Document Type: EIS-Administrative Record
Index Field: Draft EIS
Project Name: Sugar Camp Mine No. 1
Project Number: 2019-28

SUGAR CAMP ENERGY, LLC
MINE NUMBER 1 – BOUNDARY REVISION 6
DRAFT ENVIRONMENTAL IMPACT STATEMENT
Franklin and Hamilton Counties, Illinois

Prepared by:
TENNESSEE VALLEY AUTHORITY
Knoxville, Tennessee

Cooperating Agency:
U.S. ENVIRONMENTAL PROTECTION AGENCY
Chicago, Illinois

March 27, 2020

This page intentionally left blank

COVER SHEET

Sugar Camp Energy, LLC Mine No. 1 Expansion - Revision 6 EIS

Proposed action: The Tennessee Valley Authority (TVA) prepared this environmental impact statement (EIS) to analyze the potential impacts of the extraction of TVA-owned coal by underground mining methods from an area of approximately 12,125 acres. Within the Shadow Area, five 5.3-acre Bleeder Shaft Facilities would be constructed, and planned subsidence of approximately 10,549 acres would result. This EIS also analyzes connected actions associated with processing, storage, and transport of TVA-owned coal within an existing surface effects area. One new 389-acre facility, known as the East Refuse Disposal Area, would be built in association with both TVA-owned coal and privately owned coal not subject to TVA approval.

Type of document: Draft Environmental Impact Statement

Lead agency: Tennessee Valley Authority

Cooperating agency: U.S. Environmental Protection Agency

To request information, contact:
Elizabeth Smith
Tennessee Valley Authority
400 West Summit Hill Drive, WT11B
Knoxville, Tennessee 37902-1499
Phone: 865-632-3053
E-Mail: esmith14@tva.gov

Comments due date: May 26, 2020

Abstract: TVA evaluates a No Action and Action Alternative in this EIS. The Action Alternative consists of TVA approving the extraction of approximately 12,125 acres of TVA-owned coal, which would also result in the construction and operation of five Bleeder Shaft Facilities and planned subsidence above the extracted coal. Connected actions include processing, storing, and transporting the extracted coal via existing and proposed facilities. Under the No Action Alternative, the mine would continue extracting, processing, storing, and transporting previously approved TVA-owned coal and privately owned coal. The Action Alternative is preferred due to being economically feasible, having similar environmental impacts to other alternatives, and meeting the purpose and need.

This page intentionally left blank

EXECUTIVE SUMMARY

Purpose and Need for Action

TVA owns the coal reserves beneath the Project Area and executed a coal lease agreement in July 2002 with Sugar Camp Energy, LLC (Sugar Camp) to mine TVA-owned coal in Franklin, Hamilton, and Jefferson counties, Illinois. The purpose of the coal lease agreement is to facilitate the recovery of TVA-owned coal reserves in an environmentally sound manner. The Proposed Action would implement the terms of the existing coal lease agreement and recuperate TVA's investment. Under the terms of the coal lease agreement, Sugar Camp may not commence mining of TVA-owned coal reserves until completion of all environmental reviews required for compliance with applicable laws and regulations. In fulfillment of its responsibilities under the National Environmental Policy Act (NEPA), TVA has prepared this Draft Environmental Impact Statement to consider whether TVA will approve the proposed plan to extract TVA-owned coal within a 12,125-acre shadow area permitted under Significant Boundary Revision [SBR] Number [No.] 6 of Illinois Underground Coal Mine Permit No. 382 and process the TVA-owned coal at existing and proposed facilities within the surface effects area of Sugar Camp Mine No. 1.

Alternatives

In this EIS, TVA evaluates a No Action Alternative and Action Alternative. The Action Alternative would consist of TVA approving the plan to extract TVA-owned coal reserves within a 12,125-acre portion of the overall SBR No. 6 shadow area (hereafter, the Shadow Area). The Action Alternative would involve the associated construction and operation of five Bleeder Shaft Facilities in different locations within the Shadow Area, together totaling approximately 27 acres. Planned subsidence (controlled sinking of the ground at the surface) of approximately 10,549 acres within the Shadow Area would result. Connected actions include processing of the extracted TVA-owned coal at an existing Coal Preparation Plant within an existing 2,420-acre surface effects area; treatment of the byproducts at both existing facilities and one new facility, known as the East Refuse Disposal Area; surface storage of coal; and offsite transport of processed coal via an existing rail loop. These facilities also process, store, and transport privately owned coal not subject to TVA approval. Together, the 12,125-acre Shadow Area and the 2,420-acre surface effects area compose the Project Area. TVA's analysis of the Action Alternative takes into account the proposed mining plan in addition to the effects associated with ongoing mining operations.

Under the No Action Alternative, TVA assumes that Sugar Camp would continue mining approximately 25,847 acres of TVA-owned coal approved after previous NEPA reviews and privately owned coal not subject to TVA approval (hereafter, the private/TVA-approved shadow area). In addition, Sugar Camp would continue processing, storing, and transporting the previously approved TVA-owned and privately owned coal.

Affected Environment

The Sugar Camp Mine No. 1 is located in Hamilton and Franklin counties in Illinois. The regional character is mostly rural, with agricultural and pasture fields, flat terrain with rolling hills, forested areas, and generally small towns and communities.

The Project Area is located east of the City of Benton. Current land use within much of the surface effects area is heavy industrial and includes operation of existing facilities for the processing, storage and transport of coal. Within the Shadow Area, current land use is primarily rural agricultural with some scattered residences. Nine historical archaeological sites, one

Precontact period archaeological site, and three potentially historic buildings have been recorded within the Project Area or vicinity. The other buildings in the vicinity of the Project are residential and/or farmstead buildings. Five churches and three cemeteries of unknown age are present within the Shadow Area.

The Shadow Area is located in the southern portion of the Illinois Basin coalfield. The Herrin No. 6 coal seam, which is proposed to be mined, lies from 650 feet to more than 900 feet below ground. Seven named streams, Granny Creek, Carlton Branch, Web Hill Branch, Sugar Camp Creek, Campbell Branch, Sullivan Branch, Ewing Creek, and Middle Fork Big Muddy River as well as multiple unnamed tributaries and creeks flow through the Shadow Area and surface effects area. The majority of the Project Area is characterized by a heavily fragmented landscape dominated by early successional habitat, such as pastures and hayfields. Forested areas and wetlands are scattered throughout and support a variety of plants and animals.

Environmental Consequences

Coal mining activities would occur under either the No Action Alternative or the Action Alternative. The environmental consequences associated with either alternative, including the Action Alternative, would not be significant and, for the most part, would be temporary due to minimization and mitigation efforts required in Illinois Department of Natural Resources (IDNR) permit conditions.

Minor, temporary impacts to soils, groundwater, floodplains, surface waters and wetlands, vegetation, wildlife, and aquatic life would occur with either alternative. Other resources that would be temporarily affected under either alternative include prime farmland, water quality and supply, natural areas, land use, transportation, utilities, noise, and visual. These impacts would be minimized or mitigated, per IDNR permit requirements. Adoption of either alternative would not significantly affect air quality from emissions of air pollutants or greenhouse gases.

Under either alternative, permanent changes to geology would occur due to the removal of a portion of the Herrin No. 6 coal seam. Construction of the East Refuse Disposal Area, which constitutes an expansion of the existing surface effects area under either alternative, would result in permanent impacts to utilities, North Bobtail Road, wetlands, and land use. These impacts would be offset through required minimization and mitigation efforts.

Solid and hazardous waste and human health and safety impacts would be avoided due to compliance with relevant regulations and avoidance and mitigation measures under either alternative. Beneficial effects on socioeconomics would occur with either alternative. Environmental justice impacts would be avoided due to compliance with IDNR permit requirements to avoid, minimize, or mitigate the adverse effects of mining operations.

Under the Action Alternative, TVA would require appropriate consultations with the pertinent federal and state agencies to ensure impacts to cultural resources and to federally and state-listed species are avoided, minimized, or mitigated. Generally, these consultations are also required under the No Action Alternative, per IDNR permit conditions.

Table of Contents

List of Appendices

List of Tables

List of Figures

Symbols, Acronyms, and Abbreviations

APE	Area of Potential Effects
ARMPS	Analysis of Retreat Mining Pillar Stability
CBM	Coal Bed Methane
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMM	Coal Mine Methane
CO	Carbon monoxide
CPP	Coal Preparation Plant
CT	Census tract
CWA	Clean Water Act
dB	Decibel
DBA	A-Weighted Decibel
DBH	Diameter at Breast Height
DNL	Day-night Average Sound Level
EA	Environmental Assessment
EIS	Environmental Impact Statement
E.O.	Executive Order
°F	Fahrenheit
FPPA	Farmland Protection Policy Act
GHG	Greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GWP	Global Warming Potential
HAP	Hazardous Air Pollutants
HARGIS	Historic Architectural Resources GIS System
HUC	Hydrologic Unit Code
IAC	Illinois Administrative Code
IBR	Incidental Boundary Revision
IDNR	Illinois Department of Natural Resources
IDOA	Illinois Department of Agriculture
IDOT	Illinois Department of Transportation
IEM	Iowa Environmental Mesonet

IEPA	Illinois Environmental Protection Agency
IGPA	Illinois Groundwater Protection Act
IHPA	Illinois Historic Preservation Agency
IIAS	Illinois Inventory of Archaeological Sites
ILCS	Illinois Compiled Statutes
INHS	Illinois Natural History Survey
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
ISGS	Illinois State Geological Survey
LB	Pound
LRD	Land Reclamation Division
MBTA	Migratory Bird Treaty Act
MSHA	Mine Safety and Health Administration
$MTCO_2e$	Metric Tons of Carbon Dioxide Equivalent
µg	Microgram
µm	Micrometer
NA	Natural Area
NAAQS	National Ambient Air Quality Standards
NCA	National Climate Assessment
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
No.	Number
NO_2	Nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O_3	Ozone
OMM	Office of Mines and Minerals
OSHA	Occupational Safety and Health Administration
OWR	Office of Water Resources

Pb	Lead
$PM_{2.5}$	Particulate matter whose particles are less than or equal to 2.5 micrometers
PM_{10}	Particulate matter whose particles are less than or equal to 10 micrometers
PPB	Parts per billion
PPM	Parts per million
PRT	Potential Roost Tree
RBP	Rapid Bioassessment Protocol
RCRA	Resource Conservation and Recovery Act
RDA	Refuse disposal area
RFFA	Reasonably foreseeable future action
RO	Reverse osmosis
ROM	Run-of-Mine
RRA	Resource Rich Area
SBR	Significant Boundary Revision
SCC	Social Cost of Carbon
SDPS	Surface Deformation Prediction System
SEA	Supplemental Environmental Assessment
SFWA	State Fish and Wildlife Area
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMCRA	Surface Mining Control and Reclamation Act
SO_2	Sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
tpy	Tons per year
TVA	Tennessee Valley Authority
UCM	Underground Coal Mine
USACE	United States Army Corps of Engineers
USC	United States Code
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USEIA	United States Energy Information Administration
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Glossary of Terms

Bleeder ventilation shaft Part of a ventilation system that removes methane gas from mine areas. Overall, a mine ventilation system consists of entries, ventilation controls, and fans. As part of the system, bleeder shafts circulate clean air throughout the underground workings and release methane-laden air from these areas.

Coal refuse The reject material that is produced in the processing of coal. Coal naturally occurs interbedded within sedimentary deposits, and the reject material consists of varying amounts of slate, shale, sandstone, siltstone, and clay minerals, which occur within or adjacent to the coal seam, as well as some coal that is not separated during processing.

Coal reserves Large deposits of coal that have been documented by geological surveys and engineering studies, are accessible, and from which coal can be economically produced.

Coal seam A coal stratum deposit that occurs between layers of rock.

Coal shearer A machine body containing electric motors, hydraulic equipment and controls that is mounted over the Armored Face Conveyor. Horizontal cutting drums are mounted on the machine with cutting picks and rotating in a plane parallel to the side of the machine. Coal shearers are sometimes referred to as “continuous miners.”

Coal slurry Coal mining operations use water to rinse coal once extracted. Coal slurry is the water that is left over from the rinsing process and contains elevated levels of chlorides, sulfates, arsenic, lead, mercury, and selenium.

Continuous mining An underground mining technique that utilizes machinery to cut and rip coal from the coal seam and load the coal onto conveyors in a continuous operation.

Longwall mining An underground mining technique capable of extracting “panels” of coal known as “longwall panels.” A coal shearer removes a longwall panel as a single “slice,” while hydraulic jacks support the roof above and in front of the coal shearer. Once a longwall panel is extracted, the coal shearer and hydraulic jacks are advanced, and overlying rock collapses into the void behind, causing subsidence at the surface.

Longwall panel The “panel” or “slice” of coal mined during the longwall mining process. Longwall panels can measure up to approximately 1,500 feet wide and two miles long.

Planned subsidence Controlled sinking of the ground due to the extraction of coal, water, oil, natural gas, or mineral resources from underground mining, pumping, or fracking activities.

Plate testing	A load-bearing test of soil used for determining the ultimate bearing capacity of the earth's surface and the likelihood of settlement under a given load.
Refuse disposal area	A portion of land including but not limited to an impoundment or excavated portion of the earth intended as permanent disposal or long-term storage of coal refuse.
Room-and-pillar mining	An underground mining technique that extracts coal in a grid-like pattern such that portions of the coal seam are left intact to support the roof of the mine. The series of parallel areas or "rooms" from which coal is extracted are called "entries."
Sedimentation pond	A constructed pond that is sited in networks to slow the velocity of water and cause the deposition of suspended materials.
Shadow area	The geographic area in an application or permit where underground mining is proposed or approved. This area includes all resources above and below the coal that are protected by the State Act and may be adversely impacted by underground mining operations, including planned subsidence.
Slurry pond	A constructed pond or lagoon used to settle and drain the solids from coal slurry.

This page intentionally left blank

CHAPTER 1 – PURPOSE AND NEED FOR ACTION

The Tennessee Valley Authority (TVA) owns coal reserves underlying approximately 64,689 acres of land in Franklin, Hamilton, and Jefferson counties, Illinois (Figure 1-1). TVA executed a coal lease agreement with Sugar Camp Energy, LLC (Sugar Camp) in July 2002 to mine portions of the TVA coal reserves. The lease agreement facilitates the recovery of TVA-owned coal reserves in an environmentally sound manner. Under the terms of the lease agreement, Sugar Camp may not commence mining of TVA-owned coal reserves under a mining plan or any mining plan revision until completion of all environmental reviews required for compliance with applicable laws and regulations have been finalized. As part of Significant Boundary Revision (SBR) Number (No.) 6 of its Underground Coal Mine (UCM) Permit No. 382, Sugar Camp presented to TVA a mining plan to extract TVA-owned coal reserves within a 12,125-acre area in Franklin and Hamilton counties. The Proposed Action would implement the terms of the lease agreement and recuperate TVA's investment.

In fulfilling its responsibilities under the National Environmental Policy Act (NEPA), TVA has prepared this environmental impact statement (EIS) to inform TVA's decision on whether to approve Sugar Camp's proposed mining plan to extract TVA-owned coal underlying approximately 12,125 acres of land, hereafter Shadow Area, and process the TVA-owned coal at existing and proposed facilities within the surface effects area (Figure 1-1). The Shadow Area is composed of a northern and southern portion. Surface activities to support underground mining of TVA-owned coal, as well as privately owned coal, include the processing, storage, and transport of the coal at an existing Coal Preparation Plant, within an existing 2,420-acre surface effects area located between the northern and southern portions of the Shadow Area. One new 389-acre facility, known as the East Refuse Disposal Area, would be built within a 525-acre site in the existing surface effects area. The East Refuse Disposal Area would be associated with both TVA-owned and privately owned coal reserves, the mining of which is not subject to TVA approval. Together, the 12,125-acre Shadow Area and the 2,420-acre surface effects area compose the Project Area.

1.1 Background

TVA is a federal corporation and instrumentality of the United States government, created in 1933 by statute to foster the social and economic well-being of the residents of the Tennessee Valley region. As part of its diversified energy strategy, TVA completed a series of land and coal mineral acquisitions from the 1960s through the mid-1980s that resulted in the ownership of two large coal reserve blocks in the southern Illinois section of the Illinois Basin coal region.

TVA generally leases its mineral rights to private coal mining companies and receives royalties on the amount of coal recovered under lease agreements. While TVA may incidentally purchase coal from these mining companies for use at TVA fossil plants, the coal reserves extracted by the companies are generally sold on the market. In 2002, TVA leased its Illinois Basin coal reserves to Sugar Camp with the condition that any proposed mining plan must be subject to environmental review and TVA approval. The mining plan is also subject to review and approval by the State of Illinois, which has regulatory authority delegated by the Department of Interior, Office of Surface Mining Reclamation and Enforcement under the Surface Mining Control and Reclamation Act (SMCRA) of 1977.

In 2008, Sugar Camp obtained UCM Permit No. 382 from the Illinois Department of Natural Resources (IDNR), Office of Mines and Minerals (OMM), Land Reclamation Division (LRD), referenced hereafter as IDNR-OMM, for Sugar Camp Mine No. 1. UCM Permit No. 382 originally authorized underground longwall mining operations under approximately 12,103 acres in Franklin and Hamilton counties. UCM Permit No. 382 also included a surface effects area to process, store and transport the coal, where the existing Coal Preparation Plant is located. Since then, Sugar Camp has received multiple permits to expand underground longwall mining operations for Sugar Camp Mine No. 1, and TVA has prepared multiple environmental assessments (EAs) for the extraction of TVA-owned coal in these additional areas (See Figure 1-2 and Section 1.3 for further description).

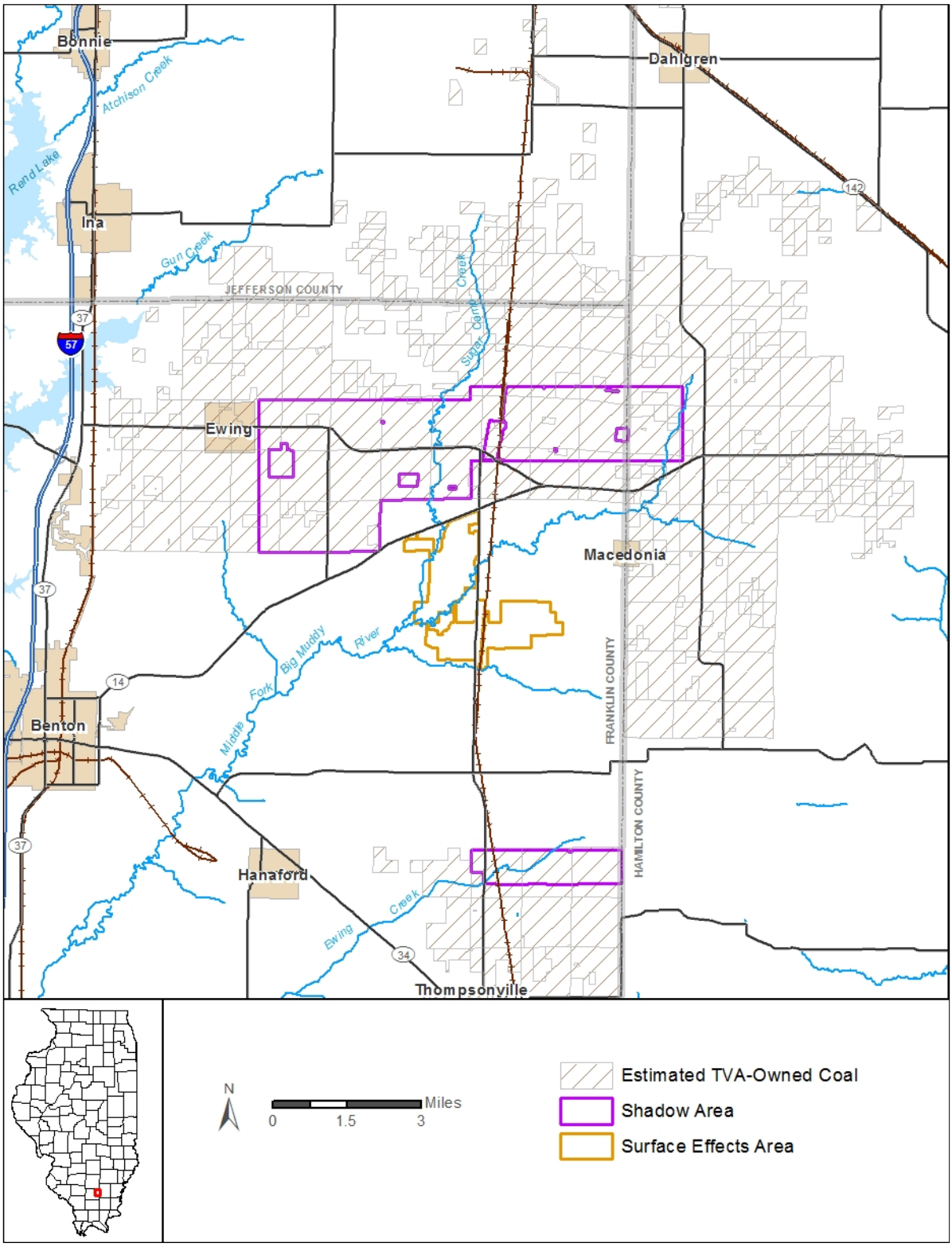


Figure 1-1. Project Location Map

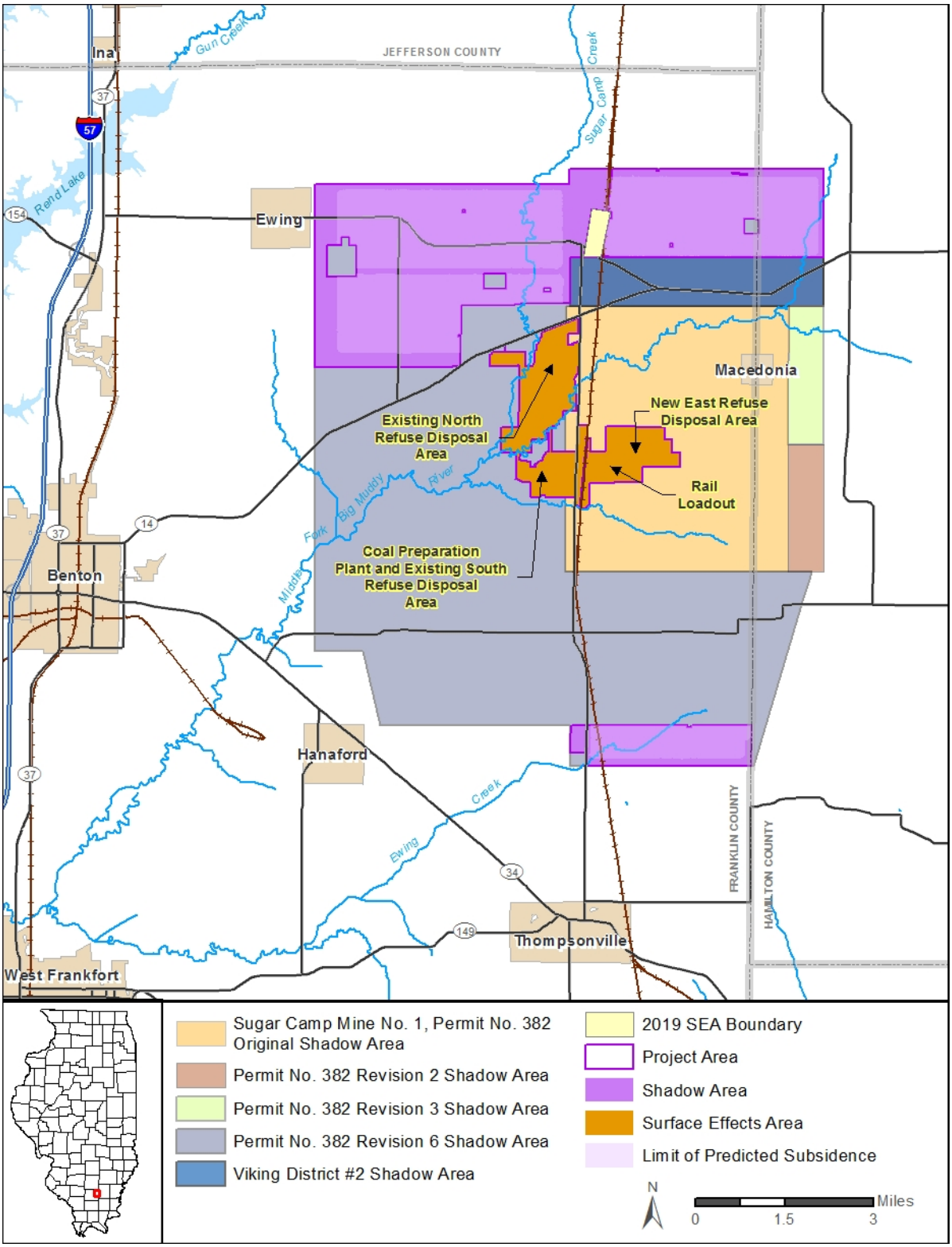


Figure 1-2. Related Environmental Reviews

1.2 Decision to be Made

In November 2017, Sugar Camp received SBR No. 6 of UCM Permit No. 382, from IDNR-OMM, for an underground mine expansion of 37,972 acres in Franklin and Hamilton counties, Illinois. TVA must determine whether or not to implement the terms of the existing coal lease agreement and approve Sugar Camp's proposal to mine approximately 12,125 acres of TVA-owned coal reserves within the Shadow Area (shown as Permit No. 382 Revision 6 Shadow Area in Figure 1-2). The coal reserves in the majority of the UCM Permit No. 382 SBR No. 6 shadow area are privately owned, and TVA has no decision or permission-granting authorities in the portions that contain privately owned coal reserves. Connected actions considered as part of the Project include the operation of existing UCM Permit No. 382 facilities for the processing, storage and transport of coal on an approximately 2,420-acre surface effects area in Franklin County.

The Sugar Camp mining plan involving TVA-owned coal includes the following activities in separate locations:

Shadow Area

- Coal Extraction and Planned Subsidence: The mining plan includes extraction of approximately 186 million tons of unprocessed ("raw") TVA-owned coal from the 12,125-acre Shadow Area over a total of 16 years scattered between 2021 and 2040. If approved, underground mining within the Shadow Area would be performed using two techniques. Coal would be extracted using room-and-pillar and continuous mining techniques during a development period, followed by longwall mining and associated planned subsidence at a later time. Planned subsidence (controlled settlement of the ground surface) of about 10,549 acres of land within the Shadow Area would occur once the coal has been removed through longwall mining methods.

- Bleeder Shaft Facilities: The mining plan includes the construction and operation of five Bleeder Shaft Facilities, each occupying about 5.3 acres, within the Shadow Area. Site-specific impacts would be evaluated by TVA prior to construction due to the exact locations of these facilities being unknown.

Surface Effects Area

- Existing Facilities: Coal processing, storage, and transportation of TVA-owned coal would utilize existing facilities permitted under UCM Permit No. 382. These occupy portions of a 2,420-acre surface effects area and currently process both previously approved TVA-owned coal and privately owned coal. This activity would contribute to existing water discharge locations from sedimentation ponds. With approval of the mining plan, an estimated 300 thousand processed tons of TVA-owned coal would be produced each year between 2021 and 2023, and approximately 7.1 million processed tons of TVA-owned coal would be produced each of the 13 years TVA coal is mined between 2024 and 2040.

- New Facilities: New surface disturbance of approximately 525 acres within the eastern portion of the 2,420-acre surface effects area for construction of the new East Refuse Disposal Area. This facility is under consideration by Sugar Camp and would be submitted to IDNR-OMM for approval upon final design. If approved by IDNR-OMM, the East Refuse Disposal Area would be built whether or not TVA

approves the Proposed Action. If constructed, the facility would be used to store refuse from the processing of TVA-owned coal.

Sugar Camp's ongoing actions also approved by SBR No. 6 (shown as Permit No. 382 Revision 6 Shadow Area in Figure 1-2) involve extraction of approximately 359 million unprocessed tons of coal within a 25,847-acre shadow area that includes both privately owned coal and TVA-owned coal approved for mining under separate environmental reviews, hereafter the private/TVA-approved shadow area. These ongoing actions involve planned subsidence within the private/TVA-approved shadow area. New surface disturbances associated with these ongoing actions consist of approximately four 5.3-acre bleeder ventilation shaft facilities within the private/TVA-approved shadow area and the 525-acre East Refuse Disposal Area discussed above. While the ongoing actions are not considered as connected actions to the currently proposed TVA-owned coal mining activities, TVA's decision takes into account the proposed mining plan in addition to the effects associated with Sugar Camp's ongoing actions. The effects of the ongoing actions along with the Proposed Action are considered in detail in the cumulative impacts section of this EIS (Section 3.14).

1.3 Related Environmental Reviews

In 2008, Sugar Camp obtained UCM Permit No. 382 from the IDNR-OMM for underground longwall mining operations under approximately 12,103 acres in Franklin and Hamilton counties. UCM Permit No. 382 also includes a surface effects area to process, store and transport the coal (a connected action to the current proposed action). Since then, Sugar Camp has received multiple permits from IDNR-OMM to expand underground longwall mining operations for Sugar Camp Mine No. 1, and TVA has prepared multiple environmental assessments (EA) and supplemental EAs (SEA) for the mining of TVA-owned coal within each expansion area. Revisions made to this permit and approved by IDNR are listed below, followed by TVA EAs and SEAs that address the mining of TVA-owned coal by Sugar Camp (see TVA 2020 for the NEPA documents listed below).

- Incidental Boundary Revision (IBR) No. 1 to UCM Permit No. 382 (2010) for 1.45 acres of land for road access on private property.

- IBR No. 2 for UCM Permit No. 382 (2010) for 17 acres of surface disturbance for bleeder ventilation shaft installation overlying TVA-owned coal.

- IBR No. 3 for UCM Permit No. 382 (2010) for a 19-acre shadow area associated with TVA-owned coal.

- SBR No. 1 to UCM Permit No. 382 (2010) for 817 acres of subsidence overlying TVA-owned coal. The boundaries of this permit include IBRs Nos. 1 - 3.

- IBR Nos. 4 and 5 to UCM Permit No. 382 for two concrete bore holes on private property.

- SBR No. 6 to UCM Permit No. 382 (2017) for an underground shadow area revision of an additional 37,972 acres to be mined with the extraction of coal in the Herrin No. 6 seam via longwall mining. The permit was granted in November when IDNR-OMM issued "Results of Review: Permanent Program Significant Revision Application No. 6 to Permit No. 382." This permanent program finding concluded that there was reasonable basis on which to issue a significant revision to UCM

Permit No. 382, as modified. The mining of TVA-owned coal under the Proposed Action is included in SBR No. 6 (IDNR 2017).

1.3.1.1 TVA Sugar Camp Mine No. 1. EA (May 2011)

This EA evaluated the potential environmental effects of Sugar Camp's proposed mining of approximately 2,600 acres of TVA-owned coal underneath the IBR No. 2 shadow area and a portion of the original 12,103-acre shadow area of the Sugar Camp Mine No. 1.

1.3.1.2 TVA Sugar Camp Mine No. 1. SEA (May 2013)

This SEA evaluated the potential environmental effects of Sugar Camp's proposed mining of TVA-owned coal underneath an additional 880 acres of the IBR No. 3 shadow area.

1.3.1.3 TVA Sugar Camp Mine No. 1 Expansion Viking District #2 EA (November 2018)

This EA evaluated the potential environmental effects of the proposed expansion along the north perimeter of its original mine perimeter, into a 2,250-acre area referred to as Viking District #2, included in SBR No. 6.

1.3.1.4 TVA Sugar Camp Mine No.1 Expansion Viking District #2 SEA (May 2019)

This SEA evaluated the potential environmental effects of the proposed expansion of mining into a 155-acre area adjacent to Viking District #2, included in SBR No. 6.

1.4 Scoping and Public Involvement

Per the IDNR-OMM permitting process, Sugar Camp advertised the Proposed Action and the private actions associated with UCM Permit No. 382 SBR No. 6 in the *Benton Evening News*, a newspaper published in the Project Area vicinity, in April 2017 to announce the permit approval. Sugar Camp also made the permit application available to the public via the Franklin and Hamilton county clerks. Copies of the application were sent to the Illinois Department of Agriculture (IDOA), Illinois Environmental Protection Agency (IEPA), U.S. Department of Agriculture (USDA) Natural Resources Conservation Service, and U.S. Fish and Wildlife Service (USFWS) for review and comment. IDOA, IEPA, and USFWS, as well as members of the public provided comments on the application, and IDNR provided responses in the IDNR's "Results of Review, Permanent Program Significant Revision Application No. 6 to Permit No. 382," also distributed to the public.

On August 12, 2019, TVA published a Notice of Intent (NOI) in the Federal Register announcing that it planned to prepare an EIS to address the potential environmental effects associated with mining 12,125 acres of TVA-owned coal in the Project Area located in Franklin and Hamilton counties, Illinois (Appendix A). The NOI initiated a 30-day public scoping period, which concluded on September 11, 2019. In the NOI, TVA solicited public input on other reasonable alternatives and environmental resources that should be considered in the EIS.

During the public scoping period, TVA received comments from the U.S. Environmental Protection Agency (USEPA), the Sierra Club, and one private citizen. USEPA commented that the EIS should consider a sufficient range of alternatives, such as alternative site configuration, mining methods, mine locations, coal resources, and sources of energy. The alternatives analysis for this EIS is described in Chapter 2. In their comments, USEPA also requested to participate in the NEPA process as a cooperating agency.

Other comments were received regarding TVA's approach to the NEPA process and several resource categories. Potential impacts to environmental resources, including the several resource categories mentioned in the comments (water resources, safety, subsidence, air quality and greenhouse gas (GHG) emissions), are evaluated in this EIS.

Pertaining to commented resource categories, the following information is included in this EIS:

- Impacts to water quality, including chloride toxicity, water quantity, and jurisdictional waters (Waters of the U.S.);
- Occupational health and safety measures, including safety related to humans and infrastructure during planned subsidence;
- Risk of subsidence, anticipated location of subsidence, predicted amount of subsidence, and potential impacts of subsidence; and
- Evaluation of GHG effects in accordance with NEPA requirements, guidance, and relevant case law and with consideration of recent climate report findings.

Based on scoping and TVA experience with similar environmental evaluations, the following potentially affected environmental resources are analyzed in this EIS:

- Geology, Soils, and Prime Farmland
- Floodplains
- Groundwater/Aquifers
- Surface Water
- Water Quality
- Water Supply
- Wetlands
- Air Quality
- GHGs
- Vegetation
- Wildlife
- Aquatic Life
- Threatened and Endangered Species
- Natural Areas
- Land Use
- Transportation
- Utilities
- Cultural Resources
- Solid and Hazardous Waste
- Safety
- Socioeconomic Conditions and Environmental Justice
- Noise and Visual Resources

1.5 Regulatory Compliance, Permits, Licenses, and Agency Coordination

Table 1-1 presents the laws and executive orders (E.O.s) relevant to the Proposed Action by environmental resource area in addition to NEPA.

Table 1-1. Laws and Executive Orders Relevant to the Proposed Action.

Environmental Resource Area	Law / Executive Order
Water Quality	Clean Water Act (33 United States Code [USC] §§ 1251-1387)
Groundwater	Safe Drinking Water Act (42 USC §§ 1996) Resource Conservation and Recovery Act (42 USC Ch. 82 § 6901 et seq.)
Air Quality and Noise	Clean Air Act (42 USC Ch. 85 § 7401 et seq.)
Wetlands and Waters	Clean Water Act E.O. 11990 – Protection of Wetlands E.O. 13778 – Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the "Waters of the United States" Rule Illinois Natural Areas Preservation Act (525 ILCS 30)
Floodplains	E.O. 11988 – Floodplain Management
Migratory Birds	E.O. 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds Migratory Bird Treaty Act (16 USC §§ 703-712)
Endangered and Threatened Species	Endangered Species Act (16 USC §§ 1531-1599) Illinois Endangered Species Protection Act (520 Illinois Compiled Statuses [ILCS] 10)
Cultural Resources	National Historic Preservation Act (NHPA; 54 USC §§ 300101 et seq.) Native American Graves Protection and Repatriation Act (25 USC Ch. 32 § 3001 et seq.) Illinois State Agency Historic Resources Preservation Act (Illinois revised statutes 1989, ch. 127, pars. 2661 et seq.) (known as: State 707) Human Skeletal Remains Protection Act (20 ILCS 3440; 17 Illinois Accessibility Code [IAC] 4170)
Environmental Justice	E.O. 12898 – Federal Actions to Address Environmental Justice in Minority and Low-Income Populations Illinois Environmental Protection Act (Chapter 415, Act 5. Title III)
Land Use	Farmland Protection Policy Act (7 USC §§ 4201-4209)
Coal Mining	Surface Mining Control and Reclamation Act (30 USC §§ 1201-1328) Illinois Surface Coal Mining Land Conservation Reclamation Act (Chapter 225, Act 720)

Environmental Resource Area	Law / Executive Order
Waste Management	Resource Conservation and Recovery Act (42 USC Ch. 82 § 6901 et seq.) Comprehensive Environmental Response, Compensation, and Liability Act (42 USC §§ 9601 et seq.) Toxic Substances Control Act (15 USC Ch. 53, Subch. I §§ 2601-2629) Emergency Planning and Community Right to Know Act (42 U.S. Code Chapter 116) Solid Waste Disposal Act (42 U.S. Code Chapter 82)
Safety	Occupational Safety and Health Act (29 U.S.C. §651 et seq. (1970)) E.O. 13045 – Protection of Children From Environmental Health Risks and Safety Risks Federal Mine Safety and Health Act (30 USC §§ 801-962)

In addition to TVA's approval, Sugar Camp must obtain permits from other state and federal agencies for its proposed mining plan. These other agencies also require completion of environmental reviews and public comment periods as part of their permit approval processes. The permits and approvals from other agencies were incorporated in the authorization of Sugar Camp's mining plan included in UCM Permit No. 382, issued by IDNR-OMM in 2008, and SBR No. 6, issued by the IDNR-OMM in 2017. A UCM permit is required to conduct underground mining activities. Underground mining activity includes the surface operations incidental to the underground area of extraction. The permit area includes support areas, facilities and roads. Permits are also required for underground exploration activities and processing plants. A coal mining permit must be renewed every five years.

1.5.1 IEPA NPDES

A National Pollutant Discharge Elimination System (NPDES) permit was issued by IEPA Bureau of Water to Sugar Camp in 2008 for point source discharge of pollutants into Middle Fork Big Muddy River, Akin Creek, and two unnamed tributaries on the private property portion of Sugar Camp Mine No. 1 in Franklin County. This NPDES permit was renewed and modified on May 24, 2016 (Appendix B).

A NPDES Permit for Construction Activities from the IEPA would be needed for all construction projects that disturb more than one acre of land. Sugar Camp would apply for an NPDES permit prior to construction of the East Refuse Disposal Area. This permit could also potentially be required prior to construction of each bleeder shaft, depending on the area of surface disturbance. TVA will review Sugar Camp's permits for the Bleeder Shaft Facilities once their locations are known.

1.5.2 IEPA Section 401 Water Quality Certification

A Clean Water Act (CWA) Section 401 Water Quality Certification is coordinated through the IEPA Bureau of Water for the discharge of fill material and dredging in Waters of the U.S., also known as jurisdictional waters, due to their regulation by the U.S. Army Corps of

Engineers (USACE). Drainage correction activities in the Shadow Area following subsidence that would involve dredging and placement of fill would require additional wetland surveys through the CWA Section 404 permitting process, described below, but a Section 401 certification would likely be granted automatically through this process.

Sugar Camp was issued a Section 401 certification by IEPA Bureau of Water in 2009 for the discharge of fill material in wetlands, Akin Creek, and Middle Fork Big Muddy River on the private property portion of Sugar Camp Mine No. 1 in Franklin County. A Section 401 certification may be needed for the discharge of fill material in jurisdictional waters associated with the East Refuse Disposal Area and the five Bleeder Shaft Facilities.

1.5.2.1 USACE Section 404 Permit

A CWA Section 404 permit is required for dredge or fill activities in Waters of the U.S., including wetlands. Section 404 permits are coordinated through USACE. Discharge of fill material and dredging in jurisdictional streams and wetlands would be necessary for the construction of the East Refuse Disposal Area within the surface effects area. Drainage correction activities in the Shadow Area that involve dredging would require additional stream and wetland surveys through the Section 404 permitting process. The exact locations of the five Bleeder Shaft Facilities are not known at this time, as the locations are largely dictated by the underground mining operations as they occur. If it is not possible to avoid jurisdictional streams and wetlands for the construction of the Bleeder Shaft Facilities, discharge of fill material to these features may be necessary and would require compliance with Section 404 of the CWA. In subsequent environmental reviews, TVA would analyze surface water impacts of siting each of the five proposed Bleeder Shaft Facilities.

1.5.3 Other IDNR Permits

IDNR permits are required for dams, for any construction within a public body of water, and for construction within floodways. These permits are coordinated by the IDNR-Office of Water Resources (OWR). Certain floodway or floodplain construction activities may be authorized by a Statewide or Regional Permit. Statewide Permit No. 8 authorizes the construction of underground pipeline and utility crossings that have insignificant impacts on floodways and floodplains under the jurisdiction of the IDNR-OWR. This permit may be required for bleeder shaft locations within floodplains. Sugar Camp has applied for an IDNR-OWR dam permit for construction and operation of the East Refuse Disposal Area.

A permit was issued by IDNR-OWR in November 2012 for the south refuse disposal area. The activity was described as fill and sediment pond excavation at Sugar Camp Mine in the Middle Fork Big Muddy River and Akin Creek floodplains. A permit was issued by IDNR-OWR in May 2015 for the north refuse disposal area.

IDNR does not regulate construction near the edge of floodplains if the obstructions would not cause a significant increase in flood levels. IDNR does not regulate construction activities in the floodways of streams draining less than ten square miles.

1.5.4 Consultation Requirements

1.5.4.1 USFWS and IDNR

Concurrence by USFWS and IDNR on the impact of the Shadow Area on federally and state-listed threatened and endangered species was obtained in August 2017. Consultation with USFWS on the construction and operation of the East Refuse Disposal Area is ongoing.

1.5.4.2 Illinois Historic Preservation Agency (IHPA)

Concurrence by IHPA (the Illinois State Historic Preservation Office) on the impact of the Proposed Action on historic properties and archaeological sites in the Project Area vicinity was previously obtained by Sugar Camp. TVA initiated consultation with IHPA regarding the TVA-owned portion of SBR No. 6 on November 7, 2019 (Appendix B). TVA coordination with IHPA is ongoing for the East Refuse Disposal Area and in regards to the overall Project effect on historic properties.

1.5.4.3 Federally Recognized Tribes

Pursuant to the NHPA Section 106, TVA initiated consultation with federally recognized Indian tribes regarding the properties that may have religious and cultural significance to them that could be affected by the Project. The tribes consulted consist of:

- Absentee Shawnee Tribe of Oklahoma
- Chippewa Cree Tribe of the Rocky Boy's Reservation
- Citizen Potawatomi Nation
- Eastern Shawnee Tribe of Oklahoma
- Forest County Potawatomi Nation
- Ho-Chunk Tribe of Wisconsin
- Kaw Nation
- Keweenaw Bay Indian Community
- Kickapoo Tribe of Kansas
- Kickapoo Tribe of Oklahoma
- Lac Vieux Desert Band of Lake Superior Chippewa Indians
- Menominee Indian Tribe of Wisconsin
- Miami Tribe of Oklahoma
- Osage Nation of Oklahoma
- Ottawa Tribe of Oklahoma
- Peoria Tribe of Indians in Oklahoma
- Pokagon Band of Potawatomi Indians
- Ponca Tribe of Nebraska
- Ponca Tribe of Oklahoma
- Prairie Band of Potawatomi Nation
- Quapaw Tribe of Oklahoma
- Red Lake Band of Chippewa Indians of Minnesota
- Sac and Fox Nation of Missouri in Kansas and Nebraska
- Sac and Fox Nation of Oklahoma
- Sac and Fox Tribe of the Mississippi in Iowa
- Shawnee Tribe
- United Keetoowah Band of Cherokee Indians
- Winnebago Tribe of Nebraska
- Wyandotte Nation

TVA initiated consultation with these tribes on November 8, 2019. To date, two responses have been received, from the Miami Tribe of Oklahoma and Osage Nation (Appendix B). The Miami Tribe of Oklahoma did not indicate any sites or places of significance or importance within the Project Area. The Osage Nation expressed interest in the area and requested continued consultation as the facilities are identified.

1.6 Environmental Impact Statement Overview

NEPA requires federal agencies to consider and study the potential environmental consequences of proposed major Federal actions on the human environment. Proposed actions, in this context, can include new and continuing activities that are conducted, financed, assisted, regulated or approved by federal agencies, as well as new or revised plans, policies or procedures. The NEPA process helps federal agencies make decisions based on an understanding of a proposed action's impacts and, if necessary, to take actions that protect, restore and enhance the environment (40 CFR 1500.1(c)). NEPA also requires that federal agencies provide opportunities for public involvement in providing comments on proposed actions prior to the Federal decision-making process.

TVA has prepared this EIS to assess the environmental impacts of the Proposed Action. The Draft EIS has been made available to interested individuals, groups, and federal, state and local agencies for their review and comment. Following the public comment period on the Draft EIS, TVA will respond to the comments received and incorporate any necessary changes into the Final EIS.

The completed Final EIS will be made available to the public as well. The Final EIS will be placed on TVA's website and notices of its availability will be sent to those who received the Draft EIS or submitted comments on the Draft EIS. TVA also will send the Final EIS to USEPA, which will publish a notice of the availability of the Final EIS in the Federal Register. TVA will then issue a Record of Decision, which will include (1) the decision; (2) the rationale for the decision; (3) alternatives that were considered; (4) the alternative that was considered environmentally preferable; and (5) associated mitigation measures and monitoring, and enforcement requirements.

TVA intends to publish the Final EIS in late 2020.

This page intentionally left blank.

CHAPTER 2 – ALTERNATIVES

2.1 Description of Alternatives

Through preliminary scoping, TVA has determined that, from the standpoint of NEPA, there are two feasible alternatives available: the No Action Alternative and the Action Alternative. TVA considered other alternatives but determined that they would not be feasible. Non-feasible alternatives are discussed in Section 2.1.3 below.

2.1.1 Alternative A – The No Action Alternative

Under the No Action Alternative, TVA would not approve the SBR No. 6 plan to mine TVA-owned coal within the Shadow Area. Although Sugar Camp has secured SBR No. 6 from IDNR-OMM for mining the proposed TVA-owned coal as well as the adjacent privately owned and previously approved TVA coal, the Action Alternative requires approval from TVA for mining the proposed TVA-owned coal. Thus, in the absence of TVA approval, Sugar Camp would be limited to privately owned coal and previously approved TVA coal located within the private/TVA-approved shadow area in expanding its underground mining operations. Under the No Action Alternative, Sugar Camp plans to produce up to 9.5 million tons per year of processed coal by 2040. This total tonnage includes a small area of TVA-owned coal that TVA previously approved for mining (see Section 1.3) and a much larger area of privately owned coal.

Specifically, Sugar Camp's ongoing activities associated with SBR No. 6 (shown as Permit No. 382 Revision 6 Shadow Area in Figure 1-2) include extraction of approximately 359 million unprocessed tons of coal within the 25,847-acre private/TVA-approved shadow area. Sugar Camp's ongoing actions also involve planned subsidence of about 22,484 acres of land within the private/TVA-approved shadow area. The ongoing actions include processing, storage and offsite transport of coal at an existing Coal Preparation Plant occupying an area of approximately 2,420 acres, described below in Section 2.1.2.1. New surface disturbances associated with the ongoing actions consist of approximately four 5.3-acre bleeder ventilation shaft facilities within the private/TVA-approved shadow area and the 525-acre East Refuse Disposal Area described in Section 2.1.2.1.

2.1.2 Alternative B – Action Alternative

Under the Action Alternative, TVA would implement the terms of the existing coal lease agreement and approve the proposed mining plan as submitted by Sugar Camp in SBR No. 6. According to the IDNR-OMM-approved plan, TVA would allow Sugar Camp to mine TVA-owned coal reserves within the 12,125-acre Shadow Area. Additional IDNR-OMM permits would be required for connected actions, such as the construction and operation of up to five Bleeder Shaft Facilities and the construction and operation of the new East Refuse Disposal Area within the surface effects area. The mining plan also includes Sugar Camp's proposed reclamation plan, which addresses restoring the Project Area to IDNR-OMM-approved post-mining land use when mining operations are concluded.

Extraction of newly proposed TVA-owned coal under SRB No. 6 would occur via room-and-pillar and continuous mining techniques during an initial three-year development period between 2021 and 2023. Longwall mining operations and associated planned subsidence would occur during a 13-year period between 2024 and 2040. While the estimated completion date for the proposed extraction of TVA-owned coal within the Shadow Area is 2040, actual mining durations would vary based on the actual annual production achieved.

Each aspect of the Action Alternative is described in the following sections.

2.1.2.1 Surface Facilities

Bleeder Shaft Facilities

The mining plan includes the construction of five Bleeder Shaft Facilities required for the proposed action. Each facility would disturb about 5.3 acres of surface lands within the 12,125-acre Shadow Area. Table 2-1 presents approximate acreages for development of each of the five 5.3-acre Bleeder Shaft Facilities (based on previously constructed bleeder shaft facilities to support the mine).

Table 2-1. Example Development of Each Bleeder Shaft Facility

Bleeder Shaft Area Development	Acres	Percent of Total Bleeder Shaft Area
Shaft Cuttings Stockpile	1.0	18.9%
Soil Stockpiles	0.5	9.4%
Surfaced Area	2.0	37.7%
Undeveloped Area	1.8	34.0%

A bleeder shaft is part of a ventilation system that removes methane gas from mine areas. A mine ventilation system consists of entries, ventilation controls, and fans. Bleeder shafts circulate clean air through the underground workings to eliminate accumulations of methane gas, and the methane-laden air is exhausted through the bleeder shaft (Figure 2-1). Fans are installed on the ventilation shaft to increase the rate of air circulation and, in turn, reduce the risk of explosions and fires.

A typical bleeder shaft facility would be located on a site containing the following elements: a concrete pad (occupying approximately 2,430 square feet of surface area and approximately four feet thick), one 16-foot diameter concrete-lined ventilation shafts, two 16-inch diameter steel-lined boreholes with concrete pads, two 12-inch diameter steel-lined utility boreholes with concrete pads, a transformer on a concrete pad, a compressor station, and a crib plant with associated facilities (see Figure 2-2). All of the shafts and boreholes would be extended approximately 970 feet deep to the subject coal seam. Two (25 feet by 25 feet by 10 feet) temporary drill pits may be used during construction to support utility boreholes. The drill sites would be covered with eight inches of crusher-run gravel.

Removal of topsoil would occur immediately following any necessary vegetation clearing for construction. Topsoil material would be removed and placed in a stockpile for future reclamation. Excavated consolidated material would be utilized for road and parking area base construction or placed in a stockpile for future reclamation. Soil storage stockpiles would be situated outside of drainage ways to minimize soil erosion. Sugar Camp would seed these stockpiles with grasses, legumes, and small grain cover crops to minimize susceptibility to excessive water and wind erosion.

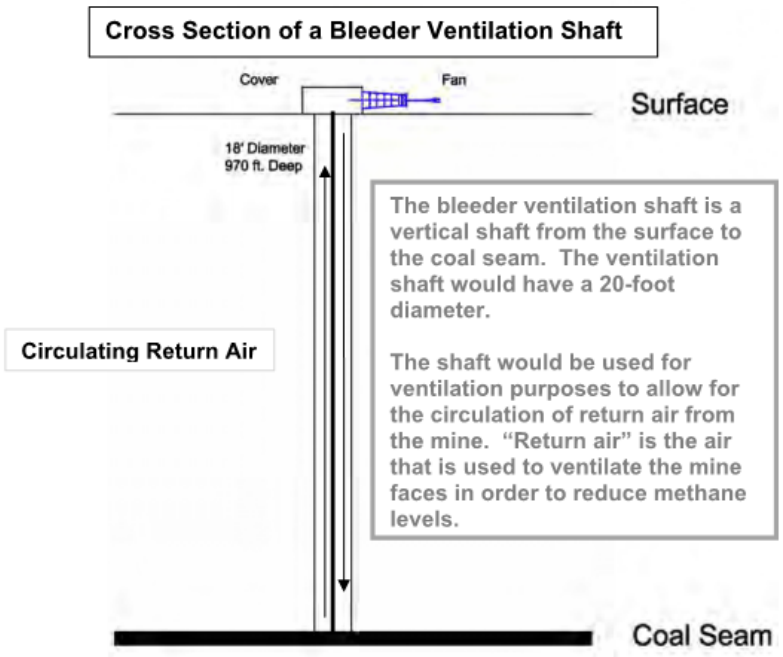


Figure 2-1. Diagram of Representative Ventilation Bleeder Shaft for Typical Sugar Camp Mine No. 1 Operations

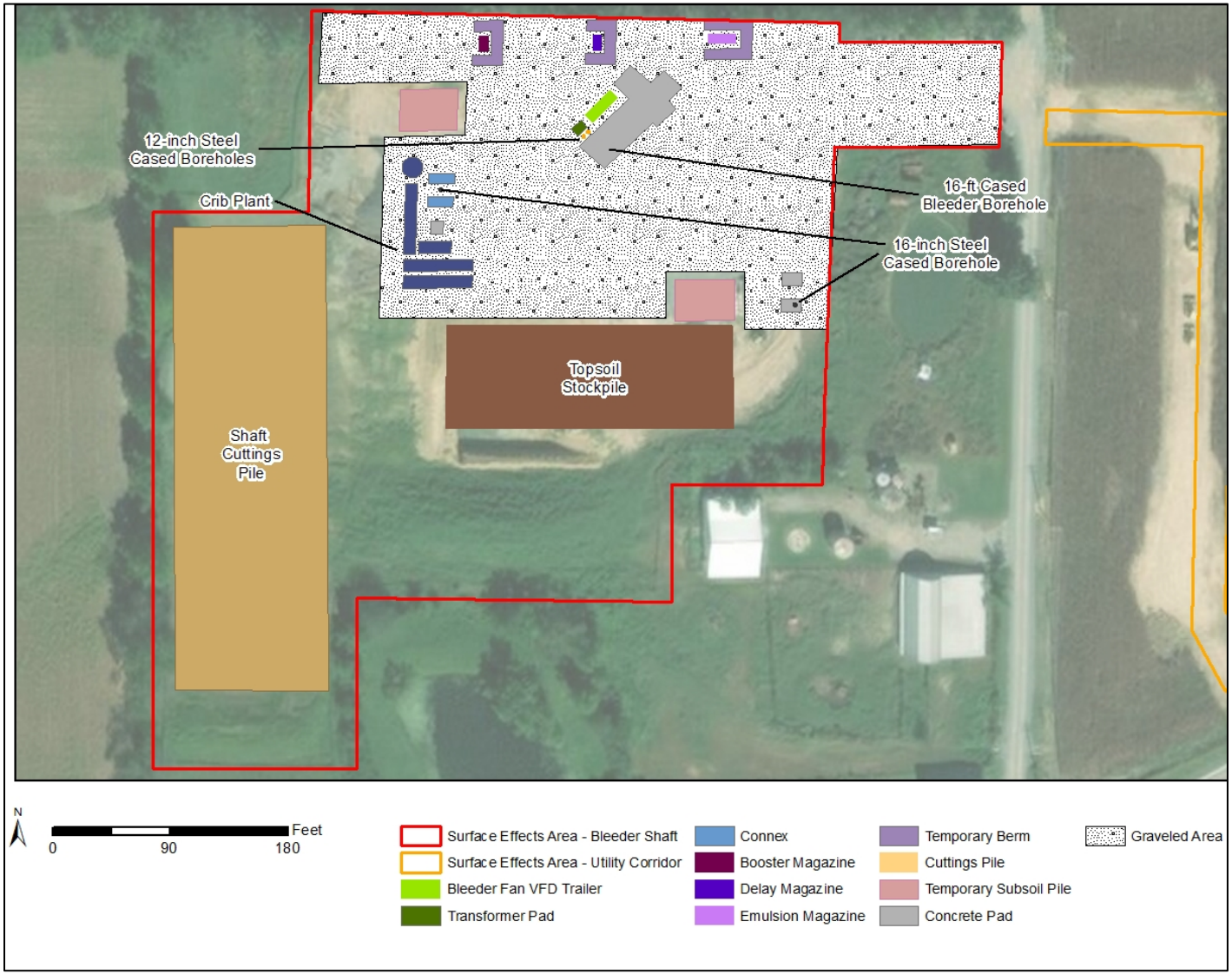


Figure 2-2. Representative Bleeder Shaft Facility (Viking District #2)

Coal Preparation Plant

The extracted coal, both TVA-owned and privately owned, would be processed at an existing Coal Preparation Plant located within the 2,420-acre surface effects area, on privately owned lands and outside of the 12,125-acre Shadow Area. The currently operating plant was approved by IDNR in 2008 and did not require TVA approval. Water used at the plant is treated on-site. Sugar Camp holds an NPDES permit to discharge water from 14 locations outside of the Shadow Area (Appendix B). Use of the existing Coal Preparation Plant for the Action Alternative would not result in any new surface facilities.

East Refuse Disposal Area

Sugar Camp proposes to construct a new refuse disposal area, referred to herein as the East Refuse Disposal Area, for the long-term storage of refuse from the existing Coal Preparation Plant. The East Refuse Disposal Area would occupy a footprint of approximately 389 acres within a 525-acre site where construction activities would occur. If approved by IDNR-OMM, the East Refuse Disposal Area would be constructed with or without TVA approval in order to process the privately-owned coal already approved for mining by IDNR-OMM. Thus, the East Refuse Disposal Area would be constructed under the No Action Alternative. If the Action Alternative is approved by TVA, the East Refuse Disposal Area would also be used for the storage of refuse from the preparation of the TVA-owned coal.

The East Refuse Disposal Area would be built using a downstream construction method, and the coarse coal refuse embankment would be constructed from the fine coal slurry cells outward. A total of four stages are proposed to be constructed within the East Refuse Disposal Area. Final grading of the East Refuse Disposal Area site would occur after the outslopes are at the approved grade and terraces are at the approved elevation. Agricultural lime or an approved material would be applied at the completion of the grading operation and prior to placing root medium soil material on the outslopes. After the root medium has been graded to the required thickness, topsoil material would be placed on the slopes. A total of four feet of soil cover would cover the refuse outslopes. Since the proposed East Refuse Disposal Area would occupy a 389-acre footprint, the reclamation process would be completed in sections until the outslopes have been covered in root medium and topsoil.

As each section of the refuse outslope is completed, the area would be seeded with the approved temporary seed mixture to minimize the potential for wind and water erosion. During the first favorable season, the approved cool season permanent seed mixture would be applied to the reclaimed outslopes. During the reclamation process of the outslopes, the coarse refuse cap would be constructed. Coarse coal refuse would be disposed of in the fine coal slurry cells and would “bridge” the cells to eliminate the impounding capacity. To supplement the compacted coarse refuse cap, the first foot of soil would be compacted to insure that the migration of rainfall would not enter the covered fine coal refuse cells. After the root medium is graded to the required thickness, topsoil material would be placed and graded. Revegetation of the cap would follow the same procedure as the outslopes, except the approved warm season permanent seed mixture would be applied.

Sugar Camp would be responsible for the operation, inspection and maintenance of the East Refuse Disposal Area. This structure would be inspected at least annually. The structure would also be inspected immediately after any major storm or any earthquake. If

the inspection team finds any significant problems developing, the engineer will have Sugar Camp arrange for correction of the problem.

2.1.2.2 Coal Extraction and Planned Subsidence

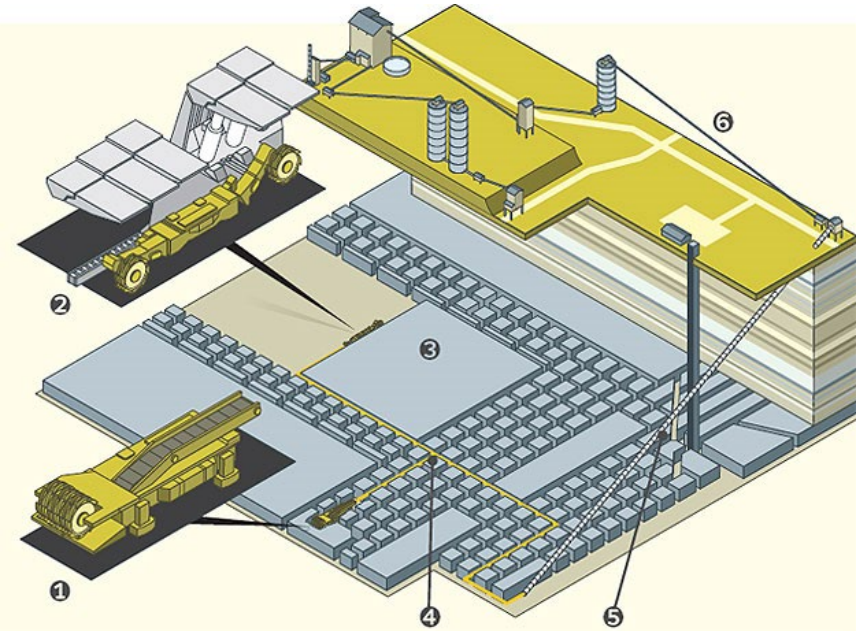
Approximately 60 percent of the coal mined in the world is extracted by underground mining methods. Two primary types of underground mining methods are room-and-pillar and longwall mining. Sugar Camp proposes both methods for mining portions of the Herrin No. 6 coal seam in the SBR No. 6 shadow area.

Room-and-pillar mining involves the extraction of coal in a grid-like pattern such that portions of the coal seam are left intact to support the roof of the mine. The series of parallel areas in which coal is extracted are called entries. Room-and-pillar mining would be completed to develop main entries for the longwall portions of the mine and for certain other areas that would not be longwall mined. For areas to be mined by the room-and-pillar method, entry and cross cut spacing would typically be on 120-foot centers, with an entry and crosscut width of 20 feet maximum. The referenced dimensions for conventional mining are based on site-specific strength values for coal pillars and floor for an adequate factor of safety for roof stability and to prevent unplanned subsidence. Plate testing would be conducted in conventional room-and-pillar sections within the first 1,000 feet of entering the area. Should any changes in mine stability or conditions be encountered, a more detailed study of floor, roof and pillars would be performed at that time. The entryways provide access for workers, ventilation, and mining equipment. Room-and-pillar equipment includes continuous miners, shuttlecars, conveyor belts, and roofbolters. The coal would be transported by conveyor from the Project Area to the existing Coal Preparation Plant. If approved, room-and-pillar mining would be expected to begin by the end of 2020.

Longwall mining involves the full extraction of coal from a section of the seam or face using mechanical shearers (Figure 2-3). Longwall mining creates an almost complete extraction of the coal reserve, which allows the overburden to subside (sink) in a controlled and predictable manner. The area of mining within this planned subsidence is defined as a longwall panel. The dimensions of longwall panels vary but may be 1,400 feet wide and up to 20,000 feet long. The longwall process results in a planned subsidence of surface areas within the Shadow Area. Walls consisting of standing coal pillars separate the panels and support the roof as well as providing access between panels. Longwall mining machinery includes hydraulic roof supports (shields), a conveyor system, and a coal shearer. A cut of the longwall panel is made by the shearer and is transported by the conveyor system. The shields are advanced as the shearer cuts the coal to allow for a safe workspace for the mine workers. The removal of coal sequentially allows the overburden to fill the void with a resultant movement of the surface. This collapse results in a subsidence on the surface. This movement is predictable, uniform, and minimizes damage to surface structures as mining progresses.

Consistent with the requirements given in 30 § CFR 817.121 of SMCRA, Sugar Camp must promptly repair or compensate the owner for material damage resulting from subsidence caused to any structure or facility that existed at the time of the coal extraction under or adjacent to the materially damaged structure. In addition, Sugar Camp must correct any material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses which it was capable of supporting before subsidence damage. These are herein referred to as IDNR-OMM-approved post-mining conditions.

The extraction of TVA-owned coal reserves under the Action Alternative is proposed to begin in late 2020 and would occur over an estimated 16-year period until 2040 and would produce approximately 92.8 million tons of processed TVA-owned coal. According to the mining plan, 14 longwall panels of TVA-owned coal would be mined during mining operations. Extraction height would be approximately 7.7 feet, and the total percentage of coal to be removed in the longwall extraction areas would be 90 percent. An average of approximately 7.1 million processed tons of TVA-owned coal would be produced during each of the 13 years of longwall extraction of TVA coal. Figure 2-4 outlines the location of the panels and underground workings in the mining plan. Updates to the mining plan and schedule would be included in the annual underground workings map submitted to IDNR-OMM.



1- Continuous Mining Equipment
2- Longwall Shear
3- Longwall Panel
4- Conveyor Belt
5- Mine Slope
6- Surface Features

Image Source: Popular Mechanics

Figure 2-3. Typical Longwall Mine Layout

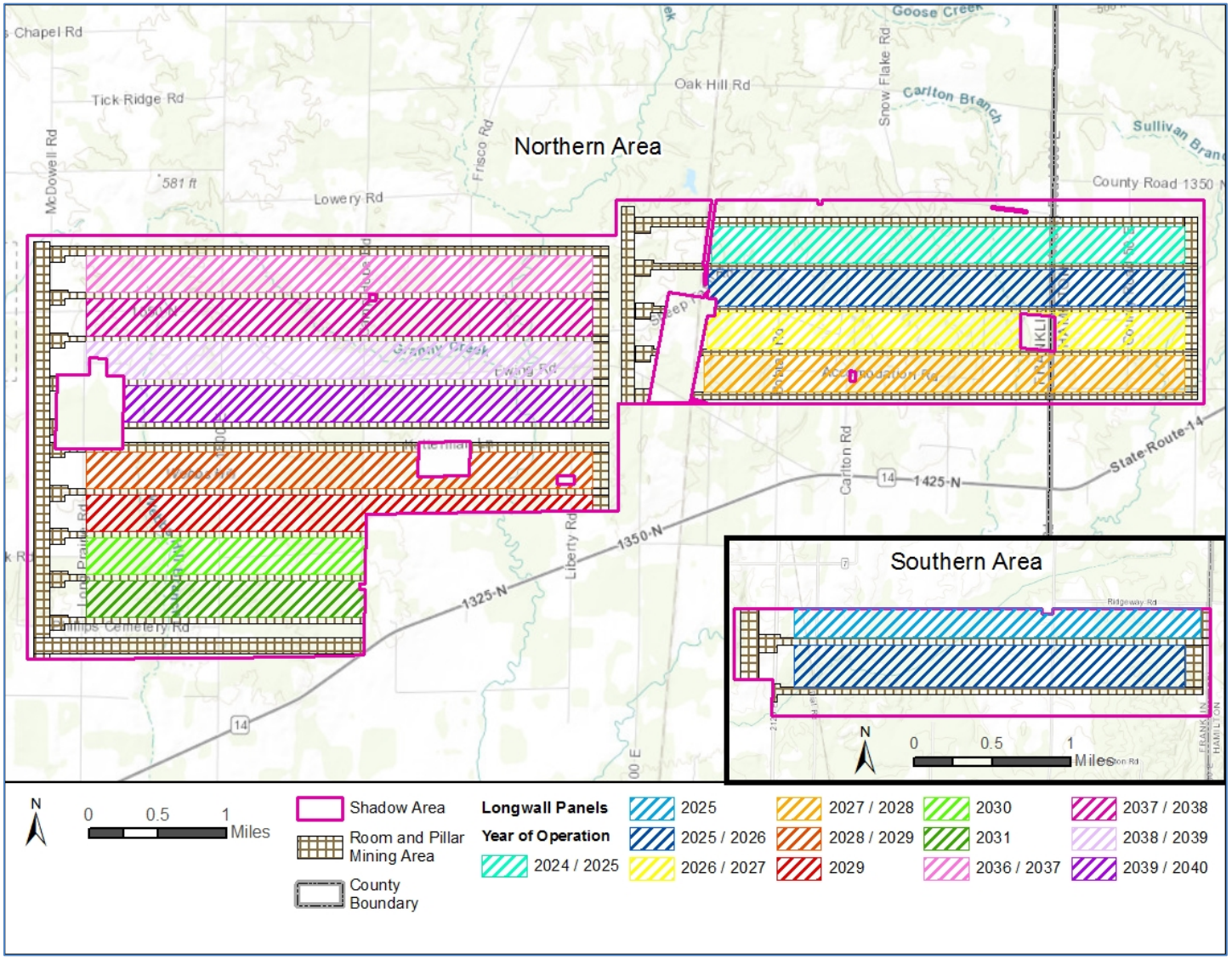


Figure 2-4. Location of Underground Panels and Proposed Years of Operations for Mining TVA-owned Coal

Within the 12,125-acre Shadow Area, an estimated 10,549 acres of surface lands would subside with a predicted maximum subsidence of up to five and a half feet. Table 2-2 describes the details of areas proposed for underground mining. The portion of the Shadow Area that would not subside allows for equipment and necessary underground workings space. For longwall mining, continuous miner units are used to drive the entryways around the perimeter of the defined longwall panels. These non-subsided entryways provide access for workers, ventilation, and mining equipment. No subsidence is anticipated above the entryways since the percent extraction is small and only allows for worker and equipment access.

Table 2-2. Description of Proposed Underground Mining Activity by Area

Planned Subsidence		
Classification	**Acres**	**Percent (%) of TVA Shadow Area**
Shadow Area projected to subside (Longwall Panels)	10,549	87%
Shadow Area not projected to subside (room-and-pillar or non-mining areas)	1,576	13%
Total Shadow Area	12,125	100%

2.1.2.3 Reclamation

The UCM permit application requires detailed restoration plans for surface effects and subsided areas. Many components of mining operations would be decommissioned and their sites, restored as their operational life comes to an end. This includes components such as refuse disposal areas and bleeder shaft facilities. The timeframes and limits established in 62 Illinois Administrative Code 1817.01 and 1817.113 govern the reclamation activities. If variances or extensions are necessary, timely requests would be made to IDNR-OMM for approval. While actual mining durations can vary, Sugar Camp estimates that final reclamation for Sugar Camp Mine No. 1 would begin in 2040. The post-mining land use for the Project Area is included in Sugar Camp's reclamation plan, which addresses restoring the Project Area to IDNR-OMM-approved post-mining conditions when mining operations are concluded.

Sugar Camp would backfill and seal all mine openings associated with SBR No. 6 coal extraction, such as bleeder shaft and boreholes, in accordance with pertinent state and federal regulations. The boreholes would be permanently sealed within 60 days of inactivity. The bleeder shaft and any boreholes would be plugged from top to bottom according to all Mine Safety and Health Administration (MSHA) and IDNR-OMM regulatory standards after they are no longer needed. Steel casings would be cut off five feet below ground and the void filled with subsoil, and then covered with topsoil, mulched, and seeded. Shaft holes would be filled with stockpile shaft material/rip rap and capped with concrete at least one foot thick. All utility boreholes would be plugged and filled with neat cement. The shaft would be surveyed, and the appropriate courthouse would be notified as required by Operator Memorandum 00-01.

All rough grading would be completed within 180 days following the removal of all facilities, except the refuse disposal areas (the reclamation for which is described below). Final

grading, including root medium placement, topsoil placement, and temporary crop cover, would be completed within 12 months of the cessation of the active mining operation. Upon completion of reclamation and the first normal period for favorable planting or farming conditions, pasture land would be seeded and returned to its pre-mine condition. Topsoil would be distributed over the site evenly. Sugar Camp would accomplish backfilling and re-grading procedures by using scrapers, dozers, loaders, and/or trucks to grade the disturbed areas and to re-distribute the stored subsoil and topsoil. Soil materials required for the reclamation effort would be obtained from stockpiled native soils removed prior to disturbance by the mining operations. Topsoil and subsoil would be redistributed throughout the permitted area using a method that would allow for proper soil depth placement and minimize soil compaction. The minimization of soil compaction would allow for a better root medium and promote plant growth. In the surface effects area, topsoil depth would be the approximate thickness of pre-mining conditions, as approved by IDNR-OMM.

All the areas affected by the installation of surface facilities (except the refuse disposal areas) would be final-graded in accordance with the approved IDNR-OMM reclamation plan. In areas adjacent to undisturbed areas, re-grading would be blended with the adjacent undisturbed grades. Methods to deter erosion of the reclaimed area would include but not be limited to the use of terraces, ditches, hay bales, silt fence, vegetation, erosion control matting, and/or riprap.

Soil replacement and vegetation establishment are dictated by seasonal weather conditions. Soil replacement would generally be accomplished during the drier months of the year to avoid undesirable compaction. Grading and construction and the removal or renovation of water and erosion control structures would likely occur between April 1 and November 15, as this is a typical growing season and would result in the best opportunity to control runoff. This time schedule would allow for revegetation and mulching of the disturbed areas. Unforeseen situations may require that temporary erosion control structures be constructed during adverse weather conditions. If this should occur, a temporary vegetation seed mixture would be used until the area can be seeded with a permanent seed mixture. The same time schedule of April 1 through November 15 would be used for the removal and/or renovation of anthropogenic structures. Prior to this type of work being conducted, approval would be obtained from the appropriate regulatory agencies. The particular agencies involved would be dictated by the location of work and particular resource in need of protection but may include IDNR, IEPA, USFWS, the Illinois Historic Preservation Agency (IHPA), and USACE. The work would be performed in accordance with accepted engineering and conservation practices. Upon completion of grading activities, the reclaimed areas would be stabilized using cover crops, as stated below, and/or by applying mulch. The approved species would then be seeded to provide vegetative cover in accordance with the post-mining land use.

Due to acting as storage features, the existing and proposed refuse disposal areas would be abandoned by filling in the reservoir areas (i.e., the impoundments) with coarse refuse (or other suitable material) to capacity. In conjunction with the abandonment, all outlet pipes would be filled with grout once the impounding capability has been removed. Soil materials would be placed as a cap over the entire embankment and slurry pond. These materials would be graded to provide adequate drainage over the entire portion of the Project Area that has been impacted by refuse placement, and these areas would be seeded and mulched. Unless an alternate soil thickness is approved by the IDNR, the cover would consist of at least four feet of soil material over all refuse areas. Ditches and other auxiliary drainage features would be maintained to provide drainage.

In accordance with its IDNR mining permit, Sugar Camp would restore the original drainage conditions and correct any damage that may have been caused by subsidence (e.g., cracks in building foundations, road surfaces, or ponding of water from subsided streams). Drainage restoration may be accomplished through stream-dredging activities, which are subject to requirements under state law, and Sections 401 and 404 of CWA. The goal of the drainage restoration is to return the land to the baseline conditions that existed prior to the start of coal recovery.

Longwall mining results in predictable and uniform subsidence patterns. Pre-subsidence contours have been documented by aerial mapping. This mapping provides a basis to determine the extent of subsidence to the lands. Any impacts that may impair the value or use of the lands would be mitigated to ensure the land reaches a condition capable of maintaining the value and reasonable foreseeable uses that the land was capable of supporting prior to subsidence. Primary methods would include restoration of drainage by small cut and fill operations and filling of cracks that do not close on their own with soil or limestone materials.

A pre-subsidence survey of structures, such as buildings and bridges, would be conducted by a trained and experience person prior to subsidence occurring. This survey would include photographic and sketched documentation of the pre-subsidence condition of the structures. A report would be generated including a description of the structure, including photographs and documentation of the physical condition of the structure. A copy would be provided to the property owner and any comments to the survey would be addressed. If a property owner decided to take a waiver and release Sugar Camp for any subsidence damages to their structures, then a pre-subsidence survey for that particular property is not completed and no future follow-up on that property is necessary.

After subsidence has occurred, a post-subsidence survey would be performed in the same manner and procedures as the pre-subsidence survey. Any changes to the structures due to subsidence would be noted and will provide a basis to determine the extent of material damage. Damages would be compensated either by providing property owners the pre-mining value of the structure, repairing the structure to pre-mining conditions, or providing property owners with the difference between the pre-mining and post-mining value of the structure.

2.1.3 Alternatives Considered but Eliminated From Further Discussion

The following alternatives have been considered but eliminated from further discussion:

Alternative site configuration or shadow area locations. During scoping, TVA received a comment that this EIS should include alternatives with differing site configurations or mine locations. TVA considered such alternative(s) but determined that they were not feasible and were unlikely to result in reduced environmental impacts. The SBR No. 6 mining plan has been designed to allow the most efficient and economical extraction of coal within the coal reserve while taking advantage of the proximity of existing infrastructure to process, store and transport the coal offsite. Shifting the shadow area to the east is not feasible due to the presence of a natural gas pipeline and relocating the pipeline or mining under it would not be cost effective. The magnitude of most of the environmental impacts are directly related to the quantity of coal mined and, assuming the existing coal preparation would be used for a reconfigured mine, the environmental impacts would be similar. A major relocation of the shadow area could also require the construction of a new coal preparation plant, likely resulting in greater overall environmental impacts. Shifting the

shadow area to the north, west, or south, while possible, offers no environmental or economical advantage over the current plan.

Selling the TVA mineral rights. During scoping, a commenter suggested that TVA consider selling its mineral reserves as an alternative to approving the mining of the coal by Sugar Camp. Selling the TVA mineral rights would likely not result in a reduction of the environmental impacts of the Action Alternative because the coal would likely be mined by the purchaser. Thus, this alternative would not address any unresolved conflicts concerning uses of available resources.

Utilizing different mining methods. Longwall mining, in combination with limited room-and-pillar mining to access the longwall panels, is the most efficient and cost-effective method to mine coal in seams such as the Herrin No. 6 seam in the Project Area. According to the U.S. Energy Information Administration's 2018 Annual Coal Report, an average of 4.7 tons per man hour are produced by continuous mining techniques in the Illinois Basin, while the longwall mining method produces an average of 11.1 tons per man hour. Longwall mines in the Illinois Basin operated by Foresight Energy, LLC, the parent company of Sugar Camp, have produced 16 to 17 tons per man hour. Longwall mining results in more complete recovery of coal and, aside from the short-term impacts of subsidence, which are mitigated through IDNR-OMM-required measures, results in environmental impacts that are similar to those of other underground mining techniques. The use of different mining methods is not economically and would not meet the purpose and need for TVA or Sugar Camp. For these reasons, alternatives utilizing different mining methods were rejected from further consideration.

2.2 Comparison of Alternatives

Under the No Action Alternative, TVA would not approve the SBR No. 6 plan to mine TVA-owned coal reserves located in the Shadow Area. Thus, no potential environmental effects related to Proposed Action would be anticipated. The 25,847-acre shadow area associated with privately owned coal and previously approved TVA-owned coal (i.e., the remaining portion of the SBR No. 6 shadow area) would be mined without the mining of additional TVA-owned coal. Surface and underground disturbances associated with the private and TVA-approved coal would occur. After mining is complete, the private/TVA-approved shadow area would be restored to IDNR-OMM-approved post-mining conditions.

Under the Action Alternative, TVA would approve the SBR No. 6 plan to mine TVA-owned coal reserves located in the 12,125-acre Shadow Area, and TVA-owned coal resources within the Shadow Area would be extracted by Sugar Camp. Surface and underground disturbances would occur. After mining is complete, the Project Area would be restored to IDNR-OMM-approved post-mining conditions.

Under both the No Action and Action Alternative, construction of the East Refuse Disposal Area would occur. Each alternative would also include construction and operations of several 5.3-acre bleeder shaft facilities; however, these facilities would be constructed in differing shadow areas. The primary distinction between the No Action Alternative and the Action Alternative is the location of the associated shadow areas within the SBR No. 6 permitted area and the estimated acreage of planned subsidence based on the overall shadow area acreage.

Table 2-3 lists potential impacts associated with the Action Alternative.

Table 2-3. Summary and Comparison of Alternatives by Resource Area

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Geology and Soils	No direct or indirect impacts to geology or soils would occur in association with the Proposed Action. Temporary impacts to soils and prime farmland due to planned subsidence in the private/TVA-approved shadow area and surface disturbances. Temporary impacts to soils in the new East Refuse Disposal Area, until the area is capped. Permanent effects to prime farmland in this location due to only being suitable for pasture land and not agricultural fields following the No Action Alternative. Permanent change to the geology of the project area due to removal of approximately 9.6 percent of the Herrin No. 6 coal seam.	Temporary impacts to soils and prime farmland due to planned subsidence in the Shadow Area and surface disturbances. Temporary impacts to soils in the new East Refuse Disposal Area, until the area is capped. Permanent effects to prime farmland in this location due to only being suitable for pasture land and not agricultural fields following the Project. Permanent change to the geology of the Project Area due to removal of approximately 4.5 percent of the Herrin No. 6 coal seam. Cumulatively, due to the overall 37,972-acre SBR No. 6 mine expansion, permanent removal of approximately 14.1 percent of the Herrin No. 6 coal seam would occur. Permanent, cumulative effects to prime farmland due to existing and proposed refuse disposal areas would potentially impact approximately 3,600 acres in Franklin County, affecting approximately 2.1 percent of farmland in Franklin County and approximately 0.01 percent of farmland across the state.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Groundwater/Aquifers	No direct or indirect impacts to groundwater would occur in association with the Proposed Action. Minor and insignificant impacts to groundwater from the surface disturbances associated with private and TVA-approved coal. Temporary, short-term groundwater quantity impacts in the 22,484-acre subsidence area associated with the private/TVA-approved shadow area.	Minor, insignificant impacts to groundwater from the surface disturbances. Temporary, short-term groundwater quantity impacts in the 10,549-acre subsidence area associated with the Shadow Area. Cumulatively, short-term groundwater quantity impacts would occur in the 33,033-acre subsidence area associated with the overall 37,972-acre SBR No. 6 expansion area and proposed actions in the existing 2,420-acre surface effects area. However, significant impacts to groundwater would not occur due to implementation of the groundwater monitoring program and the reclamation plan.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Surface Waters and Wetlands	No direct or indirect impacts to surface water and wetlands would occur in association with the Proposed Action. Bleeder Shaft Facilities would be located to avoid Waters of the U.S. to the maximum extent practicable. Potential to impact 27,806 linear feet of ephemeral and intermittent streams, 1.4 acres of wetlands, and one pond totaling 0.2 acres for construction of the new East Refuse Disposal Area. Impacts would be long term, but minor because of required mitigation. Temporary, minor impacts could occur to surface waters and wetlands as a result of subsidence of approximately 22,484 acres.	Bleeder Shaft Facilities would be located to avoid Waters of the U.S. to the maximum extent practicable. As under the No Action Alternative, the potential to impact 27,806 linear feet of ephemeral and intermittent streams, 1.4 acres of wetlands, and one pond totaling 0.2 acres for construction of the new East Refuse Disposal Area. Impacts would be long term, but minor because of required mitigation. Temporary, minor impacts could occur to surface waters and wetlands as a result of subsidence of approximately 10,549 acres. Cumulatively, minor temporary impacts could occur in the in the 33,033-acre subsidence area associated with the overall 37,972-acre SBR No. 6 expansion area. No significant cumulative impacts in association with the mine expansion or proposed actions in the existing 2,420-acre surface effects area are anticipated due to avoidance of surface water and wetlands to the maximum extent practicable. Any impacts to Waters of the U.S. would be subject to USACE 404 permits and IEPA 401 Water Quality Certifications and would be mitigated as required by these permits.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Floodplains	No direct or indirect impacts to floodplains would occur in association with the Proposed Action. Potential impacts due to construction of the Bleeder Shaft Facilities in the Shadow Area would be avoided or mitigated. No impacts to floodplains would occur due to construction of the East Refuse Disposal Area. Temporary impacts to floodplains could occur in the approximate 22,484-acre area to be subsided.	Potential impacts due to construction of the Bleeder Shaft Facilities in the Shadow Area would be avoided or mitigated. No impacts to floodplains would occur due to construction of the East Refuse Disposal Area. Temporary impacts to floodplains could occur in the approximate 10,549-acre area to be subsided. Cumulatively, a total of 6,555 acres of floodplains could experience a temporary increase in flood depth due to planned subsidence of 33,033 acres due to the overall 37,972-acre SBR No. 6 mine expansion. However, significant impacts to floodplains would not occur due to the application of the Floodplains No Practicable Alternative analysis and avoidance and minimization measures.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Water Quality	No direct or indirect impacts to water quality would occur in association with the Proposed Action. Temporary, insignificant effects to surface water quality due to coal extraction-related effects within the 25,847-acre private/TVA-approved shadow area and surface disturbances. Impacts would be minimized with the implementation of sediment and erosion control best management practices (BMPs), as required by the NPDES permit, by groundwater seepage controls associated with the East Refuse Disposal Area, and through the IDNR-OMM-required water quality monitoring programs.	Temporary, insignificant effects to surface water quality due to surface disturbances and coal extraction-related effects within the 12,125-acre Shadow Area. Impacts would be minimized with the implementation of sediment and erosion control best management practices (BMPs), as required by the NPDES permit, by groundwater seepage controls associated with the East Refuse Disposal Area, and through the IDNR-OMM-required water quality monitoring programs. Cumulatively, significant impacts to water quality due to the overall 37,972-acre SBR No. 6 mine expansion and ongoing and proposed actions in the existing 2,420-acre surface effects area would be avoided by implementation of groundwater monitoring, water quality sampling, and the reclamation plan.
Water Supply	No direct or indirect impacts to water supply would occur in association with the Proposed Action. Temporary, minor impacts to water supply in the private/TVA-approved shadow area. Any decrease in water supply would be remediated by Sugar Camp.	Temporary, minor impacts to water supply in the Shadow Area. Any decrease in water supply would be remediated by Sugar Camp. There are 115 wells or cisterns that are used for household or drinking purposes within the 33,033-acre planned subsidence area associated with the overall 37,972-acre SBR No. 6 expansion area. However, no cumulative impacts are expected due to IDNR-OMM-required groundwater monitoring and remediation of any decreases in water supply.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Air Quality	No direct or indirect impacts to air quality would occur in association with the Proposed Action. Direct and indirect emissions of air pollutants from ongoing mining of previously approved TVA-owned coal and privately owned coal. Emissions of air pollutants associated with ongoing mining operations are anticipated to be negligible. With consideration to cumulative effects, emissions of air pollutants would be less under the No Action Alternative than under the proposed Action Alternative.	Emissions of air pollutants associated with operation of the equipment associated with the mining of additional TVA-owned coal are anticipated to be negligible. Emissions of air pollutants associated with the Action Alternative would result in immeasurably small impacts on air quality. Cumulatively, direct and indirect emissions of each criteria pollutant and select hazardous air pollutants (HAPs) due to the overall 37,972-acre SBR No. 6 mine expansion is estimated to be between 0.004 percent and 1.1 percent of the total U.S. emissions of these pollutants in 2014.
Greenhouse Gases	No direct or indirect greenhouse gas emissions would occur in association with the Proposed Action. Direct and indirect emissions of GHGs from ongoing mining of previously approved TVA-owned coal and privately owned coal. GHG emissions associated with operation of the equipment are anticipated to be negligible. With consideration to cumulative effects, GHG emissions would be less under the No Action Alternative than under the proposed Action Alternative.	The total direct and indirect GHG emissions associated with the Action Alternative represents approximately 0.54 percent of total U.S. GHG emissions for 2017 and 0.07 percent of total global GHG emissions. Cumulatively, emissions of GHGs from mining associated with the overall 37,972-acre SBR No. 6 mine expansion would total about 660 million metric tons of CO_2e.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Vegetation	No direct or indirect impacts to vegetation would occur in association with the Proposed Action. Temporary impacts to existing plant communities at the locations of the four anticipated bleeder shaft facilities and the East Refuse Disposal Area, but these areas would be reclaimed or capped with soils and seeded following their operational lives. Impacts to vegetation as a result of subsidence of approximately 22,484 acres are not anticipated to occur.	Temporary impacts to existing plant communities at the locations of the five Bleeder Shaft Facilities and the East Refuse Disposal Area, but these areas would be reclaimed or capped with soils and seeded following their operational lives. Impacts to vegetation as a result of subsidence of approximately 10,549 acres are not anticipated to occur. Cumulatively, no adverse impacts to vegetation are anticipated to result from the overall 37,972-acre SBR No. 6 mine expansion or ongoing and proposed actions in the existing 2,420-acre surface effects area due to IDNR-OMM-required mitigation measures.
Wildlife	No direct or indirect impacts to wildlife would occur in association with the Proposed Action. Temporary impacts to wildlife at the locations of the four bleeder shaft facilities and the East Refuse Disposal Area. However, impacts to wildlife would be subject to mitigation under Sugar Camp's integrated fish and wildlife reclamation plan and would thus be minimized or mitigated. The Project would continue to comply with the Migratory Bird Treaty Act and E.O. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds.	Temporary impacts to wildlife at the locations of the five Bleeder Shaft Facilities and the East Refuse Disposal Area. However, impacts to wildlife would be subject to mitigation under Sugar Camp's integrated fish and wildlife reclamation plan and would thus be minimized or mitigated. The Project would continue to comply with the Migratory Bird Treaty Act and E.O. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. Cumulatively, no adverse impacts to wildlife are anticipated to result from the overall 37,972-acre SBR No. 6 mine expansion or ongoing and proposed actions in the existing 2,420-acre surface effects area due to implementation of the integrated fish and wildlife reclamation plan.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Aquatic Life	No direct or indirect impacts to aquatic life would occur in association with the Proposed Action. Impacts to aquatic life due to bleeder shaft facilities would be avoided, minimized, or mitigated, per permit requirements. Temporary, minor effects to aquatic life due to construction of the East Refuse Disposal Area. Temporary, minor impacts to aquatic life due to subsidence of approximately 22,484 acres.	Impacts to aquatic life due to Bleeder Shaft Facilities would be avoided, minimized, or mitigated, per permit requirements. As with the No Action Alternative, temporary, minor effects to aquatic life due to construction of the East Refuse Disposal Area. Temporary, minor impacts to aquatic life due to subsidence of approximately 10,549 acres. Cumulatively, minor temporary impacts to aquatic life could occur in the 33,033-acre subsidence area associated with the overall 37,972-acre SBR No. 6 expansion area and due to surface disturbances associated with the subsidence area and the existing 2,420-acre surface effects area. However, no long-term adverse impacts are anticipated due to avoidance or the implementation of mitigation measures following subsidence.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Federally Listed Species	No direct or indirect impacts to federally listed species would occur in association with the Proposed Action. Coordination with USFWS on the effects of surface disturbances is ongoing or will occur when their locations are known. Subsidence of 22,484 acres within the private/TVA-approved shadow area would not be likely to adversely affect any federally listed species.	Coordination with USFWS on the effects of surface disturbances is ongoing or will occur when their locations are known. Subsidence of 10,549 acres within the Shadow Area would not be likely to adversely affect any federally listed species. Cumulatively, no adverse impacts to federally listed species are anticipated to result from planned subsidence of 33,033 acres associated with the overall 37,972-acre SBR No. 6 expansion area. Ongoing coordination with USFWS would determine cumulative effects due to surface disturbances associated with the subsidence area and the existing 2,420-acre surface effects area.
State-Listed Species	No direct or indirect impacts to state-listed species would occur in association with the Proposed Action. Temporary impacts to state-listed threatened and endangered species may occur due to surface disturbances or coal extraction-related effects. These impacts would be subject to mitigation under Sugar Camp's integrated fish and wildlife reclamation plan and would thus be minimized or mitigated.	Temporary impacts to state-listed threatened and endangered species may occur due to surface disturbances or coal extraction-related effects. These impacts would be subject to mitigation under Sugar Camp's integrated fish and wildlife reclamation plan and would thus be minimized or mitigated. Cumulatively, no adverse impacts to state-listed species are anticipated to result from the overall 37,972-acre SBR No. 6 mine expansion or ongoing and proposed actions in the existing 2,420-acre surface effects area due to implementation of the integrated fish and wildlife reclamation plan.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Natural Areas	No direct or indirect impacts to natural areas would occur in association with the Proposed Action. Planned subsidence of approximately 22,484 acres could cause indirect effects to natural areas in the vicinity of the SBR No. 6 mining activities due to temporary effects to hydrologic patterns, but with restoration, permanent impacts to these natural areas would not result.	Planned subsidence of approximately 10,549 acres could cause indirect effects to natural areas in the vicinity of the Project due to temporary effects to hydrologic patterns, but with restoration, permanent impacts to these natural areas would not result. Cumulatively, minor temporary indirect impacts to natural areas in the vicinity could occur as a result of subsidence of 33,033 acres associated with the overall 37,972-acre SBR No. 6 expansion area and temporary effects to hydrologic patterns. However, no long-term adverse impacts to natural areas are anticipated due to no direct impacts being anticipated and indirect impacts being subject to post-subsidence reclamation activities.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Land Use	No direct or indirect impacts to land use would occur in association with the Proposed Action. Minor, temporary or permanent land use impacts would result due to surface disturbances. The effects of construction of the 389-acre East Refuse Disposal Area would be permanent, as the land may no longer support cultivated crops but could be used for pasture land and potentially other land uses. Temporary, minor impacts on land use to approximately 22,484 acres could occur as a result of subsidence, as these areas would be restored following subsidence.	Minor, temporary or permanent land use impacts would result due to surface disturbances. As with the No Action Alternative, the effects of construction of the 389-acre East Refuse Disposal Area would be permanent, as the land may no longer support cultivated crops but could be used for pasture land and potentially other land uses. Temporary, minor impacts on land use to approximately 10,549 acres could occur as a result of subsidence, as these areas would be restored following subsidence. Cumulatively, minor temporary impacts to land use could occur in the in the 33,033-acre subsidence area associated with the overall 37,972-acre SBR No. 6 expansion area. However, these would be mitigated by reestablishment of drainage patterns or compensation to farmers. Overall, permanent changes to agricultural uses resulting from existing and proposed refuse disposal areas within the existing 2,420-acre surface effects area would have a minor effect, as cultivated crops are prevalent in Franklin County and throughout the state.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Transportation	No direct or indirect impacts to transportation would occur in association with the Proposed Action. Minor, temporary effects to transportation in the vicinity of SBR No. 6 operations due to construction and operations associated with ongoing actions. This has minor effects on local roadways and the Canadian National Railway. Temporary or permanent closure of North Bobtail Road as a result of construction of the East Refuse Disposal Area. Subsidence of approximately 22,484 acres has the potential to impact roads and bridges; however, any damage would be repaired, per IDNR-OMM requirements.	Minor, temporary effects to roadways in the Project Area and the Canadian National Railway due to construction and operations associated with the Action Alternative. As with the No Action Alternative, temporary or permanent closure of North Bobtail Road as a result of construction of the East Refuse Disposal Area. Subsidence of approximately 10,549 acres has the potential to impact roads and bridges; however, any damage would be repaired, per IDNR-OMM requirements. Cumulatively, minor, temporary impacts to local roadways would occur during construction or possibly as a result of the planned subsidence of 33,033 acres associated with the overall 37,972-acre SBR No. 6 expansion area. Any damage associated with subsidence would be repaired, per IDNR-OMM requirements. Some local road closures could also occur due to the SBR No. 6 mine expansion and ongoing and proposed actions in the existing 2,420-acre surface effects area, resulting in minor, temporary or permanent cumulative effects.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Utilities	No direct or indirect impacts to utilities would occur in association with the Proposed Action. Permanent impacts to an existing water line segment within the East Refuse Disposal Area, but these impacts would be mitigated through its relocation. Minor impacts to utilities would occur as a result of subsidence of approximately 22,484 acres, but these impacts would be mitigated through agreements with governmental bodies and utility companies.	As with the No Action Alternative, permanent impacts to an existing water line segment within the East Refuse Disposal Area, but these impacts would be mitigated through its relocation. Minor impacts to utilities would occur as a result of subsidence of approximately 10,549 acres, but these impacts would be mitigated through agreements with governmental bodies and utility companies. Cumulatively, minimal, short-term impacts to utilities would occur as a result of the planned subsidence of 33,033 acres associated with the overall 37,972-acre SBR No. 6 expansion area and proposed actions in the existing 2,420-acre surface effects area, but these impacts would be mitigated through agreements with governmental bodies and utility companies.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Cultural Resources	No direct or indirect impacts to cultural resources would occur in association with the Proposed Action. Impacts to cultural resources may occur due to construction of surface facilities; however, these would be minimized or mitigated in consultation with IHPA. Extraction of coal within the 25,847-acre Shadow Area would have no effect on historic properties. Subsidence of 22,484 acres would have no effect on archaeological sites and could have a minor, temporary effect to abovegound cultural resources that would be minimized by repair or compensation to property owners for structural damage.	Impacts to cultural resources may occur due to surface disturbances. TVA will continue to consult with IHPA and interested tribes regarding Project effects to cultural resources throughout the environmental review process. Extraction of coal within the 12,125-acre Shadow Area would have no effect on historic properties. Subsidence of 10,549 acres would have no effect on archaeological sites and could have a minor, temporary effect to aboveground cultural resources that would be minimized by repair or compensation to property owners for structural damage. Cumulatively, impacts to cultural resources in relation to the overall 37,972-acre SBR No. 6 expansion area and proposed actions in the existing 2,420-acre surface effects area may occur; however these would be avoided, minimized, or mitigated in consultation with IHPA and interested tribes.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Solid and Hazardous Waste	No direct or indirect solid and hazardous materials impacts would occur in association with the Proposed Action. Sugar Camp maintains a Spill Prevention, Control, and Countermeasure (SPCC) Plan for onsite bulk oil in containment and report usage to USEPA, in accordance with applicable regulations. Subsidence does not generate additional solid or hazardous waste.	Solid and hazardous waste-related impacts in association with the Action Alternative would be avoided or minimized. Sugar Camp maintains a Spill Prevention, Control, and Countermeasure (SPCC) Plan for onsite bulk oil in containment and report usage to USEPA, in accordance with applicable regulations. Subsidence does not generate additional solid or hazardous waste. Cumulatively, solid and hazardous waste-related impacts associated with the overall 37,972-acre SBR No. 6 mine expansion and ongoing and proposed actions in the existing 2,420-acre surface effects area would be avoided or minimized by maintaining SPCC plans at all proposed coal facilities.
Human Health and Safety	No direct or indirect health and human safety impacts would occur in association with the Proposed Action. Operations related to previously approved TVA-owned coal and privately-owned coal would continue to comply with MSHA and OSHA regulations, IDNR Mine Safety and Training Division, and other relevant regulatory programs and, thus, avoid, minimize, or mitigate health and human safety risks.	The Proposed Action would comply with MSHA and OSHA regulations, IDNR Mine Safety and Training Division, and other relevant regulatory programs and, thus, avoid, minimize, or mitigate health and human safety risks. Cumulatively, no adverse impacts to human health and safety related to the overall 37,972-acre SBR No. 6 mine expansion or ongoing and proposed actions in the existing 2,420-acre surface effects area are anticipated due to compliance with regulatory safety programs.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Socioeconomics and Environmental Justice	No direct or indirect adverse or beneficial effects to socioeconomics or environmental justice would occur in association with the Proposed Action. Positive socioeconomic impacts from the current mining of TVA-owned coal and the current and future mining of privately owned coal would continue to occur. Environmental justice impacts would continue to be avoided due to compliance with IDNR permit requirements to avoid, minimize, or mitigate adverse effects.	Minor, beneficial effects on socioeconomics from the mining of additional TVA-owned coal would occur. While low-income populations are present in the Project Area, the Action Alternative would not disproportionately adversely affect environmental justice populations. Adverse environmental justice impacts would be avoided due to compliance with IDNR permit requirements to avoid, minimize, or mitigate adverse effects. Implementation of the Action Alternative would have beneficial socioeconomic effects; therefore, the Action Alternative could benefit environmental justice populations by providing new economic opportunities. Cumulatively, long-term beneficial socioeconomic and environmental justice impacts would result from implementation of the Action Alternative in combination with other SBR No. 6 activities and ongoing and proposed actions in the existing 2,420-acre surface effects area. Economic benefits include the purchase of materials, equipment, and services, and long-term increases in employment and income. These increases would be local or regional, depending on where the goods, services, and workers were obtained.

Resource Area	Impacts from No Action Alternative	Impacts from Action Alternative
Noise & Visual	No direct or indirect effects to noise and visual would occur in association with the Proposed Action. Minor, temporary visual and noise impacts would occur in the vicinity of the bleeder shaft facilities and the East Refuse Disposal Area during the operational lives of these facilities. During construction of the bleeder shaft facilities, noise impacts f would be avoided or mitigated, per IDNR permit requirements. Noise and visual impacts would not occur in subsidence areas.	Minor, temporary visual and noise impacts would occur in the vicinity of the Bleeder Shaft Facilities and the East Refuse Disposal Area during the operational life of these facilities. During construction of the Bleeder Shaft Facilities, noise impacts would be avoided or mitigated, per IDNR permit requirements. Noise and visual impacts would not occur in subsidence areas. Cumulatively, no long-term noise and visual impacts would occur in relation to the overall 37,972-acre SBR No. 6 mine expansion or ongoing and proposed actions in the existing 2,420-acre surface effects area. Noise impacts would continue to be avoided or mitigated, per permit requirements. Changes to the visual character of the vicinity of SBR No. 6 activities would be temporary due to implementation of the reclamation plan.

This page intentionally left blank

2.3 Identification of Mitigation Measures

Sugar Camp mining operations would be carried out in compliance with Illinois Regulatory Program 62 IAC 1700-1850, which specifies a comprehensive set of environmental protection measures for the control of adverse ecological impacts resulting from coal mining.

Included are considerations for air, water, acidic, and toxic materials, soils, landform, and vegetation, among others, in both spatial and temporal capacities. As such, general protective measures for all environmental values are inherent within the regulatory program. The expanse of mining and mining-related disturbances would be limited to that acreage necessary for conducting mining operations in compliance with the applicable land reclamation regulatory requirements. Disturbances to sites not required for mining or mining-related activities would be held to a minimum.

IDNR would require Sugar Camp to implement best management practices and mitigation to minimize potential adverse environmental effects throughout the Project Area as conditions of their mine permit. Additional mitigation requirements not listed below may arise in conjunction with future bleeder shaft development; these would be provided in future TVA environmental documents.

Permit conditions would be enforced by the State of Illinois; TVA does not regulate the mining activities of Sugar Camp. State of Illinois mitigation measures include:

1. The implementation of sediment and erosion control practices (e.g., silt fences, straw, mulch, or vegetative cover) and fugitive dust minimization (e.g., wetting roads prior to heavy use).

2. The implementation of water quality protection measures (e.g., sediment pond treatment, water quality monitoring, or establishment of riparian zone buffer zones).

3. The repair or compensation of any damage to buildings or other structures caused by subsidence.

4. The minimization of invasive species transmission per the requirements of the Illinois Noxious Weed Law.

5. Compensation for any interruption to well water quality or quantity caused by subsidence until the groundwater is restored.

6. The repair of any damage to roads caused by subsidence.

7. The repair of any drainage alteration caused by subsidence

8. The compensatory mitigation of wetlands and streams impacted by subsidence, if necessary. This condition would also be enforced by the USACE.

9. The repair of any damage to utilities caused by subsidence.

10. In a future environmental review, TVA will analyze floodplain impacts, including the Floodplains No Practicable Alternative analysis, if applicable, prior to construction of the five Bleeder Shafts, and potential impacts would be avoided or minimized.

2.4 The Preferred Alternative

TVA's preferred alternative is the Action Alternative. The purpose and need of the Proposed Action is to recover TVA's investment by approving the proposed SBR No. 6 mining plan under the terms of the coal lease agreement made with Sugar Camp in 2002. The Action Alternative is preferred because it is the most economical way to meet TVA's purpose and need. Other alternatives are not economically feasible, would have similar environmental impacts, and do not meet the purpose and need.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The affected environment and environmental consequences are described in the following sections for each environmental resource considered in this EIS. The environmental resources consist of the physical, biological, social, and cultural resources that could be affected by the No Action and Action Alternatives. TVA determined that these resources consist of geology and soils; floodplains; groundwater/aquifers; surface water; water quality; water supply; wetlands; air quality; greenhouse gases; wildlife; vegetation; aquatic life; threatened and endangered species; natural areas; land use; transportation; utilities; cultural resources; solid and hazardous waste; safety; socioeconomics/environmental justice; and noise and visual. TVA determined that certain resources would not be affected by the Action Alternative due to the nature of the proposed activities. These resources consist of recreation, Wild and Scenic Rivers, and navigation.

The description of the environmental consequences associated with the Action Alternative is divided into surface disturbances and coal-extraction related disturbances. As described in Section 2.1.2, surface disturbances consist of actions associated with the construction of the Bleeder Shaft Facilities, construction and operation of the proposed East Refuse Disposal Area, and any new effects from processing, storing, and transporting TVA-owned coal at the existing facilities. Coal-extraction related disturbances consist of the planned subsidence that would follow the extraction of approximately 186 million tons of unprocessed TVA coal.

3.1 Geology and Soils

The geology and soils of the Project Area were identified using a combination of the U.S. Geological Survey (USGS) topographic maps and National Hydrography Dataset (NHD) digital data, aerial photographs, USDA soil surveys, USFWS National Wetlands Inventory (NWI), and literature references.

3.1.1 Affected Environment

The Project Area lies within rolling uplands with elevations ranging from approximately 450 feet to 540 feet above mean sea level. The soils and landforms were created by erosion of the bedrock and glacial deposits, and were likely sculpted by the existing streams. Soils within the Project Area range from moderately drained, which support agriculture, to poorly drained, which support wetlands. Artificial drainage ditches have extended the agricultural land into areas that were previously wetland. The Project Area is located within the Southern Illinoisan Till Plain ecoregion, which is characterized by flat to rolling till plains (large flat plains covered with rocks, silt, and gravel that were deposited by glaciers) that become hillier to the south. Low moraines (i.e., till plains with irregular topography covered in soil, boulders, and rocks deposited by a glacier) also occur in this area.

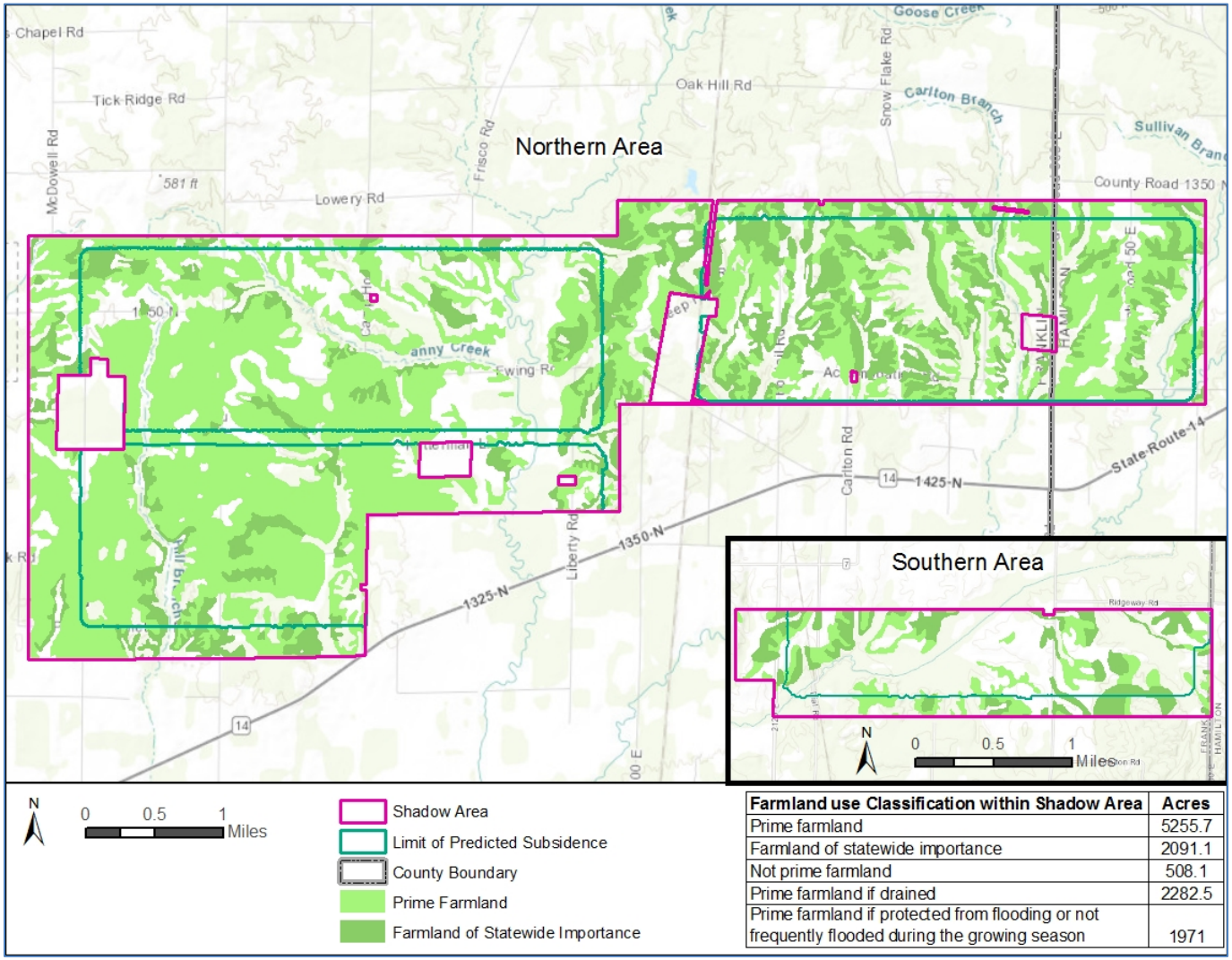
The Project Area is located in the southern portion of the Illinois Basin coalfield. The Herrin No. 6 coal seam, which is proposed to be mined, lies from 650 feet to more than 900 feet below ground. The Herrin No. 6 coal seam is part of the Carbondale formation, which is of Middle Pennsylvanian age (300 to 318 million years old). Claystone, sandy shale, and limestone lie under the coal seam. The Pennsylvania System and several layers of shale and limestone (e.g., Anvil Shale, Brereton Limestone, Anna Shale, and Energy Shale) lie

above the Herrin No. 6 coal seam. Unconsolidated glacial drift (rocks deposited by glaciers) lies above the Pennsylvania System.

Aquifers contained within these geologic formations are limited in size because high percentages of clay and porous sand and gravel beds do not create optimal conditions for retaining water. There are no recorded major aquifers in the Project Area. The Pennsylvanian sandstones and limestones may be considered as minor aquifers with low permeability and porosity and are highly mineralized. Water yields are low in the range of the one to ten gallons per minute (HMG 2018). Use of these aquifers is minimal due to depth from the surface and the resulting requirements for deep wells. Additional details on these and other aquifers are provided in the groundwater discussion.

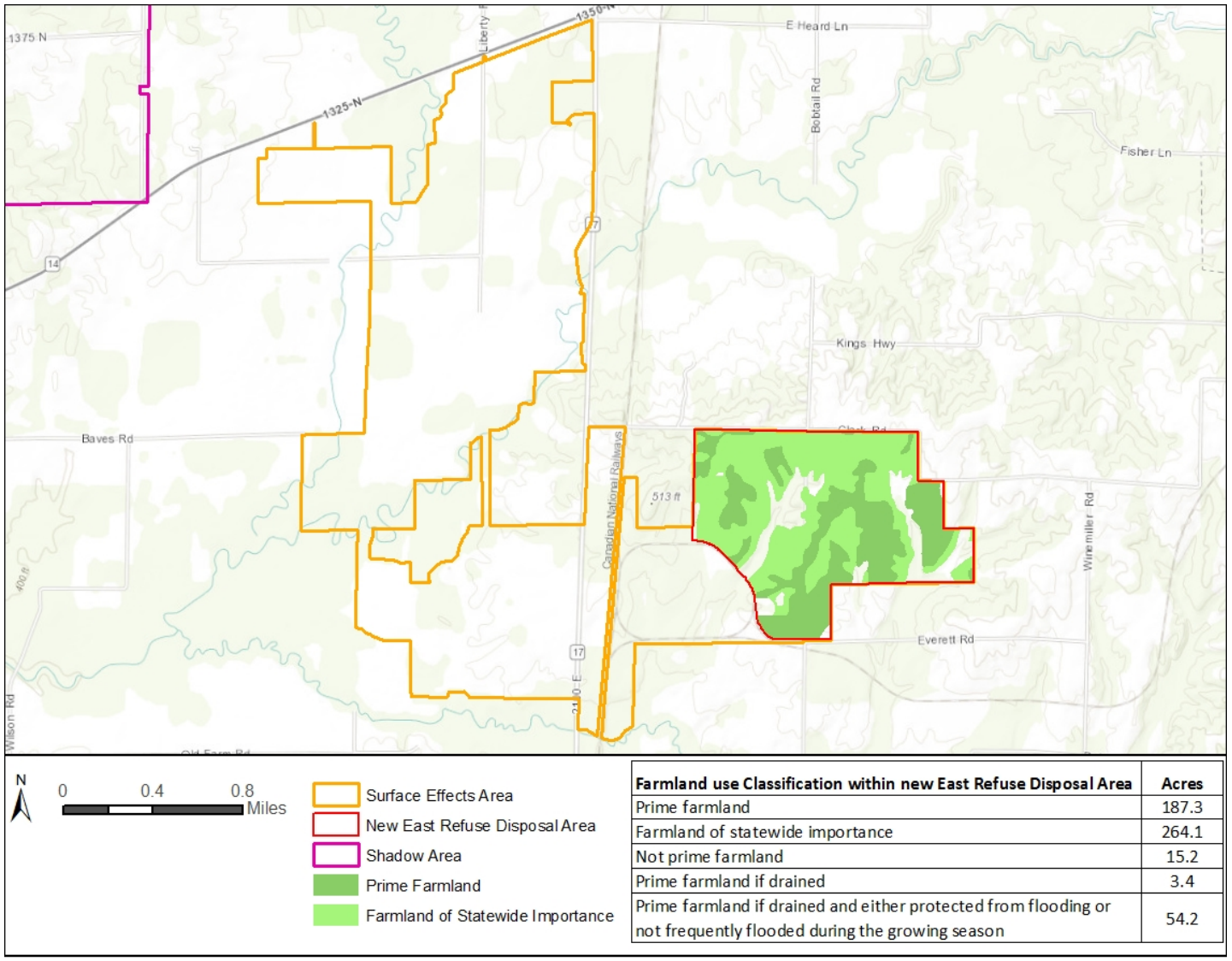
The Project Area is located in an area with a high seismic risk according to USACE (USACE 2016). The effective peak horizontal acceleration due to earthquake forces is 0.12g (Algermissen et. al, 1982, ATC 1978). A 0.1g earthquake is expected to have strong perceived shaking with light potential for damage.

A total of 39 soil units are mapped within the Project Area, including silt loams, silty clay loams, and clay loams. A portion of the soils within the Project Area is designated as prime farmland. The term “prime farmland” is assigned by the USDA to land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for such uses. Similarly, farmland of statewide importance is land other than prime farmland or unique farmland that is also highly productive. The FPPA requires federal agencies to consider the adverse effects of their actions on prime farmland, unique farmland, and farmland of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. The land can be forested land, pastureland, cropland, or other land, but it cannot be water or urban built-up land. The purpose of the FPPA is “to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.” FPPA does not authorize federal agencies to regulate the use of private or non-federal land, or in any way affect the property rights of owners. Based on soils data obtained from the USDA Web Soil Survey, approximately 8,276 acres (65 percent) of the Project Area that would be newly affected is designated as prime farmland or farmland of statewide importance. Figures 3-1 and 3-2 illustrate the prime farmland and farmland of statewide importance within the newly affected areas of the Project Area.



Farmland use Classification within Shadow Area	Acres
Prime farmland	5255.7
Farmland of statewide importance	2091.1
Not prime farmland	508.1
Prime farmland if drained	2282.5
Prime farmland if protected from flooding or not frequently flooded during the growing season	1971

Figure 3-1. Prime Farmland within the Shadow Area



Farmland use Classification within new East Refuse Disposal Area	Acres
Prime farmland	187.3
Farmland of statewide importance	264.1
Not prime farmland	15.2
Prime farmland if drained	3.4
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	54.2

Figure 3-2. Prime Farmland within the New East Refuse Disposal Area

3.1.2 Environmental Consequences

3.1.2.1 The No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to geology or soils. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR permit requirements.

These impacts consist of temporary impacts to soils due to surface disturbances and planned subsidence and permanent impacts to soils and prime farmland in the location of the East Refuse Disposal Area. Since the private/TVA-approved shadow area would be restored to agricultural use, permanent impacts would not occur to prime farmland as a result of subsidence. Ongoing mining operations would result in a permanent change to the geology of the private/TVA-approved shadow area due to removal of approximately 9.6 percent of the total available acreage of the Herrin No. 6 coal seam.

3.1.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining plan. This would result in temporary impacts to soils due to surface disturbances and planned subsidence. Long-term impacts from the Project would occur due to construction of the East Refuse Disposal Area. The Project would result in a permanent change to the geology of the Project Area due to removal of a portion of the Herrin No. 6 coal seam.

Although the Shadow Area would not be subject to FPPA due to plans to fully restore it to agricultural use (USDA 2019), TVA opted to consider the effects of the Action Alternative on prime farmland and farmland of statewide importance.

Surface Disturbances

Based on soils data obtained from the USDA Web Soil Survey, approximately 7,798 acres (approximately 54 percent) of the Shadow Area is designated as prime farmland or farmland of statewide importance. During construction and operations, farmland would be temporarily disturbed at the locations of the Bleeder Shaft Facilities (approximately 27 acres). The Bleeder Shaft Facility locations would be restored to IDNR-OMM-approved post-mining conditions involving re-contouring to restore the hydrology, as described in Section 2.1.2.3. Therefore, no permanent impacts to soils or farmland are anticipated in these areas.

Approximately 451 acres (approximately 86 percent) of the East Refuse Disposal Area site is designated as prime farmland or farmland of statewide importance. The East Refuse Disposal Area would not be fully removed; instead, the disposal area would be filled to capacity, capped with soils, and made to adequately drain, as described in Section 2.1.2.3. Due to the lack of full restoration, permanent effects to prime farmland on approximately 164 acres (approximately 31 percent) of the 525-acre disposal area site are anticipated. However, this area could likely be used as pasture land following partial restoration. Overall, these effects to prime farmland would be minor due to being a small percentage in farmland across Franklin County (less than 0.3 percent) and the state (less than 0.002 percent; USDA 2017).

Sugar Camp would be responsible for the operation, inspection and maintenance of the new East Refuse Disposal Area. This structure would be inspected at least annually. The disposal area would also be inspected immediately after major storms and earthquakes by a qualified engineer. If the inspection team finds any significant problems developing, Sugar Camp would take actions to correct them.

Coal Extraction-Related Effects

The Project would result in a permanent change to the geology of the Project Area due to removal of a small portion of the Herrin No. 6 coal seam. Overall, these effects would be minor as the Project would extract approximately 4.5 percent of the total available acreage of the Herrin No. 6 coal seam.

Subsidence could temporarily affect approximately 5,519 acres of prime farmland and farmland areas of statewide importance within the Shadow Area due to changes in surface drainage patterns and soil moisture. IDNR-OMM requires coal companies to reestablish drainage patterns and stream profiles affected by mining activities. Topsoil removed during surface-disturbing activities would be replaced with a six-inch thick layer of topsoil during reclamation as outlined in the UCM application to IDNR-OMM. Sugar Camp is required to compensate landowners for any temporary crop loss from impaired drainage and any permanent crop loss due to the alteration or installation of waterways.

The permanent impact to prime farmland post-reclamation would be minor due to planned reclamation efforts to return the area to IDNR-OMM-approved post-mining drainage patterns. Per IDOA, “Agriculture Department staff serve as advisors to the coal mining industry and the IDNR in mined land reclamation and restoration efforts. The Agriculture Department reviews mining permit applications to ensure they contain adequate farmland reclamation plans. Employees conduct on-site inspections to monitor the quality and timeliness of reclamation work. By overseeing the collection of crop samples on mined land, the Department helps determine whether yields meet specified targets that correspond to the land’s pre-mining production levels” (IDOA 2018). IDOA reviewed the SBR No. 6 permit application and expressed no concerns given that the subsided area would be restored.

IDNR-OMM ensures that the active coal mining operations are properly reclaimed, thereby assuring the restoration of lands affected by mining (including subsidence) to productive uses. IDNR-OMM inspects all coal mining sites to ensure reclamation standards are met and that approved reclamation plans are followed. Additionally, IDNR-OMM responds to citizen complaints through investigation and inspections. It is the mining company’s responsibility to correct all impaired surface drainage in a timely manner as well as to compensate farmers for crop loss until repairs are completed. Some prime farmland and farmland areas of statewide importance could be temporarily impacted during the process of correcting drainage problems, but the permanent impact would be minor.

In the event that temporarily impaired drainage or drainage repair work from subsidence causes crop losses or prevents the temporary planting of crops, the surface owner or tenant farmer would be eligible for compensation as follows:

- Crop loss would be compensated by paying an agreed to posted price at the local farm service center for the year’s loss based on the average prior yields for the affected fields, and

- Alteration or construction of additional waterways would be compensated by paying the fair market value for the acreage removed from production, or

- Other reasonable compensation which may be mutually negotiated with a landowner on a case-by-case basis.

Cumulative Effects

Cumulatively, Sugar Camp's ongoing actions related to SBR No. 6 and the Proposed Action would result in permanent removal of approximately 14.1 percent of the Herrin No. 6 coal seam. Permanent, cumulative effects to prime farmland due to existing and proposed refuse disposal areas would potentially impact approximately 3,600 acres in Franklin County. These permanent changes to farmland associated with SBR No. 6 actions would affect approximately 2.1 percent of farmland in Franklin County and approximately 0.01 percent of farmland across the state.

3.2 Water Resources

This section describes the potentially affected environment and environmental consequences for groundwater, surface water, wetlands, floodplains, water quality, and water supply. Water resources were identified using a combination of the U.S. Geological Survey (USGS) topographic maps, aerial photographs, USDA soil surveys, USGS NHD, USFWS NWI, literature references, onsite observations during field surveys of portions of the Project Area, and mail surveys administered by Sugar Camp.

3.2.1 Groundwater/Aquifers

3.2.1.1 Affected Environment

The Project Area is located in the glaciated upland area of northeastern Franklin County and western Hamilton County, situated at the headwaters of the major drainage systems of the region. In this area, no specific geologic unit has been identified as a major surficial aquifer. According to Illinois State Geological Survey (ISGS) Circular 212, Groundwater Geology in Southern Illinois, the thickest unconsolidated material in Franklin County is in Big Muddy River Valley, west of the Project Area. The glacial deposits are generally thin and are not water-yielding (ISGS 1956).

Minor scattered sand and gravel surficial aquifers with potential surficial sources exist in the Middle Fork Big Muddy River Valley and its larger tributaries, such as Sugar Camp Creek, Ewing Creek, Akin Creek and Jordan Creek. These aquifers produce some low-yield water supplies.

Pennsylvanian sandstones in the northern and southeastern portions of Franklin County and western portion of Hamilton County can usually provide sufficient water for individual domestic supplies. Yields from wells into these formations are usually less than 10 gallons per minute, with yields less than five gallons per minute common. The low permeability of the Pennsylvanian System rocks cause the water in the deeper formations to be highly mineralized. Therefore, some deeper bedrock aquifers may contain water of unsatisfactory quality without treatment and are generally not developed. Recharge to these bedrock aquifers is primarily from precipitation that percolates into and through the overlying unconsolidated materials. Recharge primarily takes place at outcrop areas for the various bedrock units. Several landowners reported using wells installed in Pennsylvanian sandstone ranging from 200 to 360 feet in depth (less than a third as deep as the Herrin

No. 6 coal seam). Yields of less than 5,000 gallons per day are generally reported for domestic wells finished in these formations. A bedrock aquifer associated with Pennsylvanian strata in the depth range of 200 to 360 feet is utilized as a water source for domestic and farm use in the area. This aquifer is locally known as “white sandstone” and is reported to provide high quality water in quantities sufficient for domestic and farm use.

The Mt. Simon Sandstone, Trivoli Sandstone, and the Anvil Sandstone bedrock strata discussed in Section 3.1.1 are potential water bearing bedrock strata. The Mt. Simon Sandstone is highly saline in Southern Illinois and is not used as a potable aquifer. Even though the Trivoli Sandstone is a widespread unit, rapid lateral facies changes occur which limits the Trivoli’s utility as a reliable aquifer (Willman 1975) and is quite saline.

As a result of the existing longwall mining operations, Sugar Camp has reportedly experienced water diminishment in wells within the Project Area; however, IDNR has not been contacted by any resident regarding well water issues. Due to this diminishment, Sugar Camp provided well owners with public water supply connections and has a plan in place to continually monitor water levels in these wells.

3.2.1.2 Environmental Consequences

3.2.1.2.1 The No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to groundwater. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR-OMM permit requirements.

Surface disturbance activities are not anticipated to impact groundwater quantity as no consumptive uses of groundwater are planned. As a result of the formation of subsidence fractures, temporary, short-term groundwater quantity impacts could potentially occur in the 22,484-acre subsidence area associated with the private/TVA-approved shadow area. The No Action Alternative would be subject to Sugar Camp’s groundwater monitoring program, which necessitates routine monitoring and compliance. Therefore, minor, temporary impacts to groundwater would occur under the No Action Alternative.

3.2.1.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining plan. Surface disturbance activities are not anticipated to impact groundwater quantity as no consumptive uses of groundwater are planned. Temporary, short-term groundwater quantity impacts from subsidence could potentially occur resulting from the formation of subsidence fractures.

Sugar Camp’s groundwater monitoring program is designed to provide sufficient lead time for identification of any potential impacts, as well as to provide ample time for the investigation and mitigation of any impacts. Sugar Camp is required to monitor the groundwater throughout the life of the mine, up to and including the time of final bond release. IDRN-OMM reserves the right to add monitoring parameters or monitoring locations should the need arise.

Surface Disturbances

Due to the design of the bleeder ventilation shafts, including the use of casings that would isolate the shafts from groundwater, their construction and operation would not adversely affect groundwater. Other components associated with the Bleeder Shaft Facilities would also not impact groundwater.

The East Refuse Disposal Area would be subject to Sugar Camp's groundwater monitoring program, which necessitates routine monitoring and compliance, as described above. Non-compliance with the groundwater monitoring program would be investigated and mitigated appropriately.

Overall, impacts to groundwater resulting from the surface disturbances would be minor and insignificant.

Coal Extraction-Related Effects

While unlikely in the areas where the room-and-pillar method is used, planned subsidence of up to 5.5 feet would occur in areas where longwall mining methods are used. Any subsidence could potentially alter any water-bearing strata. Subsidence can either cut off groundwater flow by the compression of rock layers or increase groundwater flow because the rock layers are fractured, giving water more passages to move through (Owili-Eger 1983). In some cases, poor (water quality and quantity) aquifers can improve after mining because of this increased groundwater flow (Booth and Spande 1991).

Since no major aquifers exist in the area, the fracturing of rock layers during subsidence would not likely cause a significant change in underground hydrologic patterns. Groundwater quantity is expected to recover to pre-mining levels through time. No significant, detrimental impacts on drinking, domestic and residential water supplies are anticipated.

Per IDNR-OMM requirements, wells would be monitored during subsidence operations and any decrease in water quality and/or quantity would be remediated by Sugar Camp, and adequate clean water would be supplied to the parties affected until the remediation is completed.

Cumulative Effects

Cumulatively, short-term groundwater quantity impacts would occur in the 33,033-acre subsidence area associated with the overall 37,972-acre SBR No. 6 expansion area and proposed actions in the existing 2,420-acre surface effects area. However, significant impacts to groundwater would not occur due to implementation of the IDNR-OMM-required groundwater monitoring program and reclamation plan. A cumulative hydrologic impact assessment done by IDNR for the entire UCM Permit No. 382 shadow area and nearby permitted areas found that the mining operations were designed to prevent material damage to the hydrologic balance in the permit areas and surrounding vicinities.

3.2.2 Surface Waters and Wetlands

Surface waters and wetlands in the Project Area were identified using a compilation of data from the NHD, NWI, and non-digitized field survey data conducted at the location of the East Refuse Disposal Area. The field surveys were conducted between 2005 and 2007 by

Alliance Consulting, Inc., and their sub consultant HDR/Cochran and Wilken, Inc., and in 2012 by EcoSource, Inc. In 2019, Alliance Consulting compiled the results of these efforts into one report for Sugar Camp's use in the SBR No. 6 permitting process (Appendix B; Alliance Consulting 2019a).

3.2.2.1 Affected Environment

Surface water is described as water flowing through a defined watercourse (e.g., rivers, streams, or creeks with a defined bed and bank), or stored within a reservoir, pond, or lake. Surface water streams are classified as perennial, intermittent, or ephemeral, depending on the usual level of flow of the water conveyance. The Project Area lies within six sub-basins of the Big Muddy River watershed: Sugar Camp Creek (Hydrologic Unit Code [HUC] 071401060402), Carlton Branch-Middle Fork Big Muddy River (HUC 071401060403), Jordan Creek-Middle Fork Big Muddy River (HUC 071401060405), Sullivan Branch-Middle Fork Big Muddy River (HUC 071401060401), Akin Creek (071401060404), and Ewing Creek (HUC 071401060407).

Seven named streams, Granny Creek, Carlton Branch, Web Hill Branch, Sugar Camp Creek, Campbell Branch, Sullivan Branch, Ewing Creek, and Middle Fork Big Muddy River as well as multiple unnamed tributaries and creeks flow through the Project Area (Table 3-1 and Figure 3-2). The Middle Fork Big Muddy River is listed as impaired for chloride, iron, mercury, and sedimentation/siltation on the 303d list of impaired waters (IEPA 2018; see Section 3.2.4). According to the NHD, there are approximately 317,749 linear feet of streams in the Shadow Area and approximately 64,991 linear feet of streams in the surface effects area. Surveys for surface water at the East Refuse Disposal Area location identified a total of 34 stream channels (27,806 linear feet), consisting of 17 ephemeral streams (11,059 linear feet) and 17 intermittent streams (16,647 linear feet).

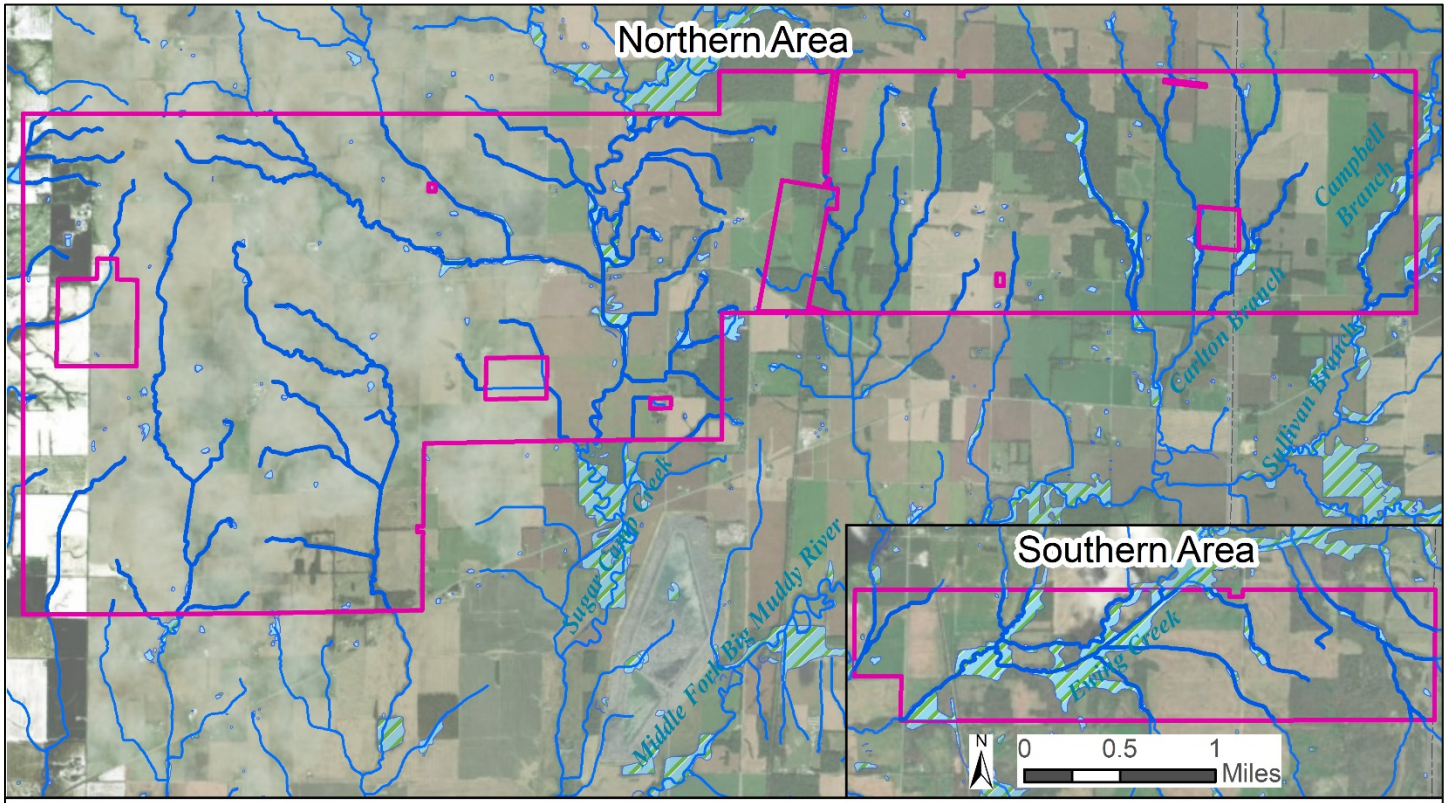
Table 3-1. Named Streams within the Project Area

Named Waterbody	Shadow Area	Surface Effects Area
Granny Creek	X	
Carlton Branch	X	
Web Hill Branch	X	
Sugar Camp Creek	X	X
Campbell Branch	X	
Sullivan Branch	X	
Ewing Creek	X	
Middle Fork Big Muddy River		X

Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, mud flats, and natural ponds. EO 11990 (Protection of Wetlands) directs federal agencies to minimize the destruction, loss, or degradation of wetland and preserve and enhance the natural and beneficial values of wetlands. In addition, activities in wetlands are regulated under CWA and various state water quality protection regulations.

The NWI is produced by USFWS and provides information on the characteristics, extent, and status of wetlands and deepwater habitats in the U.S. NWI mapping is broad scale, providing approximate locations of wetlands one acre or larger. NWI data was obtained from the USFWS online wetland mapper.

Within the Shadow Area, NWI data indicate that there are approximately 33.8 acres of ponds, 353 acres of freshwater forested/shrub wetlands, and 3.9 acres of emergent wetlands (Figure 3-3). Within the surface effects area, NWI data indicate that there are approximately 6.4 acres of ponds, 49.5 acres of freshwater forested/shrub wetlands, and 12.5 acres of emergent wetlands (Figure 3-4). Surveys for wetlands and ponds at the East Refuse Disposal Area location identified a total of six wetlands (1.4 acres) and one pond (0.2 acres).



Shadow Area

National Hydrography Dataset	Frequency	Feet
Streams	136	317,749

National Wetland Inventory	Frequency	Acres
Emergent Wetlands	9	4
Forested/Shrub Wetlands	28	353
Freshwater Ponds	70	34

Figure 3-3. Surface Waters and Wetlands within the Shadow Area, per NHD and NWI

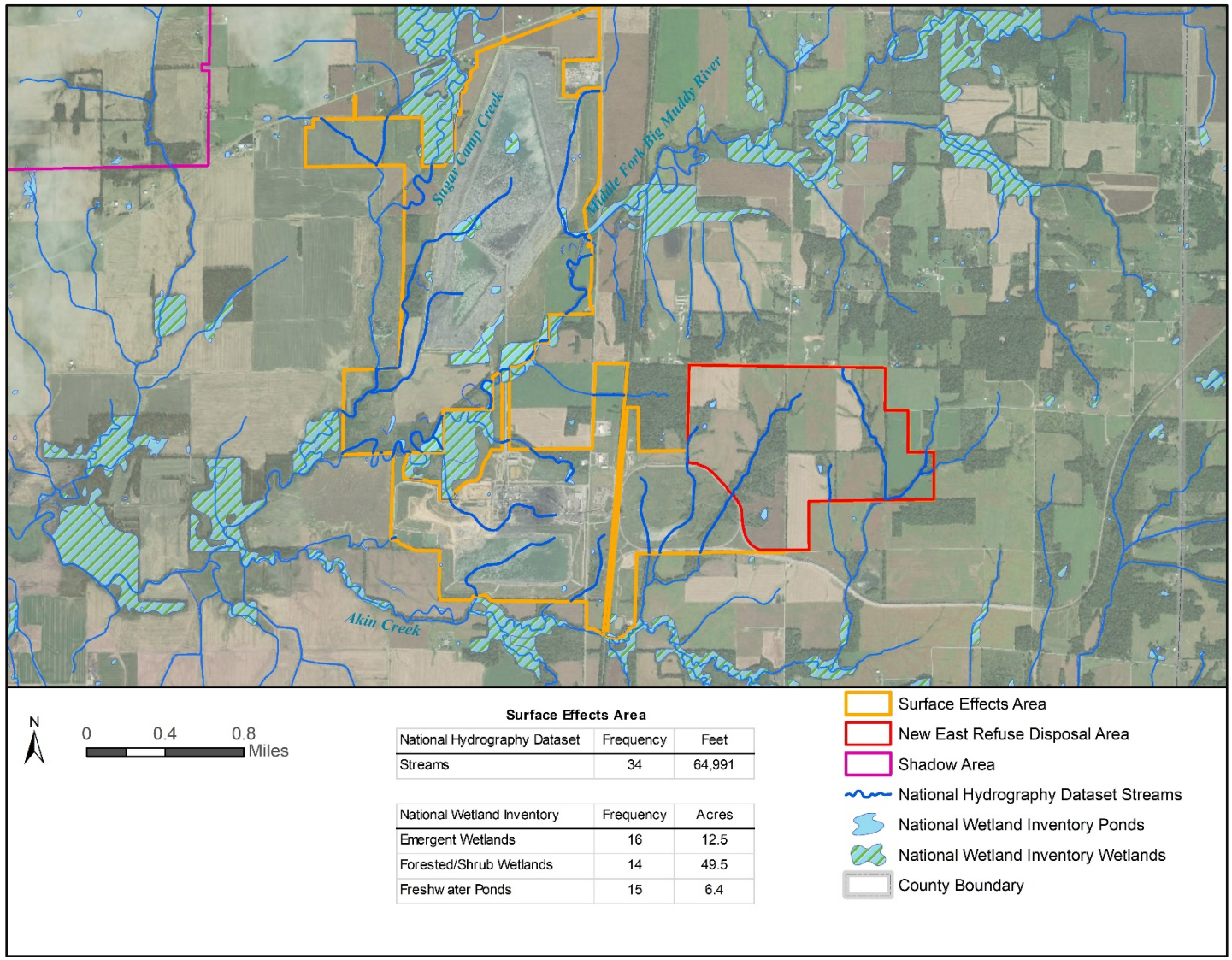


Figure 3-4. Surface Waters and Wetlands within the Surface Effects Area, per NHD and NWI

3.2.2.2 Environmental Consequences

3.2.2.2.1 The No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to surface waters and wetlands. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these would continue to be minimized or mitigated, per IDNR-OMM permit requirements.

According to Sugar Camp, the bleeder shaft facilities would be located to avoid Waters of the U.S. to the maximum extent practicable. Site-specific impacts would be evaluated by TVA prior to construction since the exact locations of these facilities are currently unknown. Construction on the site of the East Refuse Disposal Area would potentially impact 27,806 linear feet of ephemeral and intermittent streams, 1.4 acres of wetlands, and one pond totaling 0.2 acres. As described in Section 1.5.2, impacts to Waters of the U.S. would be subject to USACE 404 permits and IEPA 401 Water Quality Certifications and mitigated, if required by the permit conditions. Temporary impacts could occur to surface waters and wetlands, including Waters of the U.S., as a result of subsidence, but hydrology and drainage would be restored under the No Action Alternative, and thus, no permanent impacts would occur to wetlands and surface water in the private/TVA-approved shadow area.

3.2.2.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining plan. This would result in insignificant impacts to surface waters and wetlands due to surface disturbances and temporary impacts due to planned subsidence in the Shadow Area, as described below.

Surface Disturbances

The effects of construction and operation of the Bleeder Shaft Facilities on surface waters and wetlands would be reviewed by TVA prior to construction, as the exact locations of these facilities are currently unknown. If surface waters occur at the proposed locations of these facilities, direct impacts to streams would be avoided or mitigated. If wetlands are present at the Bleeder Shaft Facilities, there may be permanent impacts to these waterbodies due to surface disturbances. No major impacts to surface water and wetlands are expected and would be avoided to the maximum extent practicable.

Construction on the 525-acre site of the East Refuse Disposal Area would potentially impact 27,806 linear feet of ephemeral and intermittent streams, 1.4 acres of wetlands, and one pond totaling 0.2 acres. As described in Section 1.5.2, impacts to Waters of the U.S. would be subject to USACE 404 permits and IEPA 401 Water Quality Certifications. Impacts to streams and wetlands, including Waters of the U.S., would be mitigated as required by these permits.

Coal Extraction-Related Effects

As a condition of the mining permit, Sugar Camp must return water flow patterns to pre-subsidence patterns through stream mitigation activities. Additionally, if a man-made pond were to be affected by subsidence, Sugar Camp would be required to reconstruct the ponds to their original configuration.

Subsidence can affect surface water by altering stream elevations and gradients, thus affecting drainage patterns. Sugar Camp is required by IDNR-OMM to repair any drainage changes caused by mining activities. No point sources of pollution or removal of existing surface water features would occur. Existing surface water features may require future modifications for drainage repair; these modifications would undergo further environmental review as required as the State of Illinois and USACE. No change in the availability of surface water in the Shadow Area and adjacent area is anticipated.

Prior to reclamation, there could be temporary impacts to the approximately 403 acres of NWI-mapped wetlands present within the subsidence area. Potential impacts related to subsidence include changes in hydrology, plant communities, and hydroperiod (i.e., the length of time that there is standing water at a specific location). A study of mining subsidence and its effects on wetlands in southern Illinois by Nawrot et al. (2003) indicated subsidence could produce diverse wetland communities with increased habitat value. The study found that there was an increase in the number of isolated depressional wetlands after subsidence.

Initial changes in groundwater and subsurface flow due to subsidence could create increased temporary wetland vegetation in new areas of standing water (Nawrot et al. 2003). As a part of the IDNR permitting process, drainage must be corrected following subsidence in order to restore the hydrology of the subsided area to IDNR-OMM-approved post-mining topographic conditions. After landscape re-contouring, the flow would largely be restored to pre-mining conditions, and the newly-created ponded areas would decrease. Figure 3-5 indicates areas that would be likely to pond and locations where drainage corrections would be necessary. Once hydrology is restored, no permanent impacts would remain and overall impacts to surface waters and wetlands from subsidence would be insignificant.

Cumulative Effects

Cumulatively, minor temporary impacts to surface waters and wetlands could occur in the 33,033-acre subsidence area associated with the overall 37,972-acre SBR No. 6 expansion area. No significant cumulative impacts in association with the mine expansion or proposed actions in the existing 2,420-acre surface effects area are anticipated due to avoidance of surface water and wetlands to the maximum extent practicable. Any impacts to Waters of the U.S. would be subject to USACE 404 permits and IEPA 401 Water Quality Certifications and would be mitigated as required by these permits.

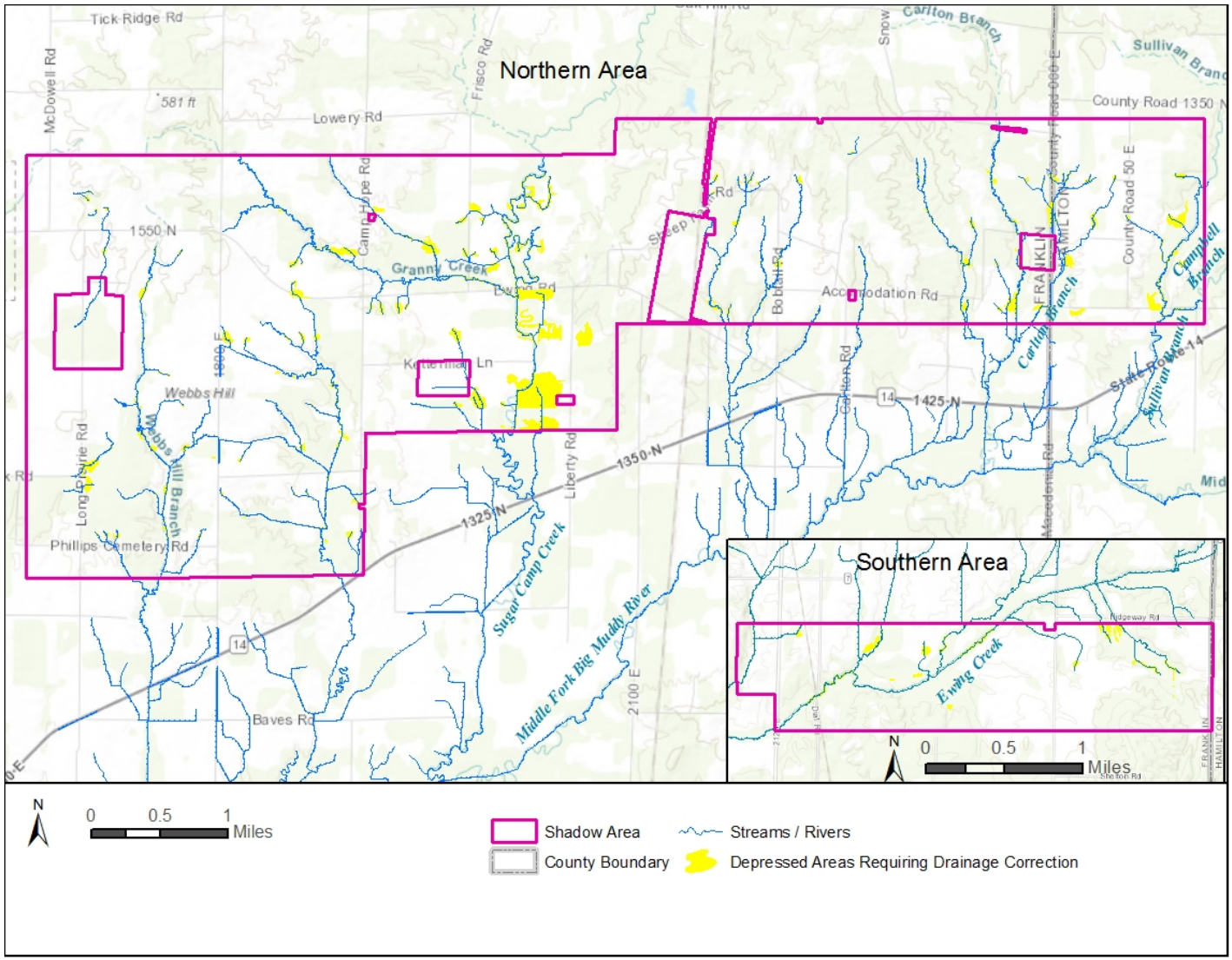


Figure 3-5. Depressed Areas within the Shadow Area Requiring Drainage Correction

3.2.3 Floodplains

3.2.3.1 Affected Environment

Floodplains are relatively level lands along streams and rivers that are subject to periodic flooding. The area subject to a one-percent chance of flooding in any given year is normally called the 100-year or one-percent-annual-chance floodplain. EO 11988 requires federal agencies to evaluate the potential effects of proposed actions within the 100-year floodplain on natural and beneficial floodplain values, along with alternatives that would reduce or eliminate such effects.

Five floodplain areas occur in the Project Area. Three are in the northern portion of the Shadow Area (see Figure 3-6). They are associated with Granny Creek/Sugar Camp Creek, Carlton Branch, and Sullivan Branch/Campbell Branch. One floodplain area is in the southern portion of the Shadow Area (see Figure 3-6), and it is associated with Ewing Creek. The fifth floodplain area is associated with the Middle Fork Big Muddy River and is where the surface effects area is located. The 100-year floodplain covers approximately 1,307 acres within the Shadow Area. The 100-year floodplain also covers approximately 747 acres within the surface effects area.

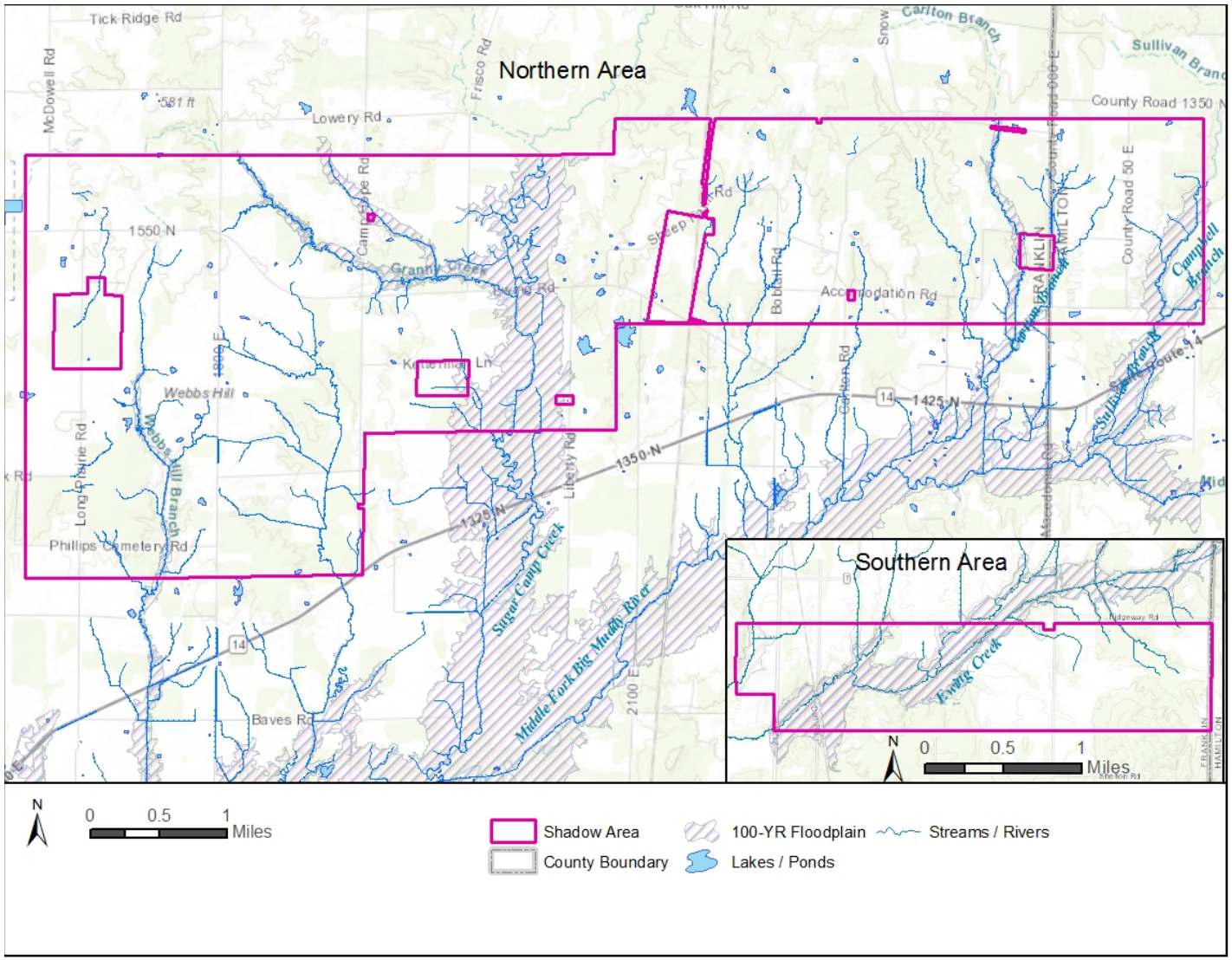


Figure 3-6. Floodplains within the Shadow Area

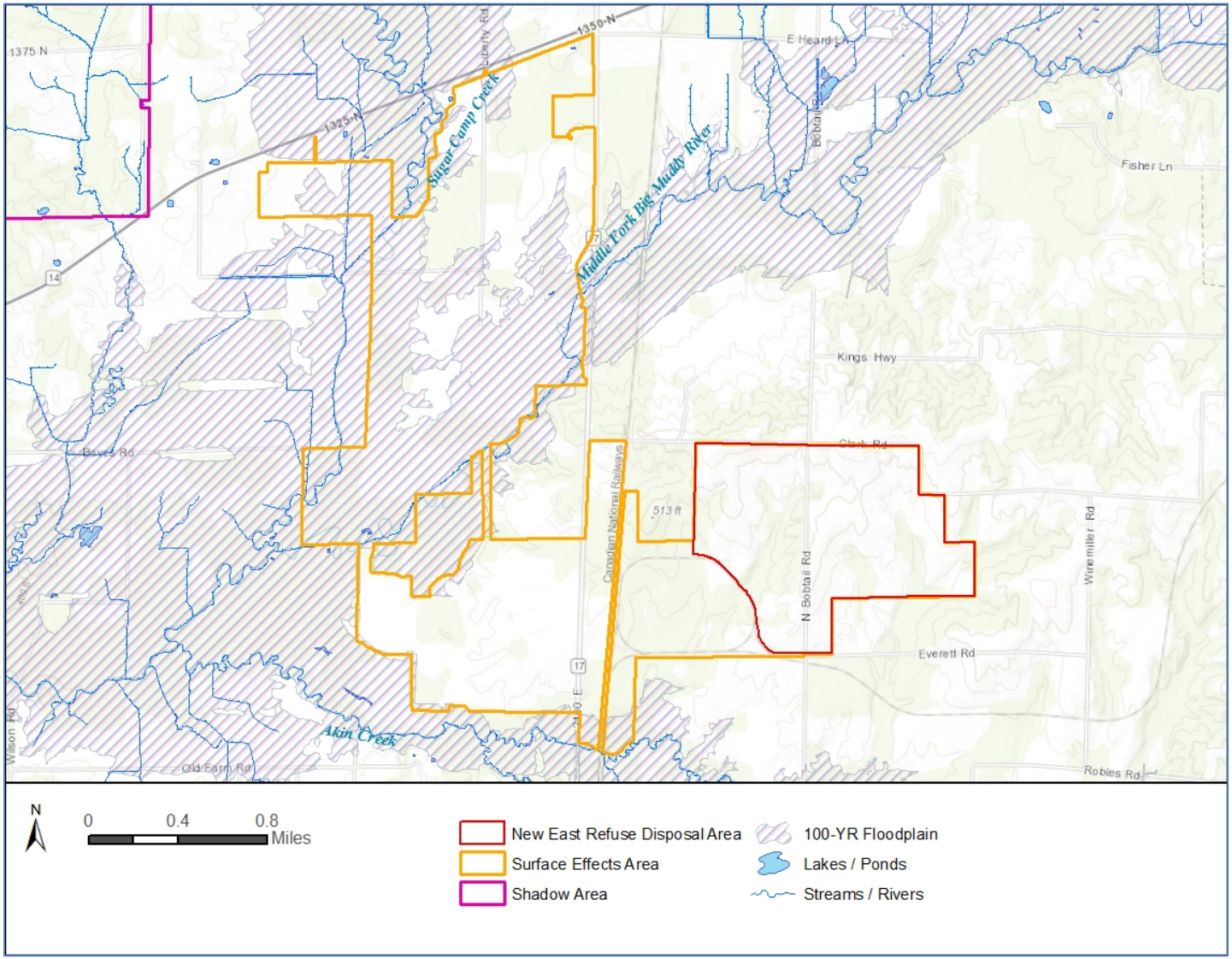


Figure 3-7. Floodplains within the Surface Effects Area

3.2.3.2 Environmental Consequences

As a federal agency, TVA adheres to the requirements of EO 11988, Floodplain Management. The objective of EO 11988 is "to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative" (EO 11998, Floodplain Management). The EO is not intended to prohibit floodplain development in all cases, but rather, to create a consistent government policy against such development under most circumstances (U.S. Water Resources Council 1978). The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

3.2.3.2.1 The No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to floodplains. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR-OMM permit requirements (see Section 1.3 for previous environmental reviews that analyzed impacts from previously approved TVA-owned coal).

3.2.3.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining plan, which would result in surface disturbances and coal extraction-related effects. By adhering to the following mitigation measure, TVA's approval of the proposed mining plan and alteration of the terms of the coal lease agreement would comply with EO 11988, and there would be no significant impacts to floodplains and their natural and beneficial values.

- In future environmental reviews, TVA would analyze floodplain impacts, including the Floodplains No Practicable Alternative analysis, if applicable, prior to construction of each of the five Bleeder Shaft Facilities, and potential impacts would be avoided or minimized.

Surface Disturbances

Surface disturbances would include the construction of five bleeder shafts, use of an existing Coal Preparation Plant, and use of a proposed East Refuse Disposal Area.

The exact locations of the five Bleeder Shaft Facilities are not known at this time, as the locations are largely dictated by the underground mining operations as they occur. In a subsequent environmental review, TVA would analyze floodplain impacts of siting the five Bleeder Shaft Facilities, including the Floodplains No Practicable Alternative analysis, if applicable, prior to construction, and potential impacts would be avoided or minimized.

While floodplains occur within the surface effects area, the East Refuse Disposal Area is located outside of floodplains. Thus, no effects to floodplains are expected as a result of construction and operations of the East Refuse Disposal Area.

Coal Extraction-Related Effects

At the completion of longwall mining, subsidence would occur within the floodplains of Granny Creek/Sugar Camp Creek, Carlton Branch, and Sullivan Branch/Campbell Branch and several tributaries within the Shadow Area. Prior to reclamation, subsidence from

underground mining could temporarily increase the size of floodplains due to the decrease in surface elevation and alteration of drainage patterns. In addition, flood depths in existing floodplain areas could temporarily increase. Per IDNR-OMM requirements, Sugar Camp must correct any drainage changes caused by subsidence and repair any damage that may be caused by subsidence and subsidence-induced flooding. Construction of berms and/or dredging in advance of planned subsidence would protect land, dwellings, and other structures within potentially flooded areas (IDNR 2008).

Cumulative Effects

Cumulatively, a total of 6,555 acres of floodplains could experience a temporary increase in flood depth due to planned subsidence of 33,033 acres within the overall 37,972-acre SBR No. 6 expansion area. However, significant impacts to floodplains would not occur due to the application of the Floodplains No Practicable Alternative analysis and avoidance and minimization measures.

3.2.4 Water Quality

3.2.4.1 Affected Environment

CWA requires that states set water quality standards for all contaminants in surface waters. These standards are typically based on criteria recommended by USEPA. CWA also regulates the discharge of pollutants in surface waters. Section 303(d) of CWA requires states to identify all waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards and to establish priorities for the development of limits based on the severity of the pollution and the sensitivity of the established uses of those waters. Additionally, IDNR-OMM works closely with the IEPA Mine Pollution Control Unit to address environmental matters concerning mine operations, ensure permit requirements are met, and control pollution from mining activities.

IEPA has established water quality standards and designated uses for streams and lakes across the state, and issues periodic reports on waterbodies not meeting these standards and uses. Generally, characteristics considered during the assessments are temperature, dissolved oxygen, pH, nutrients, sedimentation, siltation, loss of habitat and contaminants. As part of this program, IEPA issues a list of impaired waters called the “303(d) List,” referring to Section 303(d) of the federal CWA. The Middle Fork Big Muddy River located within the Project Area is listed as impaired on the 2018 303(d) list due to dissolved oxygen, chloride, iron, mercury, and sedimentation/siltation (IEPA 2018).

Potential groundwater bearing bedrock strata in the Project Area include the Mt. Simon Sandstone, the Trivoli Sandstone, and the Anvil Sandstone. The Mt. Simon Sandstone is highly saline in Southern Illinois and is not used as a potable aquifer. Even though the Trivoli Sandstone is a widespread unit, rapid lateral facies changes occur which limits the Trivoli’s utility as a reliable aquifer (Willman 1975) and is quite saline. During the IDNR mine permitting process, residents in the area reported water quality to be good (HMG 2018). Additionally, the Illinois Groundwater Protection Act (IGPA) outlines a prevention-orientated process for monitoring and establishing groundwater protection standards. IGPA establishes partnerships with agencies like IPEA and IDNR to assist in compliance and enforcement of groundwater quality standards, as necessary (IGPA 2014).

IEPA and IDNR previously approved high chloride water treatment methods used at existing Sugar Camp Mine Number 1 facilities. As the longwall operation progress and the roof rock fractures, high chloride water is draining into the mine workings. The water is then

treated at a reverse osmosis plant. Approximately two million gallons per day (75 percent) of the treated water is pumped directly to a settling pond, where it is then utilized by the existing Coal Preparation Plant. Approximately 675,000 gallons per day (25 percent) of the treated water is disposed of in existing on-site deep injection wells or is deposited to the existing refuse disposal areas in the surface effects area. The existing refuse disposal areas were constructed with a low permeability liner that restricts the groundwater flow into and out of the refuse disposal areas.

Sugar Camp Mine holds a NPDES permit issued by IEPA to discharge water from 14 existing outfalls from sedimentation ponds associated with the existing refuse disposal areas and one existing sanitary wastewater discharge (Appendix B). The NPDES permit covers discharge limitations, monitoring, and reporting requirements and details specific conditions for each outfall.

3.2.4.2 Environmental Consequences

3.2.4.2.1 The No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to water quality. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be mitigated, per IDNR-OMM permit requirements.

The mining and processing of previously approved TVA-owned coal and privately owned coal would continue to operate and discharge water via the 15 outfalls permitted by the NPDES permit and as monitored by IEPA. A revision to the NPDES permit would be required to add additional surface water discharge outfalls and groundwater wells to monitor the potential effects of the East Refuse Disposal Area. Thus, water quality impacts associated with the current mining and processing of previously approved TVA-owned coal and privately owned coal would continue to be avoided or corrected.

3.2.4.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining. This may result in temporary impacts to water quality due to surface disturbances, mining operations, and planned subsidence and mineralization in the Shadow Area and adjacent areas.

Regular and ongoing water quality sampling at the 15 existing outfalls within the surface effects area is conducted per certain conditions detailed in the NPDES permit. Conditions of the permit require that wells be monitored for potential effects to groundwater from the 15 permitted discharges. When a release of water from permitted discharge points registers one or more parameters above the water quality standard, mine personnel correct the non-compliant situation and also provide applicable reports to IEPA. IDNR-OMM provides oversight and monitoring of Sugar Camp activities and would take appropriate enforcement actions to remedy any violations.

Surface Disturbances

Construction and operations activities related to the Bleeder Shaft Facilities and the East Refuse Disposal Area have the potential to affect surface water quality via stormwater runoff. Erosion and sediment loading leaving these areas could affect the quality of small streams. However, with proper sediment and erosion controls, sediment loading and the introduction of pollutants to the receiving waters would be minimized. During the initial

construction, sediment would be managed through the use of erosion and sediment control best management practices (BMPs), as required by the NPDES permit. Sediment would be managed through the use of erosion control practices (e.g., seeding, straw, mulch, or vegetative cover) as well as fugitive dust minimization (e.g., wetting roads prior to heavy use). Runoff would be managed through the use of sediment control practices (e.g., silt fence, wattles, or hay bales) as well as water quality protection measures (e.g., sedimentation ponds or establishment of riparian zone buffer zones) as necessary. Embankments or cut and fill slopes would be permanently seeded and stabilized and not affected during the life of mining operations. Thus, effects to surface water quality due to construction activities related to new surface disturbances would be insignificant.

The East Refuse Disposal Area would be constructed similarly to the existing refuse disposal areas by installing a low permeability liner. The liner would restrict the groundwater flow into and out of the East Refuse Disposal Area. A revision to the NPDES permit would be required to add additional surface water discharge outfalls and groundwater wells to monitor the potential effects of the East Refuse Disposal Area and any new outfalls associated with existing refuse disposal areas on surface water and groundwater quality.

Sugar Camp has established a surface water quality monitoring program as part of the UCM Permit No. 382 to provide sufficient lead time for notification of any potential impacts, as well as to provide ample time for investigation and mitigation of any impacts prior to reaching off-site surface waters. The monitoring program is dynamic as such, that IDNR reserves the right to add monitoring parameters and locations should the need arise. IDNR-OMM's hydrogeologic assessment concluded that the proposed operations within the Shadow Area would not have negative impacts on surface water regimes.

Coal Extraction-Related Effects

Mining can affect surface water quality by increasing sedimentation, nutrient and pesticide loading, and acidic drainage (caused by increasing sedimentation, nutrient loads, manganese, or total dissolved solids from the mined material and reclamation activities). UCM Permit No. 382 SBR No. 6 states that the potential mining-related impacts to surface water in the area encompass approximately 4 to 8 percent of the Middle Fork Big Muddy River Watershed. Water quality impacts would be negligible due the volume of water contributing to the Middle Fork Bid Muddy River at the confluence with both Akin Creek and Sugar Camp Creek. Sugar Camp has established a stream sampling point downstream of the three streams to monitor surface water quality.

The proposed longwall mining in the Shadow Area is expected to cause surface subsidence of approximately 10,549 acres. The mining panels run east to west, while local streams in the northern Shadow Area tend to flow north to south toward Middle Fork Big Muddy River and Akin Creek. Ewing Creek flows northeast to southwest in the southern Shadow Area. Local streams north of Ewing Creek tend to flow north to south, and local streams south of Ewing Creek tend to flow south to north. The subsidence troughs would be oriented either perpendicular to or diagonal to the direction of stream flow in the northern and southern Shadow Areas. Prior to reclamation, subsidence related changes to the topography of the Shadow Area may produce short term surface depressions with localized ponding of surface water or interception of groundwater where the water table is near the surface. Sugar Camp has developed a subsidence mitigation plan that will re-approximate pre-mining drainage patterns by grading and/or filling to drain areas with standing waters.

Per IDNR-OMM requirements, surface water and groundwater quality will be routinely monitored, and any impacts to water quality would be corrected by Sugar Camp. Adequate clean water would be supplied to the parties affected until corrected.

Cumulative Effects

Cumulatively, significant impacts to water quality due to the overall 37,972-acre SBR No. 6 mine expansion and ongoing and proposed actions in the existing 2,420-acre surface effects area would be avoided with implementation of the IDNR-OMM-required groundwater monitoring program, water quality sampling activities, and reclamation plan. A cumulative hydrologic impact assessment done by IDNR for the entire UCM Permit No. 382 shadow area and nearby permitted areas found that the mining operations were designed to prevent material damage to the hydrologic balance in the permit areas and surrounding vicinities.

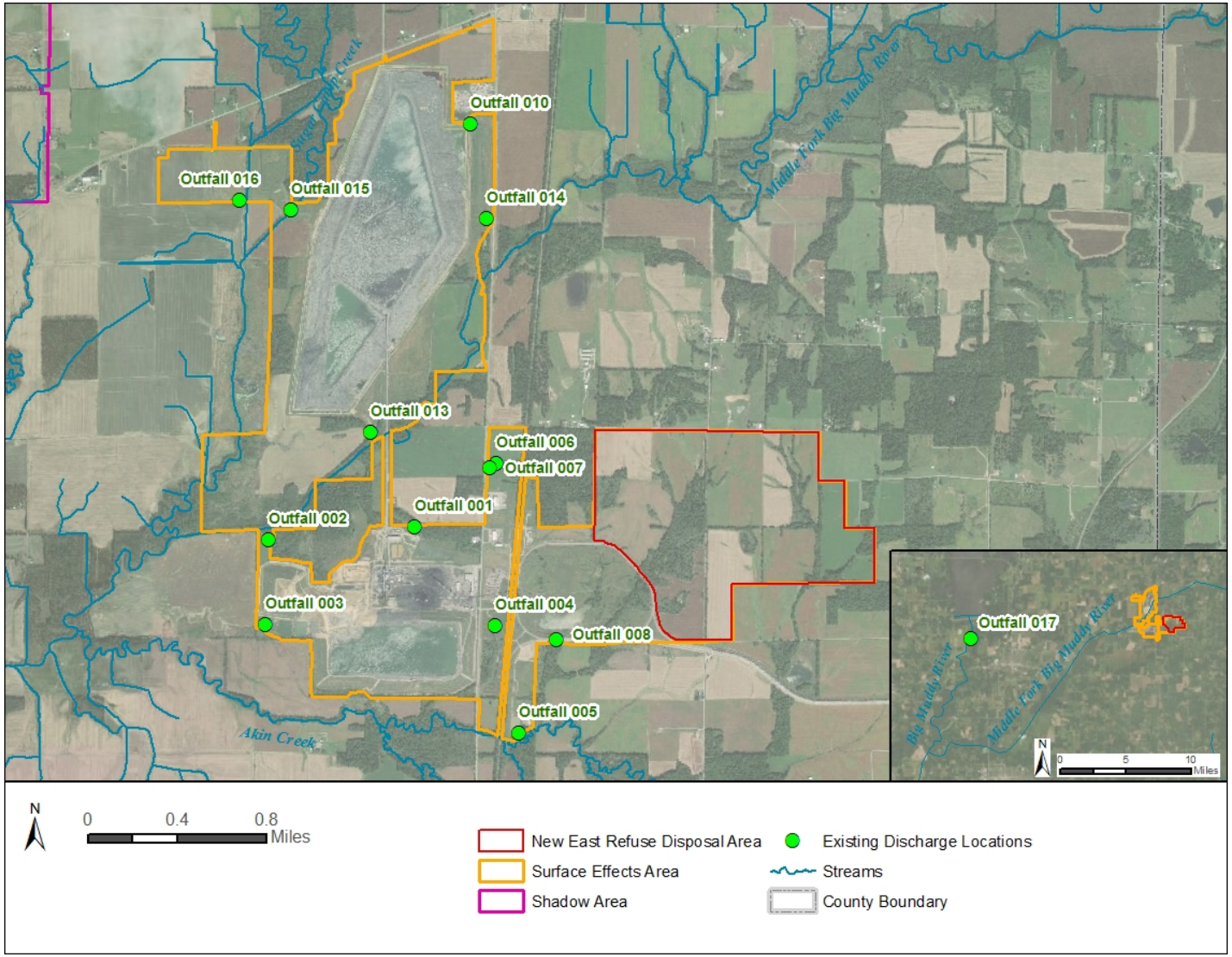


Figure 3-8. Existing Discharge Locations associated with Sedimentation Ponds within Surface Effects Area

3.2.5 Water Supply

3.2.5.1 Affected Environment

The Project Area is served by public utility water by the Macedonia Water System, the Ewing-Ina Water Commission, Akin Water District, and Hamilton County Rural Water District. The source of the water supply for these water districts is Rend Lake, located approximately three miles west of the northern Project Area. The other known public water supply sources within ten miles of the Project Area are the Rend Lake Inter-City Water System and the Corinth Water District. Public water supply lines occur within the Project Area, as discussed in Section 3.8.

Of the 55 wells and 17 cisterns reported, 39 were reported to be used for household or drinking water, and 11 were reported to be used for livestock, gardening, or agricultural uses (Table 3-1; Figure 3-9; HMG 2018). Twenty-two of the wells or cisterns were reported as no longer used. One well was reported within the surface effects area (see Figure 3-15 in Section 3.8.2.2).

Table 3-1 lists the wells and cisterns located within the Shadow Area.

Table 3-1. Water Usage in the Shadow Area

Type	Frequency
Domestic Wells (Drinking or household use)	39
Wells (purposes other than drinking or household use)	8
Wells (no longer used)	8
Cisterns (purposes other than drinking or household use)	3
Cisterns (no longer used)	14

Source: HMG 2018

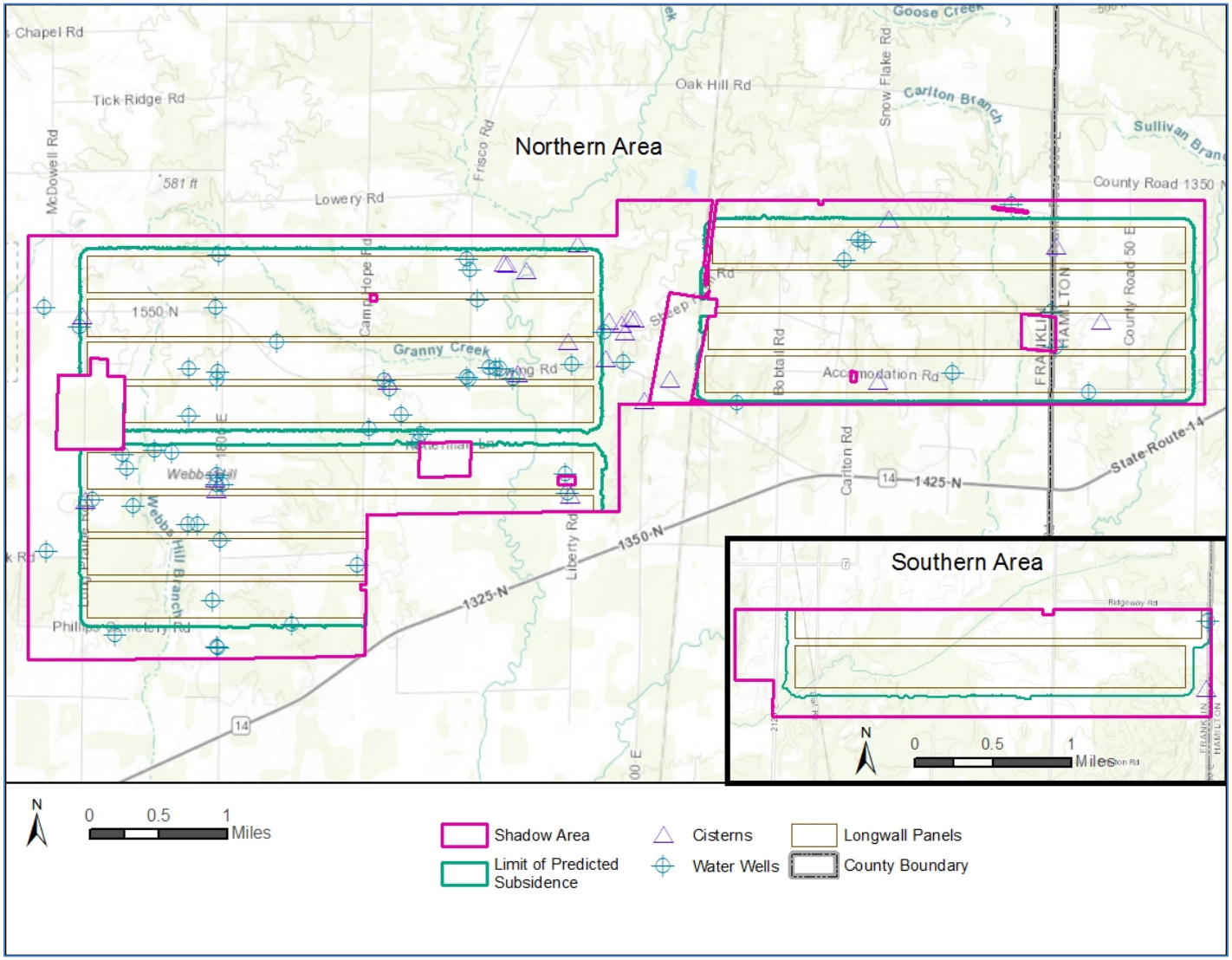


Figure 3-9. Wells and Cisterns within the Shadow Area

3.2.5.2 Environmental Consequences

3.2.5.2.1 The No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to water supply. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR-OMM permit requirements.

The mining and processing of previously approved TVA-owned coal and privately owned coal would continue to utilize water supplied from Rend Lake. Additionally, Sugar Camp would monitor wells to detect decreases in water supply. Sugar Camp would remediate adverse effects to the water supply sources in their permitted mining areas. This remediation could include supplying residents and businesses with adequate clean water.

3.2.5.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining. This may result in temporary impacts to water supplies due to planned subsidence in the Shadow Area. Potential effects to water supplies or availability would be mitigated, per IDNR-OMM requirements.

Surface Disturbances

No effects to water supplies would occur from surface disturbances related to the construction and operations of the Bleeder Shaft Facilities and the East Refuse Disposal Area. The existing Coal Preparation Plant utilizes water supplied from Rend Lake, approved by TVA for the processing of TVA-owned coal under a prior review.

Coal Extraction-Related Effects

Subsidence could cause either an increased or decreased flow to water wells, depending on how the rock layers fracture. No major surficial aquifers have been recorded within the Project Area vicinity; however, a bedrock aquifer associated with Pennsylvanian sandstone in the depth range of 200 to 360 feet below ground surface is utilized as a water source for domestic and farm use in the area. Pre-subsidence monitoring of identified wells for quality and quantity would be completed with the permission of the landowners. As a condition of the mining permit, any decrease in water quality or quantity during mining operations would be corrected by Sugar Camp, and adequate clean water would be supplied to the parties affected until the correction was made. This may include connection to a public water supply. Potential effects to water supplies or availability would be minor and mitigated, per these IDNR-OMM requirements.

The water level in the Project Area wells may be impacted by subsidence, but the chance of this type of impact is low because of the depth of the Herrin No. 6 coal seam and the rapid water level recovery in shallow water wells after subsidence (Booth and Spande 1992). Sugar Camp would be required to promptly replace any drinking, domestic, or residential water supply that becomes contaminated or interrupted by mining activities (62 Illinois Administrative Code 1817.4(j)) (IDNR 2008). Wells that do not have a specific agreement already in place to address post-subsidence water supply issues must be monitored by Sugar Camp to obtain adequate seasonal data sufficiently in advance of potential impacts due to subsidence (IDNR 2008). Per the UCM application process, Sugar Camp signed an affidavit confirming that all documents and rights bestowed to legally conduct subsidence

would be provided by IDNR-OMM. This would include any missing agreements for water wells and the associated sampling.

Cumulative Effects

There are 115 wells or cisterns that are used for household or drinking purposes within the 37,972-acre SBR No. 6 expansion area. Cumulative impacts to water supply would either be avoided or would be minor and temporary due to implementation of IDNR-OMM-required groundwater monitoring and remediation of any decreases in water supply. A cumulative hydrologic impact assessment done by IDNR for the entire UCM Permit No. 382 shadow area and nearby permitted areas found that the mining operations were designed to prevent material damage to the hydrologic balance in the permit areas and surrounding vicinities.

3.3 Air Quality and Greenhouse Gases

This section describes the potential affects to air quality and greenhouse gases. Potential effects were identified using a combination of USEPA data and literature references.

3.3.1 Air Quality

3.3.1.1 Affected Environment

As required by the Clean Air Act and its amendments, the U.S. Environmental Protection Agency (EPA) has established primary and secondary National Ambient Air Quality Standards (NAAQS) for six principal air pollutants, which are called “criteria” pollutants. These include carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (including inhalable particulate matter [particulate matter with an aerodynamic diameter below 10 micrometers (µm), or PM_{10}] and fine inhalable particulate matter [particulate matter with an aerodynamic diameter below 2.5 µm, or $PM_{2.5}$]), sulfur dioxide (SO_2), and lead (Pb). Primary standards set limits to protect public health, including the health of sensitive populations, such as asthmatics, children, and the elderly. The secondary standards are set to protect against effects on public welfare, including damage to structures, crops, and ecosystems. The primary and secondary NAAQS are provided in Table 3-2.

Table 3-2. National Ambient Air Quality Standards

Pollutant	Primary / Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)	primary	8 hours	9 ppm	Not to be exceeded more than once per year
		1 hour	35 ppm	
Lead (Pb)	primary and secondary	Rolling 3 month average	0.15 µg/m^3 [1]	Not to be exceeded
Nitrogen Dioxide (NO_2)	primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	primary and secondary	Annual	53 ppb [2]	Annual Mean
Ozone (O_3)	primary and secondary	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years

Pollutant	Primary / Secondary	Averaging Time	Level	Form
Particulate Matter ($PM_{2.5}$)	primary	Annual	12.0 µg/m^3	annual mean, averaged over 3 years
	secondary	Annual	15.0 µg/m^3	annual mean, averaged over 3 years
	primary and secondary	24-hours	35 µg/m^3	98th percentile, averaged over 3 years
Particulate Matter (PM_{10})	primary and secondary	24-hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)	primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	secondary	3-hours	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA 2019a.

1 In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.

2 The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

The Clean Air Act requires EPA to determine whether an area is in attainment (regions where a given pollutant's concentration is at or below the established NAAQS) or nonattainment (regions where a given pollutant's concentration is above the established NAAQS). These designations are based on air quality data collected from monitors located in urban and rural settings as well as other information such as dispersion modeling. Franklin and Hamilton counties are currently designated as in attainment for all NAAQS (USEPA 2019b).

3.3.1.2 Environmental Consequences

3.3.1.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Therefore, the direct and indirect emissions of air pollutants associated with the proposed mining of the approximately 186 million tons of unprocessed TVA-owned coal, with approximately half (i.e., 92.8 million tons) of that coal sent to market as processed coal, would not occur. Direct and indirect emissions of air pollutants from the ongoing mining of approximately 359 million tons of unprocessed previously approved TVA-owned coal and privately owned coal would continue, under terms of the SBR No. 6 permit issued by IDNR-OMM.

3.3.1.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed plan to extract TVA-owned coal primarily during the years 2024 to 2031 and 2036 to 2040. Although the annual quantity of TVA-owned coal extracted varies, for purposes of this analysis it is assumed to

average 7.1 million tons of processed coal (14.2 million tons of unprocessed coal) per year. Mining of privately owned and previously approved TVA coal would occur simultaneously, with a total of 14 million processed tons mined annually including an assumed annual average of 9.5 million tons of processed privately owned and TVA-approved coal during the years when the proposed TVA-owned coal would be mined.

Direct impacts to air quality from mining of the underground coal would continue in amounts similar to those currently experienced; several indirect impacts to air quality would also continue to occur. The main direct source of criteria pollutant emissions associated with the mining operations is the operation of the Coal Preparation Plant. Based on the USEPA emissions inventory database (USEPA 2019c), the Coal Preparation Plant emitted a total of 40.65 tons of PM_{10} and 10.814 tons of PM_{10} in 2017 (no other criteria pollutant emissions were reported). In that year the mine produced 12,812,197 tons of processed coal (USEIA 2019), which results in emission factors of 0.0063 lb PM_{10}/ton processed coal produced and 0.0017 lb $PM_{2.5}$/ton processed coal produced. Using these emission factors the direct PM_{10} and $PM_{2.5}$ emissions associated with the Action Alternative are approximately 22 tons per year and 6 tons per year, respectively.

Under the Action Alternative, the potential downstream consumers of this coal would burn that coal for energy generation or other industrial purposes resulting in indirect emissions of criteria and hazardous air pollutants (HAPs), as defined and regulated by USEPA. Transportation and handling of the coal to and by the end users would also continue to generate emissions of air pollutants.

During the period 2014 through 2018, between 53 percent and 77 percent of the coal produced by the mine has been shipped to a number of power plants located in the United States including facilities located in Alabama, Florida, Georgia, Indiana, Kentucky, Mississippi, and Ohio, with the remainder delivered to various global commodities firms (USEIA 2019). Some of the coal delivered to the commodities firms is likely exported from the U.S. However, any or all of the mined coal could be used by any combination of these facilities, other domestic facilities, or any international power plant or other user.

The indirect emissions resulting from transportation of the coal to end users were estimated based on information obtained from USEIA (2019) for coal shipments from the mine to domestic power plants in 2018, estimated rail distances to those sites (NS 2011), and rail locomotive emission factors developed by USEPA (USEPA 2009). The ultimate destination and shipment methods for the remainder of the coal mined in 2018 (i.e., purchased by commodities firms) is unknown and beyond the control of TVA. Any attempt to quantify the amount of this coal, if any, that is exported abroad would be highly speculative and add no value to the environmental review. To account for the transportation-related indirect emissions, the results for the 2018 domestically shipped coal were used to estimate transportation-related emissions of that portion of the coal mined, as there are data to estimate such emissions.

To analyze potential indirect emissions resulting from combustion of the mined coal, a range was developed for the indirect emissions to account for the variety of boiler and control equipment configurations in which the mined coal may be combusted. This range has a lower bound based on combustion of the coal in a modern, highly controlled facility (i.e., new domestic) and an upper bound based on combustion of the coal in a boiler equipped with control equipment required to comply with 40 CFR 60, Subpart Da (USEPA 2019d - older domestic boilers) and USEPA 1998. Emissions associated with coal

combusted in foreign boilers or other combustion devices are assumed to be adequately represented by the upper bound values.

The range of direct and indirect criteria and select HAP (i.e., mercury, hydrogen chloride and hydrogen fluoride) emissions resulting from the transportation and downstream combustion of the average of 7.1 million tons per year of TVA-owned coal extracted from the Project Area are quantified in Table 3-3.

Table 3-3. Estimated Direct and Indirect Air Pollutant Emissions (tpy)

Pollutant	Direct	Transportation	Combustion	Total	2014 National Emissions Inventory	% of Total
NO_x	NA	273	6,195 – 53,101	6,468 – 53,374	12,595,526	0.05 – 0.42
CO	NA	260	11,505 – 17,750	11,765 – 18,010	65,646,029	0.02 – 0.03
PM_{10}	22	3.9	2,390 – 2,726	2,416 – 2,752	18,197,553	0.01 – 0.02
$PM_{2.5}$	6	3.9	2,390 – 2,726	2,416 – 2,752	5,391,936	0.04 – 0.05
VOC	NA	9.7	301 – 391	311 – 400	16,912,756	0.002 – 0.002
SO_2	NA	0.9	8,408 – 13,275	8,409 – 13,276	4,675,008	0.18 – 0.28
Hydrogen chloride	NA	NA	71 – 426	71 – 426	Not reported	NA
Hydrogen fluoride	NA	NA	35 – 53	35 – 53	Not reported	NA
Mercury	NA	NA	0.15 – 0.29	0.15 – 0.29	52	0.28 – 0.57

Table 3-3 also provides the corresponding emission level of these pollutants at the national level (where available) for 2014 (USEPA 2019e, the most recent year for which information is available). Comparing the direct and indirect emissions of these pollutants from the Action Alternative to the corresponding emissions of the same pollutants at the national level provides a reasonable proxy for assessing potential downstream air quality impacts at a regional or larger scale. The direct and indirect emissions of each criteria pollutant and select HAPs as a result of coal mining and the downstream combustion of the extracted coal is estimated to be between 0.002% and 0.57% of the total US emissions of those pollutants in 2014.

The downstream combustion of the mined coal is, and would continue to be, subject to applicable regulations under the Clean Air Act and corresponding state statutes and regulations addressing air quality, including the New Source Performance Standards, Mercury and Air Toxics Standards, Regional Haze rules, and standards developed under respective State Implementation Plans (SIPs) to achieve and maintain the NAAQS.

Cumulative Effects

Cumulatively, the direct and indirect emissions of each criteria pollutant and select HAPs as a result of mining and the downstream combustion of the extracted coal from the overall 37,972-acre SBR No. 6 mine expansion is estimated to be between 0.004 percent and 1.1 percent of the total U.S. emissions of those pollutants in 2014.

3.3.2 Greenhouse Gases

3.3.2.1 Affected Environment

Greenhouse gases (GHGs) are chemical compounds in the atmosphere that absorb a portion of the outgoing longwave radiation and emit it back to the surface, thus affecting the Earth's energy balance. For purposes of quantifying their emissions and potential effects, the various GHGs are frequently converted to a carbon dioxide equivalent (CO_2e) basis using a GHG-specific multiplier called the global warming potential (GWP). The GWP for a particular greenhouse gas is the estimated ratio of surface warming caused by one unit mass of the greenhouse gas to that of one unit mass of carbon dioxide (CO_2) over a specified time period, typically 100 years. For calculation purposes, the methane GWP of 28 found in EPA's greenhouse gas reporting program (GHGRP) implemented by 40 CFR Part 98 was used. One source of methane is coalification (the formation of coal in the earth). After the methane is formed, much of it remains within coal seams until the coal encasing the methane is fractured and exposed. Coal mining releases this methane, referred to as coal mine methane (CMM) as opposed to the methane that remains in the seam, referred to as coal bed methane (CBM) (USEPA 2018). Although the methane contained in coal is formed naturally, the CMM is considered a man-made source because the methane would have remained within the coal seam if it had not been exposed by mining. While CMM is a large source of man-made methane emissions in the United States, EPA estimates that emissions decreased by 40 percent between 1990 and 2015 (USEPA 2018).

In 2009, EPA implemented the GHGRP applicable to large GHG emission sources. The goal of the rule is to collect accurate and comprehensive emissions data to inform policy makers, and to potentially assist in developing a cap and trade system. The GHGRP applies to certain specifically listed source types, any facility in a listed source category whose GHG emissions exceed 25,000 metric tons of carbon dioxide equivalent ($MTCO_2e$) per year, and certain listed fuel suppliers. The GHGRP applies to underground coal mines that liberate more than 36,500,000 actual cubic feet of methane per year. If a facility's emissions are greater than this threshold in calendar year 2010 or beyond, then it must begin monitoring, recording and reporting the GHG emissions annually beginning January 1, 2011. In 2017 the emissions reported by over 8,000 facilities under the GHGRP accounted for 85-90% of total U.S. GHG emissions (USEPA 2019f). The existing Sugar Camp Energy LLC mine site is currently subject to the GHGRP.

GHG emissions have the potential to affect both global and regional climate. Not only do GHGs potentially affect climate, but changes in climate can affect the extent of atmospheric dispersion and photochemical production of air pollutants. For example, higher temperatures tend to increase the photochemical production of ozone.

Based on climate data from Mt. Vernon, Illinois, approximately 20 miles north of the Project Area, the coldest month is January, with average maximum and minimum temperatures of approximately 38 degrees Fahrenheit (°F) and 21°F, respectively. The warmest month is typically July, with average maximum and minimum temperatures of approximately 86°F

and 67°F, respectively. Annual precipitation averages 43.4 inches per year, with April and May tending to have the highest monthly precipitation (National Oceanic and Atmospheric Administration (NOAA) 2020a). Average annual snowfall is around 14 inches per year at Mt. Vernon. On average, approximately 54 tornados occur in Illinois in a year (NOAA 2020b).

Figure 3-10 is a chart of annual average temperatures over the 124-year period of record (1896 through 2019) for Mt. Vernon, Illinois, based on the NOAA database maintained by the Iowa Environmental Mesonet (IEM 2020). The trend line on the chart, as indicated by the embedded line slope equation, shows a decrease of approximately 2°F in average temperature over the period of record. Annual average precipitation has increased over the period of record by approximately 10 percent, based on data reported for Mt. Vernon (IEM 2020).

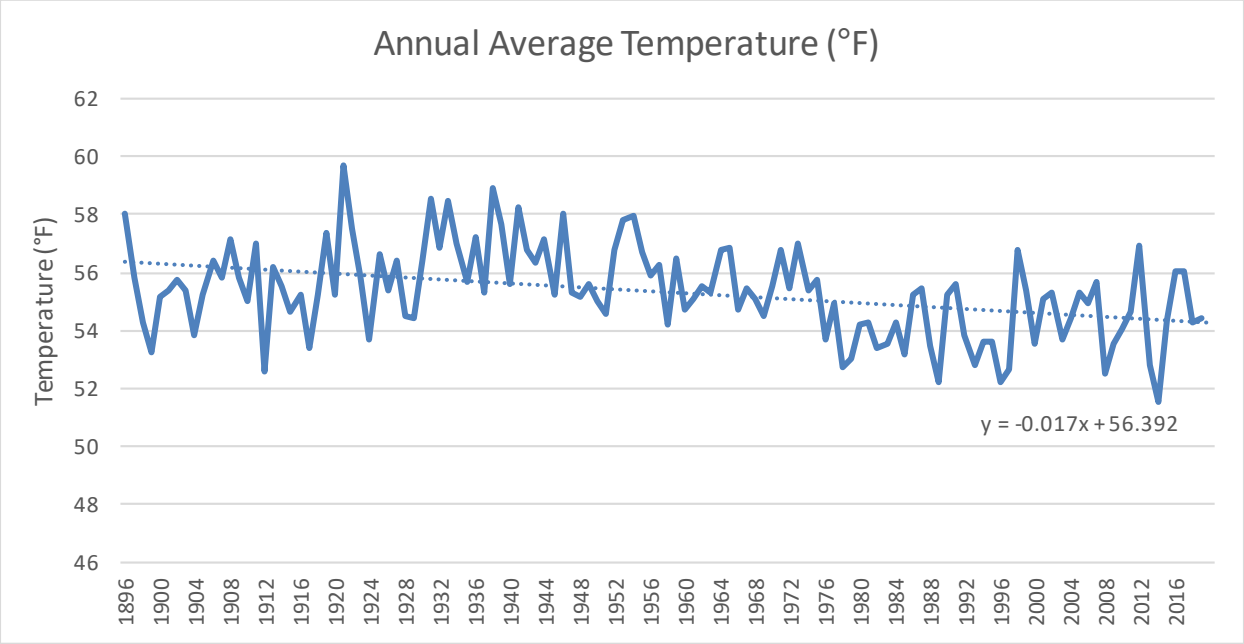


Figure 3-10. Annual Average Temperature for Mt. Vernon, IL over 124-Year Record (source: IEM 2020)

Statewide, the average annual temperature has increased by about 1°F since the beginning of the twentieth century (Frankson et al. 2017, Angel 2019). Most of this increase has been during the winter and spring, when average temperatures have increased 2°F. Average summer temperatures have shown little change and the number of very hot summer days has decreased, as have very cold winter nights. Statewide annual precipitation has varied widely but has been above average since 1990.

3.3.2.2 Environmental Consequences

3.3.2.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed SBR No. 6 mining plan for the extraction of TVA-owned coal in the Shadow Area. Therefore, the direct emissions of GHGs associated with the proposed mining of the approximately 186 million tons of TVA-owned coal, with approximately half (i.e., 92.8 million tons) of that coal sent to market as processed coal, would not occur. Similarly, the direct and indirect emissions of GHGs would also not occur. Direct and indirect emissions of GHGs from the ongoing

extraction of approximately 359 million tons of unprocessed TVA-approved coal previously approved for mining and privately owned coal, under terms of the mining permit issued by IDNR-OMM.

The majority of the energy that would have been produced by the proposed TVA-owned coal would most likely be replaced by alternate energy sources (including privately owned and TVA-approved coal from the mine as well as coal from other production areas). While the production and consumption of those replacement energy sources would have associated GHG emissions, the emissions from the replacement sources of energy are unknown because they would not be under TVA's control. For the purposes of analysis, TVA assumes that the No Action Alternative could result in actions to be taken by Sugar Camp and other entities, ranging from complete replacement of the coal mined from the Project Area to no replacement. TVA anticipates that GHG emissions would be less under the No Action Alternative than under the proposed Action Alternative because, typically, coal combustion is more carbon intensive per unit energy than other forms of fossil fuels, or non-fossil energy sources.

3.3.2.2.2 Action Alternative

Under the Action Alternative, TVA would approve Sugar Camp's mining plan expansion to extract the TVA-owned primarily during the years 2024 to 2031 and 2036 to 2040. Although the annual quantity of TVA-owned coal extracted varies, for purposes of this analysis it is assumed to average 7.1 million tons of coal per year. Mining of privately owned and previously approved coal would occur simultaneously, with a total of 14 million tons mined annually including an assumed annual average of 9.5 million tons of privately owned and TVA-approved coal during the years when the proposed TVA-owned coal would be mined.

This would result in emissions of GHGs from the coal extraction, transportation of the coal to end users, and the eventual combustion of the extracted coal. The following emissions analysis provides an estimate of GHG emissions as (1) a percentage of GHG emissions reported through the GHGRP; (2) a percentage of total U.S. GHG emissions; and (3) a percentage of total global GHG emissions. This proportionate estimate of GHG emissions serves as a reasonable proxy for assessing potential climate change impacts. The current state of climate science does not allow for specific linkage between particular GHG emissions and particular localized climate impacts.

The use of the information currently available (i.e., use of the emissions analysis described below as a proxy for climate impacts) is consistent with 40 CFR § 1502.22(b) of the Council on Environmental Quality's (CEQ) NEPA regulations. While GHG emissions from the mining of the TVA-owned coal and the downstream combustion of that coal would affect climate, the pro-rata effect cannot be determined with precision. Even so, other information (i.e., emissions analysis at national and global level) that can credibly be calculated is included to serve as a reasonable proxy of the Proposed Action's contribution to climate change.

TVA also considered using the social cost of carbon (SCC) metric in the assessment of climate change impacts on downstream GHG emissions resulting from combustion of coal. However, after due consideration, TVA believes that the SCC metric is not an appropriate measure or proxy of Project-level climate change impacts and their significance under NEPA. The SCC metric is not appropriate or informative because (1) the SCC tool does not measure the actual incremental impacts of a project on the environment and (2) there are

no established criteria identifying the monetized values considered significant for NEPA purposes.

Direct Emissions – Mining Operations
In 2018, the GHGRP information submitted by Sugar Camp Energy, LLC reported emissions of 972,861 metric tons CO_2e ($MTCO_2e$) (USEPA 2019g) and separately reported total coal production of 14,460,951 short tons (tons) of processed coal (USEIA 2019), including both TVA-owned and privately owned coal. Based on this information, the CMM emissions rate by existing mine operations is estimated as 0.07 $MTCO_2e$/ton processed coal produced.

The operation of mining coal equipment would also generate GHG emissions. The GHG emissions associated with operation of the mining equipment are anticipated to be negligible compared to the CMM and coal combustion emissions and are not quantified.

Indirect Emissions – Coal Combustion
Assuming that all of the coal extracted from the mine is combusted downstream, the associated GHG emissions were calculated using emission factors and GWP values for bituminous coal, as provided in the GHGRP rule at 40 CFR Part 98. The GHG emissions associated with the rail transport were estimated using the methodology described in Section 3.3.1 for criteria air pollutants.

Total GHG Emissions
Table 3-4 summarizes the maximum projected annual GHG emissions associated with the Action Alternative. The total life-of-mine direct and indirect GHG emissions associated with the 92.8 million tons of processed coal is 224,970,018 $MTCO_2e$.

The projected direct annual CMM emissions associated with the proposed mining of TVA-owned coal represent approximately 0.02% of the 2.99 billion $MTCO_2e$ of U.S. GHG emissions reported through the GHGRP (USEPA 2019h) for 2018 and 0.0074% of the estimated 6.46 billion $MTCO_2e$ of total U.S. GHG emissions (USEPA 2019i) for 2017. The total annual (i.e., direct and indirect) emissions from the proposed mining of TVA-owned coal represent approximately 0.3% of the total US GHG emissions for 2017 and 0.03% of the estimated 51.8 billion $MTCO_2e$ of total global GHG emissions (excluding land-use change contributions) for 2018 (Olivier and Peters 2019).

Table 3-4. Action Alternative GHG Emissions

Anticipated Annual Average Coal Production			7,100,000	tons
Bituminous Coal Heat Content:			24.93	MMBtu/ton [a]
			177,003,000	MMBtu
GHG	GWP [b]	Emission Factor [c]	Emissions (MT)	Emissions ($MTCO_2e$)
Direct Emissions - Mining Operations [d]				
CH_4	25	0.07 MTCO2e/ton coal		477,653
Indirect Emissions - Combustion				
CO_2	1	93.28 kg/MMBtu	16,510,840	16,510,840
CH_4	25	1.1E-02 kg/MMBtu	1,947	48,676
N_2O	298	1.6E-03 kg/MMBtu	283	84,395
CO_2e				16,643,911
Indirect Emissions - Transportation				
CO_2e				90,582
CO_2e (Total)				17,212,146

[a] 40 CFR Part 98, Table C-1, reflecting the update effective January 1, 2014.
[b] 40 CFR Part 98, Table A-1, reflecting the update effective January 1, 2014.
[c] 40 CFR Part 98, Tables C-1 and C-2, reflecting the update effective January 1, 2014.
[d] Calculated using information from USEIA 2019 and USEPA 2019f.

Climate Effects

Given the Proposed Action's very small percentage increase in global GHG emissions, the effects of the action's GHG emissions on global or regional climate would be immeasurably small. Microclimate or regional climate effects can also occur with changes in land use, for example, as with urban heat islands. Because the Proposed Action would cause only very minor changes in land use over relatively small areas, no significant heat island or other local climate changes are expected with implementation of the Proposed Action.

Cumulative Effects

Cumulatively, the emissions of GHGs from future mining associated with the overall 37,972-acre SBR No. 6 mine expansion, including the TVA-owned coal associated with the Proposed Action, would total about 660 million metric tons of CO_2e.

3.4 Biological Environment

This section describes the potentially affected environment for wildlife, vegetation, aquatic life, and threatened and endangered species. Biological resources were identified using a combination of the IDNR Natural Heritage Database, USFWS Information for Planning and Consultation (IPaC), the 2016 National Land Cover Database (NLCD) maintained by USGS, and literature references.

Terrestrial habitats within the Project Area in Franklin and Hamilton counties are characterized by a heavily fragmented landscape dominated by early successional habitat. Early successional habitats in the Project Area include fields (e.g., pastures and hayfields) and cultivated row crops (e.g., corn, soybeans, or wheat). Based on recent aerial imagery, this early successional habitat is interspersed with forested fragments associated with riparian zones bordering tributaries to Granny Creek, Carlton Branch, Web Hill Branch, Sugar Camp Creek, Campbell Branch, Sullivan Branch, Middle Fork Big Muddy River, Ewing Creek, and ponds.

3.4.1 Vegetation

3.4.1.1 Affected Environment

Southern Illinois was once covered by a mosaic of oak-hickory forests and bluestem prairies, but most of the area has been converted to agricultural lands. Soybeans, corn, and wheat are the primary crops, and forested areas are now largely confined to side slopes and river bottoms that are unsuitable for farming (Woods et al. 2006). Mesic tall-grass prairies are found in a mosaic pattern with the oak-hickory forest. Flatwood forests can be found on nearly level, clay-rick soils of poorly drained uplands.

Two globally rare flatwoods terrestrial plant communities are found in this region: the Pin Oak (*Quercus palustris*) – Post Oak (*Quercus stellata*) Lowland Flatwoods bottomland community and the Post Oak Flatwoods community. The Pin Oak – Post Oak Lowland Flatwoods bottomland community occurs on terrace “flats” in the floodplains of major rivers, primarily the Ohio River and the Mississippi River and tributaries (Natureserve 2019). This bottomland community is thought to have less than 20 occurrences throughout its range within southwest Indiana, southern Illinois, and southeast Missouri. Due to damming, higher water levels in their preferred locations may have eliminated post oak from most occurrences of this community (Carey 1992, Natureserve 2019). These lowland flatwoods have been classified as having a vulnerable to imperiled global conservation status (Natureserve 2019). The Post Oak Flatwoods community also has a vulnerable to imperiled global conservation status with fewer than 50 occurrences throughout its range (Natureserve 2019). Some occurrences have been destroyed or degraded by clearing and selective logging, and some have been degraded by grazing. This community typically has a dominant tree layer with an average canopy cover of 80 percent or more. Trees may be stunted due to the unfavorable soil conditions.

Based on the 2016 NLCD, approximately 2,099 acres of deciduous forests (17 percent) occur within the Project Area. Most of the forested areas are heavily fragmented and concentrated around streams, with several bottomland forests present. Dominant species across the Project Area include northern red oak, silver maple, and various hickory species (Alliance Consulting 2018). Species such as sycamore, red maple, sweet gum, and river birch are also common along stream corridors in this region. Most of the forested areas range in size from less than one acre to 60 acres. Common understory species include coralberry, Japanese honeysuckle, and Christmas fern, with American beech saplings being common along the north facing slopes. At the location of the East Refuse Disposal Area, vegetation is generally mixed mesophytic forests of second or third growth timber, dominated by red oak, hickory species, and silver maple (Alliance Consulting 2019b). To date, no uncommon or rare plant communities have been documented during field surveys in the Project Area.

Based on the 2016 NLCD, the majority (48 percent; 6,069 acres) of the Project Area is in cultivated crops. Pasture lands and fields in hay compose approximately 30 percent (3,785 acres) of the Project Area. Remaining vegetative cover in the portions of the Project Area that would be disturbed by the Project consists of herbaceous plants (one percent; 139 acres and woody wetlands (less than one percent; 2.8 acres).

3.4.1.2 Environmental Consequences

3.4.1.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to vegetation. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR-OMM permit requirements.

Existing plant communities at each of the 5.3-acre bleeder shaft facility locations and the 525-acre East Refuse Disposal Area site would be eliminated for the construction and operations of these mine components. The sites of the bleeder shaft facilities and the East Refuse Disposal Area would be reclaimed or capped, respectively, as described in Section 2.1.2.3. Impacts to vegetation as a result of subsidence are not anticipated.

3.4.1.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining plan. This would result in impacts to vegetation due to surface disturbances and planned subsidence.

Surface Disturbances

Existing plant communities at each of the 5.3-acre Bleeder Shaft Facility locations and the 525-acre East Refuse Disposal Area would be eliminated for the construction and operations of these Project components. While the locations of the Bleeder Shaft Facilities are not yet known, the footprint of the East Refuse Disposal Area would have long term impacts to approximately 190 acres of agricultural fields, 147 acres of hay/pasture land, and 40 acres of deciduous forest. The remaining 11 acres is developed land.

Once the Bleeder Shaft Facilities and the East Refuse Disposal Area are constructed, the portions of land that are not covered by hard surfaces (i.e., graveled areas, access roads, buildings) would be seeded with the approved temporary seed mixture to minimize the potential for wind and water erosion. With completion of the operational lives of these Project components, the Bleeder Shaft Facility locations would be restored based on the IDNR-OMM approved post-mining topographic conditions. The East Refuse Disposal Area would be capped with soils and made to adequately drain, as described in Section 2.1.2.3. Following this partial restoration, this area could likely be used as pasture land.

No uncommon terrestrial plant communities or otherwise unusual vegetation have been identified in the Project Area, including where surface disturbances are proposed; thus, no impacts to these vegetative communities are anticipated in association with the Project.

Coal-Extraction Related Effects

Plant communities in the area of planned subsidence may be temporarily impacted by ponded water but would return to IDNR-OMM approved post-mining topographic conditions

following reclamation. Thus, long-term impacts to vegetation in the subsided areas would not occur.

Cumulative Effects

The Proposed Action would not contribute to cumulative adverse impacts to vegetation. Permanent impacts to biological resources associated with Sugar Camp's ongoing and proposed actions associated with the overall 37,972-acre SBR No. 6 mine expansion and the existing 2,420-acre surface effects area would continue to be avoided or mitigated, per the IDNR-OMM permit requirements.

3.4.2 Wildlife

3.4.2.1 Affected Environment

With the exception of those bird species able to either subsist on crops (e.g., American crow, ring-necked pheasant) or to nest among them (e.g., horned lark, killdeer), relatively few bird species are able to use monocultural cropland habitat, which composes approximately 48 percent of the Project Area where disturbances are proposed. Other species that cannot subsist in the agricultural areas are restricted to early successional habitats or forested habitats along the rivers and streams in the Project Area. Many types of reptiles, amphibians, mammals, and birds are found in the forested habitats in this area (IDNR 2002).

The Big and Little Muddy rivers, and some of their tributaries, contain most of the best remaining bottomland forest habitat left in the region. Small, rock-bottomed streams, which course through forested areas, provide habitat for many species of mammals, reptiles, amphibians, and Neotropical migrant and permanent resident birds breeding in the region. There is an abundance of farm ponds, strip mine ponds, and lakes scattered throughout the Big Muddy Watershed, and most are remnants of pre-1980s coal mining operations, prior to current reclamation practices (IDNR 2002). Canada geese, mallards, killdeer and occasionally spotted sandpipers breed around lakes, ponds, and impoundments, especially in old strip-mined areas. Birds nest along these ponds, especially those with gradual shorelines and some emergent vegetation (e.g., cattails) along the edge. Migratory songbirds such as flycatchers, vireos, warblers, tanagers, and orioles frequently nest and forage in riparian woodlands associated with these ponds and lakes. Several species of amphibians and reptiles can be found in small farm ponds.

The Project Area is within the boundaries of the Middle Fork Big Muddy River watershed, which lies within a major avian flight corridor. The Mississippi River is approximately 44 miles to the west-southwest of the Project Area, and the Ohio River is approximately 36 miles to the east of the Project Area. For this reason, the Middle Fork Big Muddy River watershed is optimally situated for major influxes of migrating birds. These migratory birds include geese, ducks, and other water birds that are attracted to flooded fields and large lakes in the area. Migratory birds of conservation concern, as identified by USFWS (USFWS 2008) and likely occurring in the Project Area, include the red-headed woodpecker and loggerhead shrike (present year-round), wood thrush (summer resident), and several spring and fall migrants including the solitary sandpiper, blue-winged warbler, cerulean warbler, and Kentucky warbler.

3.4.2.2 Environmental Consequences

3.4.2.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to wildlife. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be mitigated, per IDNR-OMM permit requirements.

Wildlife present at the time of construction of the bleeder shaft facilities and the East Refuse Disposal Area may relocate to nearby areas of similar habitat for the duration of the Project. Wildlife that prefer forested areas would have sufficient adjacent and nearby lands of this type. Any effects resulting from subsidence or mining would be subject to mitigation under Sugar Camp's integrated fish and wildlife habitat reclamation plan; the impacts to terrestrial wildlife and migratory birds would be insignificant after mitigation.

3.4.2.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining plan. This would result in temporary, localized impacts to wildlife due to surface disturbances and planned subsidence.

Effects to wildlife resulting from mining would be subject to mitigation under Sugar Camp's integrated fish and wildlife habitat reclamation plan; as such, the impacts to terrestrial wildlife would be insignificant after mitigation. Similarly, migratory bird flight patterns and stopovers would not be significantly impacted.

Surface Disturbances

Surface disturbances associated with the Action Alternative would affect to wildlife. Any wildlife present at the time of construction of the Bleeder Shaft Facilities and the East Refuse Disposal Area may relocate to nearby areas of similar habitat for the duration of the Project. These species would likely return with completion of reclamation activities. If the Bleeder Shaft Facilities are constructed in forested areas, wildlife species that utilize forested habitats would be impacted. These effects would be evaluated by TVA once their locations are known.

According the 2016 NLCD, the 525-acre site of the East Refuse Disposal Area contains forested areas that have the potential to be cleared for the Project. This would displace or eliminate wildlife dependent on this forested area. With reclamation, the East Refuse Disposal Area would be capped with soils and seeded with the approved temporary seed mixture to minimize the potential for wind and water erosion. While the area would not immediately support species that prefer deciduous forested areas, wildlife that utilize open grassland and pasture lands would return to these areas following restoration. Wildlife that prefer forested areas would have sufficient adjacent and nearby lands of this type, and over time, these species could eventually return to the site of the East Refuse Disposal Area with potential field succession. Thus, overall, impacts to wildlife habitat associated with the East Refuse Disposal Area would be temporary and negligible to minor.

Coal Extraction-Related Effects

The temporary inundation of some subsided areas would affect wildlife by displacing some upland species such as the eastern meadowlark and providing additional habitat for wildlife

using wetland habitats, including several species of amphibians, reptiles, herons, waterfowl, and shorebirds. These effects would occur short-term, prior to the restoration of the subsided areas to IDNR-OMM-approved post-mining land contours and hydrology.

Cumulative Effects

The Proposed Action would not contribute to cumulative adverse impacts to the biological environment. Permanent impacts to biological resources associated with Sugar Camp's ongoing and proposed actions associated with the overall 37,972-acre SBR No. 6 mine expansion and the existing 2,420-acre surface effects area would continue to be avoided or mitigated, per the IDNR-OMM permit requirements. Wildlife would be temporarily disturbed by surface disturbances, but displaced species would likely return with completion of reclamation activities. Effects to wildlife resulting from mining operations are subject to mitigation under Sugar Camp's integrated fish and wildlife habitat reclamation plan.

3.4.3 Aquatic Life

3.4.3.1 Affected Environment

As described in Sections 3.2.2, seven named streams and multiple unnamed intermittent and ephemeral tributaries and ponds are present in the Project Area (Figures 3-3 and 3-4). All of these water bodies support aquatic life. Four of the named streams are perennial: Middle Fork Big Muddy River, Sugar Camp Creek, Sullivan Branch, and Ewing Creek.

3.4.3.2 Environmental Consequences

3.4.3.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to aquatic life. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR-OMM permit requirements.

Bleeder shaft facilities would be located to avoid Waters of the U.S. to the maximum extent practicable. Construction on the site of the East Refuse Disposal Area would potentially impact 27,806 linear feet of ephemeral and intermittent streams, 1.4 acres of wetlands, and one pond totaling 0.2 acres. These waterbodies likely contain aquatic life. Impacts to streams or other waterbodies in subsidence areas would be subject to Sugar Camp's mitigation plan, and long-term impacts to aquatic life would be minimized.

3.4.3.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining. This would result in insignificant impacts to aquatic life due to surface disturbances and minimal impacts due to planned subsidence in the Shadow Area.

Surface Disturbances

While it is not anticipated that the Bleeder Shaft Facilities would affect waterbodies, the construction and operation of these Project components would be reviewed by TVA for their potential effects on aquatic life.

Construction on the site of the East Refuse Disposal Area would potentially impact 27,806 linear feet of ephemeral and intermittent streams, 1.4 acres of wetlands, and one pond

totaling 0.2 acres. As described in Section 1.5.2, impacts to Waters of the U.S. would be subject to USACE 404 permits and IEPA 401 Water Quality Certifications. Existing streams would be impounded, made to flow through culverts, or filled and, their flows, rerouted around the developed areas. Disturbances to these waterbodies would affect aquatic life.

Coal Extraction-Related Effects

Prior to reclamation, aquatic life could be affected by the alteration of habitat conditions within streams and changes to riparian conditions due to subsidence. These impacts could result in increased erosion and siltation, loss of in-stream habitat, and increased stream temperatures. Siltation has a detrimental effect on many aquatic animals adapted to riverine environments. Turbidity caused by suspended sediment can negatively impact spawning and feeding success of many fish species (Sutherland et al. 2002). Impacts on aquatic life are expected to be temporary, as hydrology and, thus, aquatic habitat would be restored in the subsided areas through reclamation, as discussed in Section 2.1.2.3.

Cumulative Effects

The Proposed Action would not contribute to cumulative adverse impacts to the biological environment. Permanent impacts to biological resources associated with Sugar Camp's ongoing and proposed actions associated with the overall 37,972-acre SBR No. 6 mine expansion and the existing 2,420-acre surface effects area would continue to be avoided or mitigated, per the IDNR-OMM permit requirements. Aquatic life would be temporarily disturbed by surface disturbances and coal extraction-related effects associated with the overall 37,972-acre SBR No. 6 expansion area and in the existing 2,420-acre surface effects area, but displaced species would likely return with completion of reclamation activities. Effects to aquatic life resulting from mining operations are subject to mitigation under Sugar Camp's integrated fish and wildlife habitat reclamation plan.

3.4.4 Threatened and Endangered Species

The Illinois Threatened and Endangered Species by County list (IDNR 2018) was reviewed to determine the threatened and endangered species known to occur in the counties of the Project Area. Collectively, Franklin and Hamilton counties contain three federally listed and nine state-listed threatened and endangered species, including four plants, one fish, two reptiles, three birds, and two mammals (Table 3-5). Aerial photographs, soil data, and land cover within the Project Area were compared to known habitat preferences for listed species. The information in the various SBRs and IBRs associated with UCM Permit No. 382, as described in Section 1.3, has been subject to consultation and review by IDNR-OMM, IDNR Office of Realty and Environmental Planning, and USFWS (USFWS 2017; Appendix B). Limited suitable habitat is present in the Project Area for most listed species.

3.4.4.1 Federally Listed Species

3.4.4.1.1 Affected Environment

Federally listed species determined during database research as having the potential to utilize the Project Area are shown in Table 3-5. These species consist of one bird and two mammals. Designated critical habitat for these species does not occur in the Project Area.

Table 3-5. Federally listed species potentially occurring in the Project Area

Common Name	Scientific Name	Status	Preferred Habitat	Potential Habitat on Project Site
Birds				
Piping Plover	*Chardrius melodus*	E	Piping plover populations use wide, flat, open sandy beaches. In Illinois, mudflats associated with lakes, ponds, or impoundments may be used for stopover habitat during migration.	No
Mammals				
Indiana Bat	*Myotis sodalis*	E	Indiana bats spend winter hibernating in caves and mines. Summer habitat consists of the presence of suitable (i.e., open enough for bats to access) drinking and foraging areas with Potential Roost Trees (PRTs). A PRT has exfoliating bark, cracks, crevices or cavities that are greater than 5-inch diameter at breast height (DBH).	Yes
Northern Long-Eared Bat	*Myotis septrentrionalis*	T	Northern long-eared bats spend winter hibernating in caves and mines. Summer bat habitat consists of the presence of suitable (i.e., open enough for bats to access) drinking and foraging areas with PRTs. A PRT has exfoliating bark, cracks, crevices or cavities that are greater than 3-inch DBH.	Yes

The piping plover is a small shorebird. Three geographically distinct summer breeding locations are recognized in the U.S. These consist of the Great Plains states, the shores of the Great Lakes, and the shores of the Atlantic Coast. Birds from all three populations winter on the southern Atlantic and Gulf coasts in the U.S. (USFWS 2017). Piping plovers use wide, flat, open, sandy beaches with very little grass or other vegetation. Nesting territories often include small creeks or wetlands. In Illinois, mudflats associated with lakes, ponds, impoundments, rivers and larger streams, and wetlands may provide potentially suitable stopover habitat for this species during migration (IDNR 2002). A loss of habitat along beaches and other areas has led to the listing as threatened. While traditional coastal habitat associated with the piping plover is not present in the Project vicinity, the piping plover may stop in the region during migration and is therefore identified within this section. However, no stopover habitat is present in or adjacent to the Project Area.

Indiana bats hibernate in caves and abandoned mines during winter. During summer, this species roosts under loose tree bark, as well as in cracks and crevices, and forages in and along the canopy of riparian and upland forests. The bats generally travel less than three miles from their roost to forage, and foraging area size varies greatly from 15 acres to over 7,000 acres (Sparks et al. 2004). The Indiana bat is a long-lived species (up to 20 years)

and is believed to return to the same roost tree area, travel corridors, and foraging sites year after year (Sparks et al. 2004).

Female Indiana bats roost together in maternal colonies during the summer to rear their young. These colonies are found in forested areas. Suitable summer habitat (such as upland and bottomland forests and woods near streams) for the Indiana bat occurs within the Project Area. Indiana bats have suffered population losses in recent years because of tree loss, pesticides, human disturbance, the collapse or flooding of cave hibernation sites, and a disease known as “white nose syndrome” that compromises bat immune systems (USFWS 2019b).

Mist net surveys conducted between 2010 and 2014 and in 2017 at Sugar Camp Mine No. 1 captured Indiana bats within the surface effects area and adjacent to and in the vicinity of the Project Area (Alliance Consulting 2015, 2017a, 2017b, 2017c, 2017d). These captures were expected due to Sugar Camp Mine No. 1 being approximately 2.5 miles of known maternity roost habitat and the presence of bat boxes installed in the surface effects area as mitigation measures. Mist net surveys at the location of the East Refuse Disposal Area conducted in 2019 resulted in no capture of Indiana bats (Alliance Consulting 2019b; Appendix B). According to USFWS, the Shadow Area is not within designated critical habitat for this bat (USFWS 2017).

Northern long-eared bat summer roosting and maternity habitat consists primarily of live or dead tree species and/or snags greater than or equal to three inches DBH that have exfoliating bark, cracks, crevices, and/or hollows; although, they also use bat-houses, buildings, and other anthropogenic structures (Amelon and Burhans 2006). Winter roosting and maternity habitat typically consists of large caves and/or mines with large passages and entrances, constant temperatures, and high humidity with no air currents (USFWS 2015).

Prior to 2015, surveys conducted by Alliance Consulting for Sugar Camp captured northern long-eared bats at five sites in Franklin County. One site is located at the edge of the surface effects area, and three sites are located less than one mile from the surface effects area. The fifth site is 10 miles southwest of the Project Area. Mist net surveys conducted adjacent to and in the vicinity of the Project Area in 2017 and at the location of the East Refuse Disposal Area and 2019 did not result in any captures of northern long-eared bats (Alliance Consulting 2015, 2017a, 2017b, 2017c, 2017d, 2019b; Appendix B). The Shadow Area is located outside of designated critical habitat for this bat, per USFWS (2017).

3.4.4.1.2 Environmental Consequences

3.4.4.1.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to federally-listed species. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR-OMM permit requirements.

The No Action Alternative is unlikely to affect federally listed species. Coordination with USFWS and IDNR is ongoing for surface disturbances. Habitat disturbances resulting from coal extraction or planned subsidence would be mitigated under Sugar Camp’s integrated fish and wildlife habitat reclamation plan. In their correspondence with IDNR regarding the UCM Permit No. 382 application, USFWS determined that the subsidence and associated reclamation activities would have no effect on federally listed bats (Appendix B).

3.4.4.1.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining. As described below, overall, the Action Alternative is unlikely to affect federally listed species. Any habitat disturbances resulting from the mining or planned subsidence would be subject to restoration under Sugar Camp's integrated fish and wildlife habitat reclamation plan, per IDNR permit requirements.

Surface Disturbances

Prior to the construction of the Bleeder Shaft Facilities, TVA would conduct additional reviews to determine the effects of the construction and operation of these facilities on federally listed bat species. If required by USFWS, Sugar Camp may need to conduct additional presence/absence survey to determine the potential effects of the construction and operations of the Bleeder Shaft Facilities on federally listed bats or assume bat presence and/or limit any necessary tree clearing to between October 15 and March 31 to avoid impacts to federally listed bats.

Mist net surveys conducted in 2019 at the location of the East Refuse Disposal Area did not capture any Indiana bats or northern long-eared bats (Alliance Consulting 2019b; Appendix B). Coordination with USFWS on the effects of the construction and operation of the East Refuse Disposal Area is ongoing.

Coal Extraction-Related Effects

In their correspondence with IDNR regarding the SBR No. 6 application, USFWS determined that the subsidence and associated reclamation activities would not be likely to adversely affect any federally listed species (USFWS 2017; Appendix B).

Cumulative Effects

The Proposed Action would not contribute to cumulative adverse impacts to federally listed species. Ongoing coordination with USFWS on the effects of proposed mine operations and components associated with the overall 37,972-acre SBR No. 6 mine expansion and the existing 2,420-acre surface effects area would determine the effects of the proposed mine operations and components and avoidance and minimization measures would be taken, accordingly and in compliance with the Endangered Species Act. Effects to wildlife, including federally listed wildlife species, resulting from mining operations are subject to mitigation under Sugar Camp's integrated fish and wildlife habitat reclamation plan.

3.4.4.2 State-Listed Species

3.4.4.2.1 Affected Environment

Database research indicated that nine state-listed species may occur in the area. These species are presented in Table 3-5.

Table 3-6. State-listed species potentially occurring in the Project Area

Common Name	Scientific Name	Preferred Habitat	Potential Habitat in Project Area
Barn owl	*Tyto alba*	Inhabits open areas, including agricultural fields, grasslands, and marshes	Yes
False Bugbane	*Cimicifuga racemosa*	Habitat includes mesic deciduous forests.	Yes
Green Trillium	*Trillium viride*	Rich woodlands and deciduous forests	No
Little Blue Heron	*Egretta caerulea*	Inhabits freshwater swamps, lagoons, coastal thickets and islands.	No
Ornate Box Turtle	*Terrapene ornata*	Habitat includes prairies and open fields in former prairies.	No
River Cooter	*Pseudemys concinna*	Found in backwaters and oxbow lakes of large rivers and reservoirs.	No
River Redhorse	*Moxostoma carinatum*	Inhabits deep, swift, gravel riffles of small and medium-sized rivers and is tolerant of silty bottoms, turbid water, and intermittent flow.	No
Spotted Pondweed	*Potamogeton pulcher*	Found in shallow water, emergent marshes, and on muddy shores.	No
Storax	*Styrax americana*	Found in very poorly drained habitats associated with other wetland species.	Yes

Little blue herons range from New England south to Florida along the Gulf Coast and north to Illinois. The little blue heron winters on the Gulf and the Atlantic Coasts north to New Jersey and also can be found in the tropics. This animal makes its home in freshwater swamps, lagoons, coastal thickets and islands, where its diet consists of fish, crustaceans, amphibians, insects, and reptiles (Rodgers and Smith 2012). In relationship to the Project Area, the closest known observation was in 1998, approximately three miles northwest of the northern portion of the Project Area at Rend Lake in Franklin County. The types of wetlands it inhabits are absent from the surface effects area and most of the Project Area.

Barn owls inhabit open areas, including agricultural fields, grasslands and marshes. Their diet is dominated by voles and other small mammals (WDNR 2017). Barn owls nest and roost in a variety of places including hollows or natural cavities in trees, man-made structures, caves, and cliffs. Barn owls are capable of producing multiple broods in a nesting season. The peak of the initial nesting attempts occurs from March to May in the Midwest (IDNR 2010).

The barn owl is widespread, occurring throughout most tropical and subtropical regions of Central and South America, and extending into temperate regions in North America and Europe (WDNR 2017). Populations are stable in some parts of their range, but seven Midwestern states, including Illinois, list barn owls as threatened or endangered. The most often-cited cause of these declines has been the loss of nesting, roosting, and foraging

sites resulting from changing agricultural practices and urbanization (WDNR 2017). As agriculture has increased in scale and modern farming techniques have been implemented, many farm buildings have disappeared from the landscape, rows of trees have been removed, and production has shifted from cover crops such as oats and hay to row crops like corn.

The barn owl was recently documented at four sites in Franklin County and seven sites in Hamilton County. The Franklin County sites are located 14 miles west of the northern portion of the Project Area, five and eight miles southwest of the southern portion of the Project Area, and four miles south of the Project Area, while the Hamilton County sites range from four to 17 miles east and seven to nine miles north of the Project Area. Suitable habitat is present in the Project Area.

The ornate box turtle can be found from South Dakota to Arizona east to the Mississippi Valley. Habitat includes prairies and open fields in former prairies (INHS 2018). The species was recorded at one site in Franklin County at Wayne Fitzgerrell State Park, five miles northwest of the northern portion of the Project Area.

False bugbane, also known as black cohosh, is a flowering plant of the buttercup family. The species prefers mesic deciduous forested areas. The plant has a single identified location in Franklin County, 14 miles southwest of the surface effects area. Habitat may be present within the forested areas of the Project Area.

Green trillium prefers rich woodlands and prairie habitat. The species is known from a single occurrence in Franklin County, located 14 miles west and southwest of the Project Area. Given the distance to known occurrences and the lack of suitable habitat, this species is not likely to occur in the Project Area.

Spotted pondweed is an aquatic plant distinguished by its black-spotted petioles and stems that can be found in shallow water, emergent marshes, and on muddy shores. The species is known from a single location in southwestern Franklin County, located 18 miles southwest of the northern portion of the Project Area. Spotted pondweed could occur but is not likely to occur in the Project Area. Potential habitat for this species exists along Sugar Camp Creek in the northern portion and along Ewing Creek in the northern portion of the Shadow Area.

Storax is a deciduous shrub and obligate wetland species found in floodplain forests, oxbow lakes, and deep swamps in southern Illinois (Mohlenbrock et al. 1961). Storax is found in very poorly drained habitats often in association with other wetland species including bald cypress water tupelo, water hickory, Virginia willow, and southern buckthorn (Mohlenbrock et al. 1961). Storax is known to occur at one site in Hamilton County, 12 miles northeast of the northern portion of the Project Area at a unit of Ten Mile Creek SFWA. Storax is common in deep swamp habitats with stable, regular hydrology, such as seasonally flooded or semi-permanently flooded habitats. This habitat association, as well as the range of storax, is at its northernmost extent in southern Illinois. NWI-mapped freshwater forested/shrub wetlands are present within the Project Area along Granny Creek, Sugar Camp Creek, Carlton Branch, Sullivan Branch, Campbell Branch, and Ewing Creek. Thus, storax has the potential to occur in the Project Area.

The river redhorse is a fish which occurs in the St. Lawrence-Great Lakes and Mississippi River basins. The species inhabits deep, swift, gravely riffles of small and medium-sized

rivers and is intolerant of silty bottoms, turbid water, and intermittent flow. The species is known to occur 16 miles southwest from the surface effects area. Given this distance from a known occurrence and lack of suitable habitat within the Project Area, the species is unlikely to occur on or adjacent to the Project Area.

The river cooter is a turtle found in the east from Virginia to northern Florida west to Oklahoma and Kansas, and north to southern Illinois and Indiana. The river cooter is found in backwaters and oxbow lakes of large rivers and reservoirs (INHS 2014). In Gallatin County, the river cooter is known to occur in several oxbow wetlands and large streams immediately adjacent to the Ohio River (INHS 2014). The river cooter is known to occur in the Big Muddy River drainage in the Rend Lake area, upstream of the confluence with the Middle Fork, in Franklin County. The Big Muddy population is eight miles from the surface effects area but in a different watershed.

3.4.4.2.2 Environmental Consequences

3.4.4.2.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to state-listed species. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR-OMM permit requirements.

Temporary impacts to state-listed threatened and endangered species may occur as a result of surface disturbances. Prior to the construction of the bleeder shaft facilities and the East Refuse Disposal Area, Sugar Camp would coordinate with IDNR to determine whether impacts to state-listed species are expected to occur. Any habitat disturbances resulting from the mining operations would be mitigated under Sugar Camp's integrated fish and wildlife habitat reclamation plan, per IDNR-OMM permit requirements. Thus, any impacts to state-listed species would be temporary.

3.4.4.2.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining plan. Temporary impacts to state-listed threatened and endangered species may occur due to surface disturbances. These impacts and any temporary impacts associated with subsidence would be mitigated under Sugar Camp's integrated fish and wildlife habitat reclamation plan.

Surface Disturbances

Prior to the construction of the Bleeder Shaft Facilities, TVA would conduct reviews to determine whether impacts to state-listed species are expected to occur.

Construction and operation of the East Refuse Disposal Area may result in impacts to the state-listed barn owl and false bugbane. The barn owl inhabits agricultural fields and grasslands, of which approximately 337 acres occur in the proposed footprint of the East Refuse Disposal Area. False bugbane prefers mesic deciduous forested areas. Deciduous forest would be impacted by construction of the East Refuse Disposal Area. Impacts to these state-listed species would be minor given the amount of similar habitat areas in the vicinity of the Project Area. No impacts to storax would result from construction and operations of the East Refuse Disposal Area because no wetlands would be impacted.

Any habitat disturbances resulting from the mining operations would be mitigated under Sugar Camp's integrated fish and wildlife habitat reclamation plan, per IDNR-OMM permit requirements. Thus, any impacts to state-listed species would be temporary and insignificant.

Coal Extraction-Related Effects

Due to the minimal disturbance from subsidence, the temporary nature of subsidence effects, and the limited existing habitat, no significant impacts to state-listed species are expected. Any effects resulting from mining and associated subsidence would be temporary and mitigated under Sugar Camp's integrated fish and wildlife habitat reclamation plan, per IDNR-OMM permit requirements.

Cumulative Effects

The Proposed Action would not contribute to cumulative adverse impacts to federally listed species. Temporary impacts to state-listed threatened and endangered species as a result of Sugar Camp's ongoing and proposed actions associated with the overall 37,972-acre SBR No. 6 mine expansion and the existing 2,420-acre surface effects area may occur. However, effects to wildlife, including listed species, resulting from mining operations are subject to mitigation under Sugar Camp's integrated fish and wildlife habitat reclamation plan, per IDNR permit requirements.

3.5 Natural Areas

This section addresses natural areas that are within 10 miles of the Project Area. Under the Illinois Natural Areas Preservation Act, a natural area is defined as "an area of land in public or private ownership which, in the opinion of the Commission, either retains or has recovered to a substantial degree its original natural or primeval character, though it need not be completely undisturbed, or has floral, faunal, ecological, geological, or archaeological features of scientific, educational, scenic or esthetic interest," (Illinois General Assembly 2020). Water resources were identified using data obtained from IDNR.

3.5.1 Affected Environment

The Project Area is within the Middle Fork Big Muddy River Resource Rich Area (RRA) which includes portions of Franklin, Hamilton, and Jefferson counties. This RRA is recognized by the IDNR for its natural areas, including large tracts of forest, a 22-acre portion of the Ten Mile Creek State Fish and Wildlife Area (SFWA), a 388-acre bottomland/swamp forest known as the Freeman Coal Company Forest Natural Area (NA), and several other smaller bottomland forest/swamps. Portions of the Ten Mile Creek SFWA are within three miles of the Project Area (Figure 3-11). This 5,820-acre area managed by IDNR is divided into four management units. Several of these units, which are utilized for hunting and wildlife management, are reclaimed mining sites. The privately owned and managed Freeman Coal Company Forest NA is located in Franklin County, approximately 9.5 miles southwest of the southern portion of the Project Area.

Wayne Fitzgerrell State Park is located in Jefferson and Franklin Counties, approximately 3.8 miles northwest of the northern portion of the Project Area. This 3,300-acre area at Rend Lake is owned by USACE and managed by IDNR. The site is utilized for hunting, fishing, camping, picnicking, horseback riding, hiking, and water sports. Additional natural areas within ten miles of the Project Area include Mt. Vernon Game Propagation Center and Rend Lake SFWA.

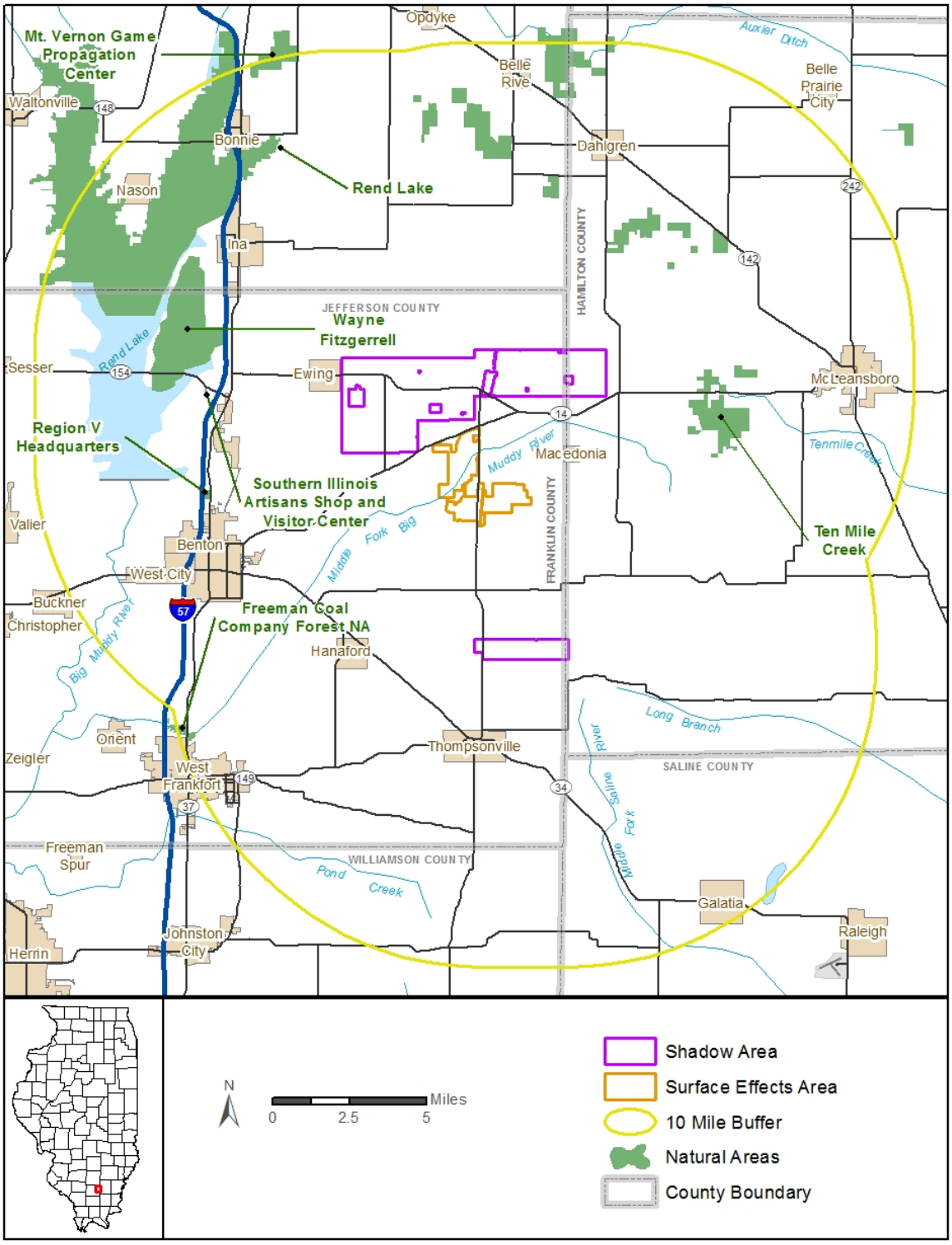


Figure 3-11. Natural Areas within 10 Miles of the Project Area

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to natural areas.

Sugar Camp's actions related to ongoing mining of previously approved TVA-owned coal and privately owned coal would not result in direct adverse impacts to the Middle Fork Big Muddy River RRA or other natural areas in the vicinity. Planned subsidence of approximately 22,484 acres could cause indirect effects to natural areas in the vicinity of the SBR No. 6 mining activities due to temporary effects to hydrologic patterns, but with restoration, permanent impacts to these natural areas would not result.

3.5.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining plan. This may result in indirect impacts to natural areas due to planned subsidence in the Shadow Area. No impacts to natural areas would occur due to surface disturbances or coal extraction.

Planned Subsidence

The Middle Fork of the Big Muddy River RRA surrounds the Project Area. The Ten Mile Creek SFWA is located within three miles of the Project Area. The Rend Lake SFWA is within four miles of the Project Area. Ten Mile Creek SFWA and Rend Lake SFWA are either upstream from the Project Area or within a different stream drainage; therefore, no hydrologic impacts to the SFWAs are anticipated due to planned subsidence.

Potential indirect impacts to the Middle Fork of the Big Muddy River RRA and Freeman Coal Company Forest NA from subsidence could cause changes in stream and drainage patterns; these impacts could indirectly affect wetland functions of the bottomland and floodplain forests. As future mining activities within the Project Area would require the restoration of altered streams and drainage patterns to approximate pre-mining conditions, permanent impacts to hydrologic functions that support the RRA and NA would be avoided or minimized. As there are existing streams and tributaries not affected by subsidence that support the hydrologic functions of the RRA and NA, no further impacts to the Middle Fork of the Big Muddy River RRA and the Ten Mile Creek SFWA are anticipated.

Cumulative Effects

The Proposed Action would not contribute to direct cumulative adverse impacts to the Middle Fork Big Muddy River RRA or other natural areas in the vicinity, as no direct impacts associated with Sugar Camp's ongoing and proposed actions are anticipated. Minor, temporary indirect impacts could occur as a result of subsidence of 33,033 acres associated with the overall 37,972-acre SBR No. 6 expansion area and temporary effects to hydrologic patterns. These temporary impacts would be subject to post-subsidence reclamation activities.

3.6 Land Use

This section addresses land uses within the Project Area and how they would be affected by the alternative actions.

3.6.1 Affected Environment

The National Land Cover Database was used to identify existing land uses within the portions of the Project Area where new Project elements are proposed (Table 3-7; Figures 3-12, 3-13). Both the East Refuse Disposal Area location and the Shadow Area are dominated by agricultural land uses in hay/pasture and cultivated crops. Areas of deciduous forest are concentrated around streams within the Project Area, including Middle Fork Big Muddy River, Sugar Camp Creek and their tributaries. Additional land uses in the Project Area include small areas of developed land in residential and industrial/commercial land uses.

Because the exact locations of the Bleeder Shaft Facilities are not known, if is not possible to quantify the current land uses of their sites. However, due to existing patterns of land use in the Shadow Area, they would most likely be sited on agricultural land and would occupy a total of about 5.3 acres in five separate locations.

The City of Benton, Illinois, and Rend Lake are located a few miles west of the Project Area. Current land use within much of the surface effects area is heavy industrial and includes operation of existing facilities for the processing, storage and transport of coal on an approximately 2,420-acre area in Franklin County. Existing facilities include the north refuse disposal area, the Coal Preparation Plant, and the south refuse disposal area (Figure 1-2). The site of the East Refuse Disposal Area is comprised of about 453 acres of cultivated cropland and hay/pasture, 54 acres of deciduous forest, 13 acres of developed open space (primarily roads), and smaller areas of other land uses. The East Refuse Disposal Area is within an unincorporated portion of Franklin County that is not currently zoned.

Table 3-7. Land Cover within Project Area

	East Refuse Disposal Area		Shadow Area	
	Acres	%	Acres	%
Open Water	0.0	0.0%	10.9	0.1%
Developed, Open Space	13.4	2.5%	431.8	3.6%
Developed, Low Intensity	3.4	0.6%	106.9	0.9%
Developed, Medium Intensity	0.0	0.0%	8.2	0.1%
Developed, High Intensity	<0.1	0.0%	1.1	0.0%
Deciduous Forest	54.2	10.3%	2,045.1	16.8%
Herbaceous	1.5	0.3%	137.2	1.1%
Hay/Pasture	187.3	35.6%	3,598.1	29.6%
Cultivated Crops	265.7	50.6%	5,803.1	47.8%
Woody Wetlands	0.0	0.0%	2.8	0.0%

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to land use. Impacts from the ongoing mining of previously approved TVA-owned coal and privately

owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR-OMM permit requirements.

Forested and agricultural land would be converted to heavy industrial uses by the construction and operation of the bleeder shaft facilities and the East Refuse Disposal Area. Permanent land use impacts would be minor, as reclamation would occur and cultivated crops are prevalent in Franklin County and throughout the state. Temporary, minor impacts on land use could occur as a result of subsidence, but Sugar Camp is responsible for mitigation measures to restore the permit areas to IDNR-OMM-approved post-mining land uses.

3.6.2.2 Action Alternative

Surface Disturbances

Forested and agricultural land would temporarily be converted to heavy industrial uses by the construction and operation of the five Bleeder Shaft Facilities and the East Refuse Disposal Area.

As described in Section 2.1.2.3, upon conclusion of mining of each longwall panel, as the use-life of Project components come to an end, and/or at the completion of the active mining operations, reclamation operations would commence. Reclamation activities would be completed by Sugar Camp in accordance with the approved reclamation plan and the permit conditions developed in accordance with Chapter I, Illinois Administrative Code (IAC) 1817.62. Sugar Camp estimates that the full reclamation of Sugar Camp Mine No. 1 would begin in 2040.

All rough grading will be completed within 180 days following the removal of facilities, except the East Refuse Disposal Area (the reclamation for which is described below). Final grading and reclamation of topsoil and temporary cover crops completed within 12 months after closure of the active mining operation. The approved species of cover crops would be seeded to provide vegetative cover in accordance with IDNR-OMM-approved post-mining land use. Erosion and sediment control would be used to further stabilize the reclaimed Project Area.

If built, the East Refuse Disposal Area would not be fully reclaimed to existing conditions; instead, this disposal area would be filled to capacity, capped with soils, and made to adequately drain, as described in Section 2.1.2.3. Due to the lack of full reclamation, permanent effects to land use within the East Refuse Disposal Area site are anticipated because of the land could no longer be used for cultivated crops. However, this area could likely be used as pasture land following partial restoration. Overall, the Project would have minor effects on land use as cultivated crops are prevalent in Franklin County and the state.

Coal Extraction-Related Effects

Temporary, minor impacts to land use would occur as a result of subsidence. Examples of potential damage caused by subsidence include cracks in building foundations, road surfaces, or ponding of water from subsided streams, which would have localized, temporary, and minor impact impacts to land use within the Project Area. Subsidence does not normally directly affect the inherent productivity of the surface for typical land uses such as agriculture or forestry. Longwall mining results in predictable and uniform subsidence patterns. IDNR-OMM requires coal companies to reestablish drainage patterns and stream

profiles affected by mining activities. Sugar Camp is required to compensate landowners for any temporary crop loss from impaired drainage and any permanent crop loss due to the alteration or installation of waterways. Measures that Sugar Camp would implement to mitigate the effects of subsidence are further described in Section 2.1.2.3. These measures are designed to ensure the land is returned to a condition capable of maintaining the value and reasonably foreseeable uses that the land was capable of supporting prior to subsidence. Consequently, no long-term impacts to land use are expected as a result of the underground extraction of coal.

Cumulative Effects

The Proposed Action would contribute to cumulative effects to land use in limited areas. Overall, permanent, cumulative changes to land use resulting from changes to agricultural uses from existing and proposed refuse disposal areas in the existing 2,420-acre surface effects area would have a minor effect, as cultivated crops are prevalent in Franklin County and throughout the state. Cumulatively, minor temporary impacts to land use could occur in the 33,033-acre subsidence area associated with the overall 37,972-acre SBR No. 6 expansion area. However, these would be mitigated by reestablishment of drainage patterns or compensation to farmers.

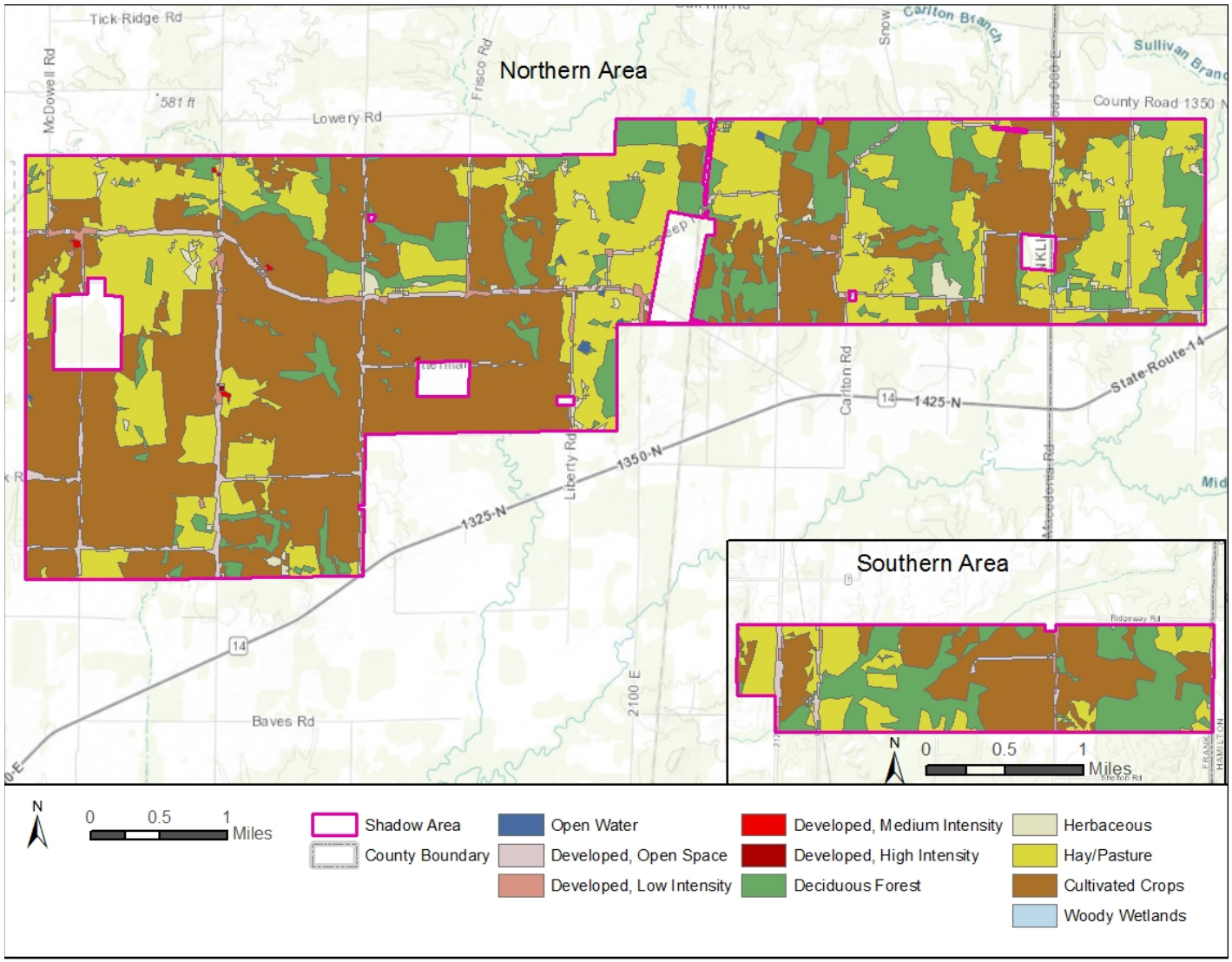


Figure 3-12. Land Use within the Shadow Area

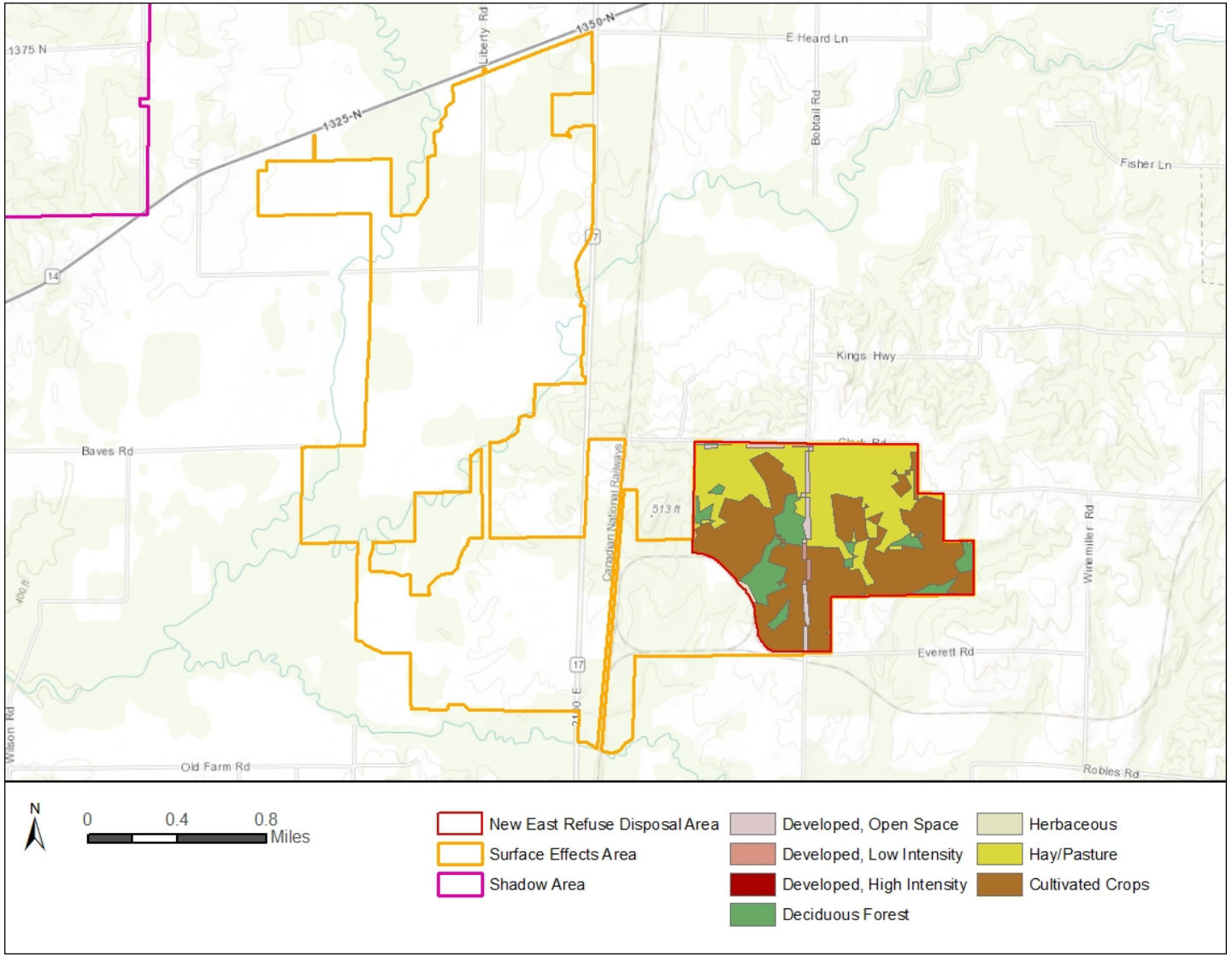


Figure 3-13. Land Use within the New East Refuse Disposal Area

3.7 Transportation

This section describes the potentially affected environment for the public roadways and railroads within the Project Area. The public roads and railroads were identified using county GIS data for Hamilton and Franklin counties.

3.7.1 Affected Environment

There are approximately 52 miles of local roads and three miles of railroad within the Project Area. Approximately four miles of these local roads are located within the surface effects area; all other roads are located in the Shadow Area. A complete listing of roads within the Project Area is included below in Table 3-8.

Table 3-8. Roads and Railroads within the Project Area

County	Road Name	Miles in Shadow Area	Miles in Surface Effects Area
Franklin	Accommodation Rd	1.45	
Franklin	Bobtail Rd	0.85	
Franklin	Browning Ln	0.03	
Franklin	Camp Hope Rd	3.03	
Franklin	Carlton Rd	0.23	
Franklin	Clark Rd	0	0.24
Franklin	Co Hwy 12	4.68	
Franklin	Co Hwy 17	0.21	0.78
Franklin	Co Hwy 2	3.08	
Franklin	Co Hwy 7	0.69	
Hamilton	Co Rd 000 E	0.16	
Franklin	Co Rd 000 E	0.16	
Hamilton	Co Rd 100 E	0.10	
Hamilton	Co Rd 1200 N	1.12	
Hamilton	Co Rd 1250 N	0.16	
Hamilton	Co Rd 1250N Farm Access Rd	0.16	
Franklin	Co Rd 1525 N	0.18	
Franklin	Co Rd 1675 E	0.56	
Franklin	Co Rd 2050E	0.98	1.18
Hamilton	Co Rd 50 E	1.38	
Franklin	Dial Rd	0.35	
Franklin	E Accommodation Rd	0.29	
Franklin	E Frank Rd	0.40	
Franklin	E Sheep Farm Rd	0.23	
Hamilton	Evan Dale Ln	1.12	
Franklin	Ewing Rd	4.77	
Franklin	Frisco Rd	1.00	
Franklin	Happy Row Rd	0.03	
Franklin	Hen Ln	0	0.24

County	Road Name	Miles in Shadow Area	Miles in Surface Effects Area
Franklin	Hoover Rd	0.69	
Franklin	Kearney Rd	0.55	
Franklin	Ketterman Ln	0.39	
Franklin	Liberty Rd	0.98	0.05
Franklin	Log Cabin Rd	0.58	
Franklin	Long Prairie Rd	1.99	
Hamilton	Macedonia Rd	1.28	
Franklin	Macedonia Rd	1.28	
Franklin	McDowell Rd	0.56	
Franklin	Meadows Ln	0.19	
Franklin	N Accommodation Rd	0.48	
Franklin	N Bobtail Rd	0.24	0.94
Franklin	N Thompsonville Rd	0.89	0.78
Franklin	Page Rd	0.24	
Franklin	Phillips Cemetery Rd	1.40	
Hamilton	Pr Dr Off 500 E	0.16	
Franklin	Richardson Rd	0.47	
Franklin	Sheep Farm Rd	1.13	
Franklin	Snow Flake Rd	1.45	
Franklin	Snowflake Rd	1.45	
Franklin	State Rte 14	0.03	
Hamilton	Unnamed Road	0.20	
Franklin	Unnamed Road	1.00	0.10
Franklin	Webb Hill Rd	2.50	
Franklin	Canadian National Railway	2.95	

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to transportation. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR permit requirements.

The construction of bleeder shaft facilities and the East Refuse Disposal Area would add a minimal amount of traffic to the roads in the vicinity of private and TVA-approved SBR No. 6 mining activities. Construction and operation of the East Refuse Disposal Area would result in temporary or permanent closure of a portion of North Bobtail Road, which extends north-south across the proposed footprint of the East Refuse Disposal Area. Subsidence has the potential to impact roads and bridges; damage to roads and bridges would be repaired as governed by the permit.

3.7.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining plan. As required by the IDNR permitting process, measures to minimize inconvenience to the users of public roadways and necessary waivers from the authority governing the use of those roads would be obtained by Sugar Camp. Any temporary damage to roads would be repaired as governed by the permit. Temporary or permanent closure of a portion of North Bobtail Road would occur with construction of the East Refuse Disposal Area; however, this is a minor rural among agricultural fields. Thus, if the Project results in a permanent closure, this would have a minor overall effect to transportation in the Project Area.

Surface Disturbances

Coal would be transported via conveyor belt from the mining areas to the existing Coal Preparation Plant in the surface effects area. Thus, these activities would not result in impacts to roads in the Project Area. The processed coal would be loaded onto rail cars at the existing rail loadout and transported from the site via the Canadian National Railway. The capacity of Canadian National Railway coal rail cars can range from 98 to 121 tons per coal rail car. The shipment of 7.1 million tons of processed TVA-owned coal per year by rail would require the addition of approximately 58,678 to 72,449 coal rail cars each year. Implementation of the Project would result in coal shipments via rail over a longer period of time.

The construction of the Bleeder Shaft Facilities and the East Refuse Disposal Area would add a minimal amount of traffic to the roads in the Project Area for the approximate nine-month and two-year construction periods, respectively. This traffic would consist of individual employee vehicles for approximately 35 people and trucks transporting rocks and other supplies to construct these facilities. Construction and operation of the East Refuse Disposal Area would result in temporary or permanent closure of a portion of North Bobtail Road, which extends north-south across the proposed footprint of the East Refuse Disposal Area.

Coal Extraction-Related Effects

No increase in traffic would occur during the operation of the Project-related mining activities due to capacity limitations such that there would not be an increase in employee traffic. Temporary impacts to roads would occur due to planned subsidence in the Shadow Area. Approximately 37 miles of roads within the Project Area could be affected by subsidence, with approximately 32 miles of these roads within Franklin County and 5 miles, within Hamilton County. Increases in traffic associated with routine air quality testing of the Bleeder Shaft Facilities and inspection of the East Refuse Disposal Area are not expected to have a significant impact. As required by IDNR, measures to minimize inconvenience to users of public roadways would be taken such as routing around the planned subsidence areas. No permanent road closures are expected to occur in relation to subsidence.

Prior to mining under roads subject to subsidence, Sugar Camp would obtain the necessary waivers from the public authority governing those roads. Sugar Camp would monitor each roadway section as the longwall panel mining passes underneath it and implement temporary corrective measures, such as rerouting, minor re-grading, repairing pavement, to maintain safe roadways. Once the entire subsidence event passes, Sugar Camp would restore any damage to roads caused by subsidence, per IDNR-OMM requirements.

Depending on the particular road segment, this could include reguarding, repaving, reconstruction of culverts and drainage ditches, and other measures.

Any bridges along roads within the coal extraction areas are considered to be structures, which would be evaluated by a structure survey before the underlying area is mined. Coordination with the appropriate public road authority would be necessary to remove and replace the affected bridge, or if it is along a state route, the state (IDOT) would replace the bridge.

Hecras modeling would be completed in advance of critical areas located in or near the existing 100-year floodplain in relation to the mining sequence to direct pre-mitigation work to prevent or minimize the effects of planned subsidence. Less than 10 depressional areas requiring drainage correction are expected adjacent to roadways.

Planned subsidence may have an effect on the Canadian National Railway, which passes through the northern Shadow Area, the surface effects area, and the southern Shadow Area. Sugar Camp, in close coordination with the Canadian National Railway, would monitor the railway section as the longwall panel passes underneath it and implement temporary corrective measures w to maintain a safe railway. Once the entire subsidence event passes, Sugar Camp, in close coordination with the Canadian National Railway, would restore any damage to the railway caused by subsidence, per IDNR-OMM requirements.

Overall, direct impacts to transportation resources associated with implementation of the Action Alternative would be anticipated to be minor to moderate and minimized or mitigated. The Action Alternative would result in minor indirect impacts to transportation in regards to the added quantities of coal that would be shipped.

Cumulative Effects

If mine components are constructed in the private/TVA-approved shadow area at the same time as those constructed for the Proposed Action or if subsidence of different portions of the overall 37,972-acre SBR No. 6 expansion area occur simultaneously, minor, temporary cumulative effects to existing roadways could occur. Some local road closures could also occur due to the SBR No. 6 mine expansion and ongoing and proposed actions in the existing 2,420-acre surface effects area, resulting in minor, temporary or permanent cumulative effects. As required by the IDNR-OMM permitting process, Sugar Camp would continue to take measures to minimize inconvenience to the users of public roadways and obtain the necessary waivers from the authorities governing the use of those roads.

3.8 Utilities

This section describes the potentially affected environment for township, city and county utilities. Telephone, water, and electric utility lines were identified using public GIS data. Sugar Camp receives power from South Eastern Electric Power Coop and drinking water from Akin Water District.

3.8.1 Affected Environment

There are gas, oil, electric, water, and communications utilities within the Project Area. The providers of these utilities include:

- Central Illinois Public Service Company

- Akin Water District
- Hamilton County Rural Water
- Hill City Water District
- Macedonia Water System
- Ewing-Ina Water Commission
- Hamilton County Telephone Electric Cooperative Association

As shown on Figures 3-14 and 3-15, within the Shadow Area, approximately 20 segments of communications lines, 14 segments of public water lines, one segment of a gas line, and a portion of an electrical line are present. Within the surface effects area, two segments of water lines and one segment of communications line are present.

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to utilities. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized mitigated, per IDNR-OMM permit requirements.

A public water line segment within the footprint of the East Refuse Disposal Area would likely need to be relocated in order to maintain access to the line for routine maintenance and inspection. Relocation of the water line would be done in close coordination with the associated utility company. Minor impacts to utilities would occur as a result of subsidence. Sugar Camp would use existing agreements or pursue new agreements with governmental bodies and utility companies responsible for all utility services expected to be affected by subsidence. Sugar Camp would also be required to compensate utilities for repair of any damage caused by its mining activities.

3.8.2.2 Action Alternative

Under the Action Alternative, TVA would approve proposed mining plan. Permanent impacts would occur to an existing water line segment in the footprint of the East Refuse Disposal Area, but these impacts would be mitigated through its relocation. Utilities in the Shadow Area could be temporarily affected due to the resulting subsidence.

Surface Disturbances

One public water line segment is present in the footprint of the East Refuse Disposal Area. This water line would likely need to be relocated in order to maintain access to the line for routine maintenance and inspection. Relocation of the water line would be done in close coordination with the associated utility company and would, thus, mitigate Project effects.

Coal Extraction-Related Effects

Planned subsidence would result in temporary impacts to utilities in the Shadow Area. Utility components may become damaged, broken, or out of alignment as a result of subsidence. Subsidence could temporarily affect communications, water, and electric utility lines that follow public roadways.

Sugar Camp has existing agreements or would pursue agreements with governmental bodies and utility companies responsible for all utility lines expected to be affected by subsidence. Such agreements, to be negotiated in advance of subsidence, would allow the implementation of measures designed to prevent or minimize subsidence damage and/or outline a timely procedure for the repair or replacement of damaged utility infrastructure following subsidence. These agreements would vary in scope and content and would be site specific for each such facility. As an example, if a water line is broken or leaking, action would be taken immediately to repair it.

In accordance with 62 ILL. Adm. Code 1784.20 b) 8), the convenience and safety of the public would be a high priority in the development and implementation of such cooperative agreements. Sugar Camp would be required by IDNR-OMM to inform utility companies well in advance of subsidence to adequately prepare for subsidence effects. Sugar Camp would also be required to compensate utilities for repair of any damage caused by its mining activities. The effects of subsidence on utilities would therefore be minimal and short-term after preventive planning with utility companies and subsequent repair.

Cumulative Effects

Cumulatively, effects on utilities due to planned subsidence in portions of the overall 37,972-acre SBR No. 6 expansion area and proposed actions in the existing 2,420-acre surface effects area would be minimal and short-term due to preventive planning with government bodies and utility companies and subsequent repair.

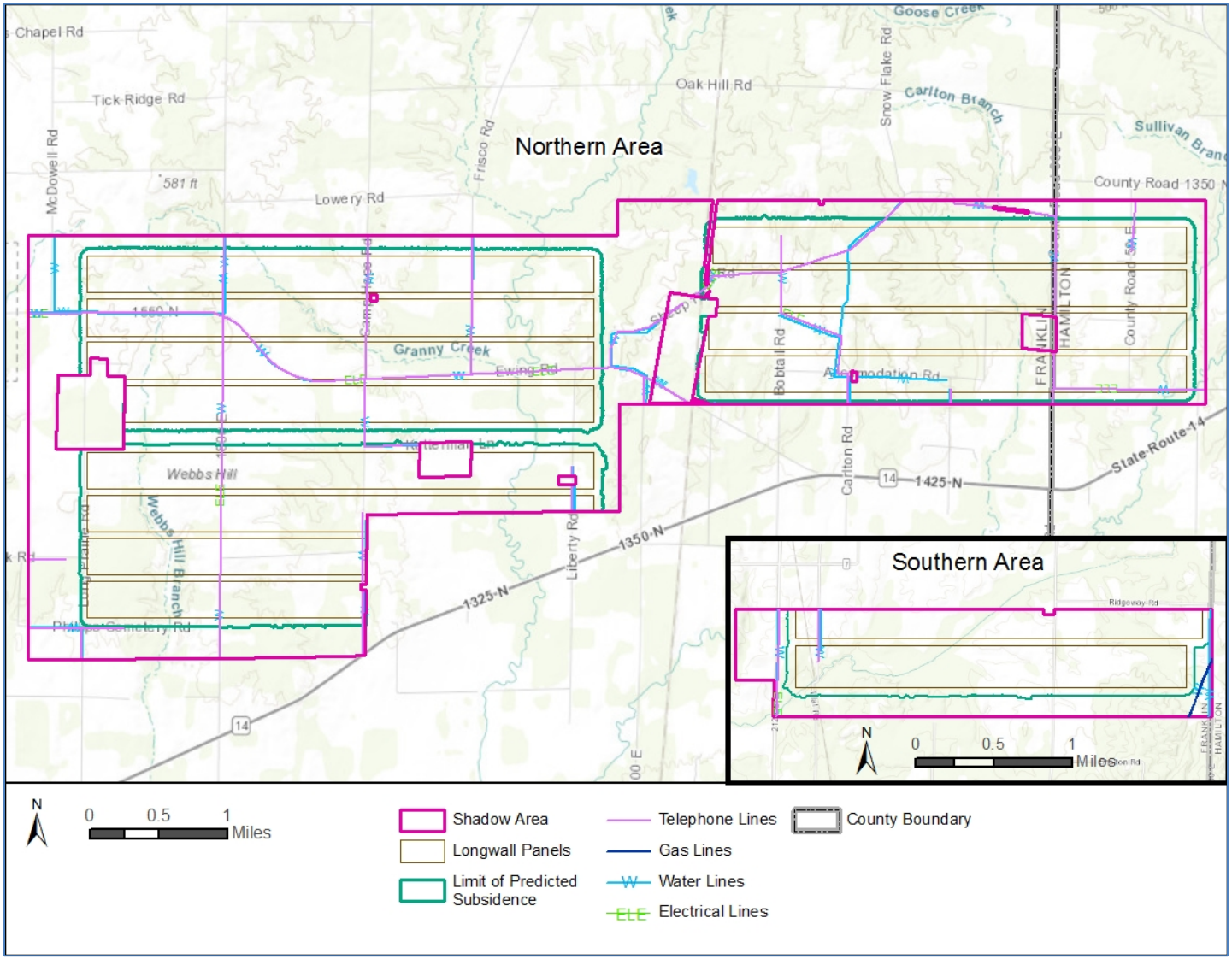


Figure 3-14. Shadow Area Infrastructure

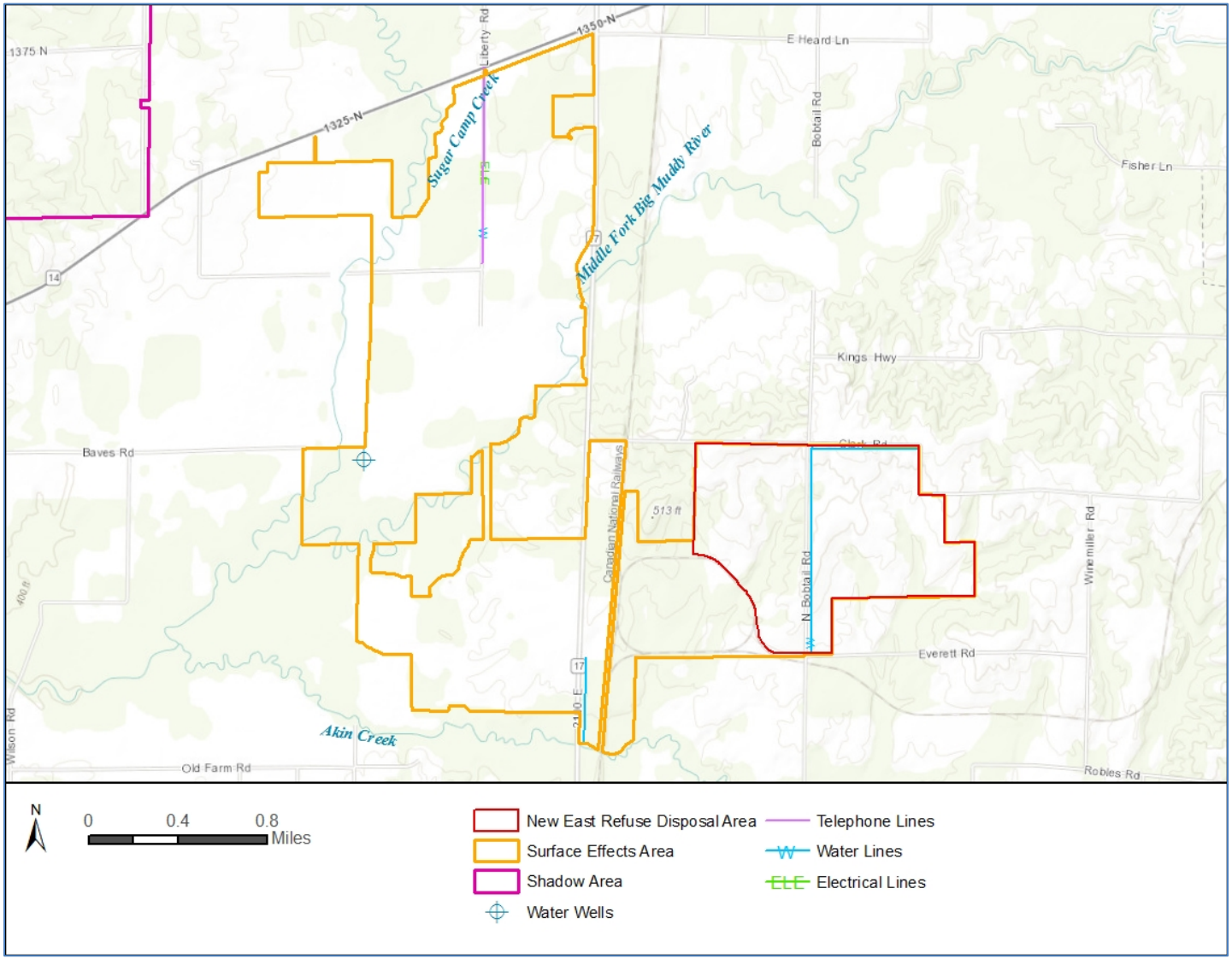


Figure 3-15. Surface Effects Area Infrastructure

3.9 Cultural Resources

This section describes the cultural resources in the Project Area and the effects of the alternative actions on those cultural resources. Cultural resources are properties and places that illustrate aspects of prehistory or history or have long-standing cultural associations with established communities and/or social groups. Cultural resources may include archaeological sites, unmodified landscapes and discrete natural features, modified landscapes, human-made objects, structures such as bridges or buildings, and groups of any of these resources, sometimes referred to as districts. Information sources utilized for this section include the National Register of Historic Places (NRHP) webmap maintained by the National Park Service, the IHPA Historic Architectural Resources GIS System (HARGIS), the Illinois Inventory of Archaeological Sites (IIAS), and the IDOT Historic Bridges of Illinois database. The results of a survey of potentially historic structures conducted by Sugar Camp for SBR No. 6 were also utilized.

3.9.1 Affected Environment

Once identified, these resources are evaluated for inclusion in the NRHP maintained by the National Park Service. Tangible cultural resources may qualify for inclusion in the NRHP if they are 50 years of age or older (unless in exceptional cases) and if found to embody one or more of four different types of values, or criteria, in accordance with 36 CFR § 60.4:

- *Criterion A:* association with events that have made a significant contribution to the broad patterns of our history.
- *Criterion B:* association with the lives of persons significant in our past.
- *Criterion C*: embodiment of the distinctive characteristics of a type, period, or method of construction; representative of the work of a master; possessing high artistic values; or representative of a significant and distinguishable entity whose components may lack individual distinction.
- *Criterion D*: cultural resources that have yielded, or may be likely to yield, information important in prehistory or history.

TVA has determined the area of potential effects (APE) to cultural resources as the footprint of the Shadow Area (12,125 acres) as well as the five Bleeder Shaft Facilities (27 acres in total within the Shadow Area), including the installation of associated utilities needed to operate the Bleeder Shaft Facilities, where physical effects could occur, as well as areas within a half-mile radius of the APE within which the Project would be visible, where visual effects on aboveground resources could occur. This area is referred to herein as the Viewshed. TVA initiated consultation with IHPA (Illinois SHPO) regarding the Project on November 7, 2019 (Appendix B).

Native Americans occupied southern Illinois beginning at least 12,000 years ago (Evans et. al, 1997; Moffat 2002). Fertile river floodplains and rich hunting grounds supported lifestyles that typically transitioned from nomadic hunting and gathering to settled agricultural. French explorers first encountered the Native American peoples of Illinois in the late 1600s, which led to alliances and conflicts. In the 1830s, most Native American groups were forced to move west of the Mississippi River. By the mid- to late 1800s, Euro-American settlement was occurring across the state. These immigrants built many of the farmsteads once scattered around the Project Area and vicinity. Subsequent modern development has caused the alteration or removal of many of these farmstead structures; however, some do

remain (Muller 1986; Schroder 2004). The remnants of many of these human occupations of southern Illinois could potentially be found in the Project Area.

According to the IIAS, the Project Area is located in an area with a relatively high probability for archaeological sites due to being in a rich watershed area. Ten archaeological sites have been recorded within the Project Area where new disturbances are proposed. All of these sites are located at or adjacent to the proposed footprint of the new East Refuse Disposal Area. Nine of these sites were recorded during surveys conducted by Sugar Camp in relation to their mining operations. All but one of the sites date to the historical period; the remaining site dates to the Precontact period. Based on research to date, as documented by the IIAS, none of these sites have been recommended eligible for the NRHP.

Database research indicated that there are three potentially historic buildings within the Project Area or the adjacent Viewshed. One of these buildings, the Webb Store (HARGIS No. 300664), is within the Project Area. The other buildings are residential and/or farmstead buildings recorded during the structure survey for SBR No. 6 and located in rural areas outside of Benton and Thompsonville. Five churches and three cemeteries of unknown age were also identified during the structure survey for SBR No. 6; these are present within the Shadow Area. If any of these are determined to be of potential historic age, they will be evaluated for NRHP eligibility. There are no known historic bridges in the Project Area.

Federal agencies are required to consult with Native American tribes that may have significant religious or cultural resources in a Project region. The tribes that may have interests in this are listed in Section 1.5.4.3. TVA initiated consultation with these tribes on November 7, 2019. To date, two responses has been received, from the Miami Tribe of Oklahoma and Osage Nation (Appendix B). The Osage Nation expressed interest in the area and requested continued consultation as the facilities are identified.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to cultural resources.

As the locations of bleeder shaft facilities are identified, Sugar Camp will conduct Phase I cultural resources surveys of the potentially affected areas and provide to IHPA for consultation, as they have done for past mining activities. Sugar Camp is required by IDNR to repair or compensate owners for structural damage caused by subsidence. Impacts to historic properties from subsidence associated with the No Action Alternative would be minor and temporary.

3.9.2.2 Action Alternative

Under the Action Alternative, TVA would approve Sugar Camp's mining plan. This could result in impacts to cultural resources due to construction of surface facilities. Per an agreement between IHPA and IDNR, shadow areas are considered exempt activities that have no effect on historic properties (IDMM 1994). TVA will continue to consult with IHPA and interested tribes regarding Project effects to cultural resources throughout the environmental review process.

Surface Disturbances

The specific locations of the Bleeder Shaft Facilities within the Shadow Area are not currently known. Due to the size and scope of the Project, TVA indicated to IHPA that the approach to determining effects to cultural resources would proceed under phases, as provided under 36 CFR § 800.4(b)(2) and § 800.5(c)(1). Once the locations of the Bleeder Shaft Facilities and any associated components are identified, TVA will conduct a Phase I cultural resources survey of the APEs defined for these areas and provide to IHPA for consultation.

The construction of the East Refuse Disposal Area would directly impact seven known archaeological sites. Based on research conducted to date, none of these sites have been recommended eligible for the NRHP. TVA is now initiating coordination with IHPA for this portion of the Project Area.

The construction and operation of the Bleeder Shaft Facilities and the East Refuse Disposal Area would cause minor visual changes to the overall landscape viewshed. The bleeder shaft facilities would be dismantled and their sites restored at the end of their useful lives, as described in Section 2.1.2.3. The East Refuse Disposal Area would be capped with soils and left in place at the end of its operational life and revegetated according to the reclamation plan.

Coal Extraction-Related Effects

Per the *Programmatic Agreement between the Illinois Historic Preservation Agency and the Illinois Department of Natural Resources*, “shadow areas in which there will be no surface disturbance” are a class of exempt activities that are “considered to have no effect on historic properties” (IDMM 1994). TVA agrees that no archaeological resources would be affected by subsidence, where no surface disturbance is proposed. Such surface disturbances may include re-contouring activities to restore drainage patterns altered by subsidence.

Subsidence can affect structures by causing cracks or shifts in building foundations. A pre-subsidence survey of structures has been conducted by Sugar Camp in regards to the Project, and a post-subsidence survey will be conducted to assess damage caused by subsidence. If needed, structures can be braced prior to subsidence to minimize damage and can be repaired afterward. Sugar Camp is required by IDNR to repair or compensate owners for structural damage caused by subsidence. Thus, any Project impacts to historic properties from subsidence would be temporary.

Cumulative Effects

Cumulative effects to cultural resources, such as impacts to the viewsheds of aboveground resources, structural damage to architectural resources, or effects to NRHP-eligible archaeological sites, have the potential to occur in relation to the overall 37,972-acre SBR No. 6 expansion area and proposed actions in the existing 2,420-acre surface effects area. However, these impacts would be avoided, minimized, or mitigated, per IDNR-OMM and IHPA requirements, and in consultation with IHPA and interested tribes.

3.10 Solid and Hazardous Waste

This section describes the potentially affected environment for solid and hazardous waste. Solid waste consists of a broad range of materials that include refuse, sanitary wastes, contaminated environmental media, scrap metals, nonhazardous wastewater treatment plant sludge, nonhazardous air pollution control wastes, various nonhazardous industrial waste, and other materials (solid, liquid, or contained gaseous substances).

Hazardous materials are defined as substances or materials that have been determined to be capable of posing an unreasonable risk to health, safety and property. Hazardous material includes hazardous substances and hazardous wastes. Under the Resource Conservation and Recovery Act (RCRA), a waste is determined to be a hazardous waste if it is specifically listed on one of four lists (the F, K, P and U lists) found in title 40 of the Code of Federal Regulations (CFR) in sections 261.31 – 261.33. A waste can also be determined to be hazardous if it exhibits one or more of the following hazardous waste characteristics, as defined in 40 CFR 261.21 through 261.24: ignitability, corrosivity, reactivity, or toxicity.

Hazardous materials and management of these materials are regulated under a variety of federal laws including the Occupational Safety and Health Administration (OSHA) standards, Emergency Planning and Community Right to Know Act and RCRA subtitle C.

3.10.1 Affected Environment

The IDNR-OMM Permit No. 382 describes several methods for hazardous waste disposal throughout the Sugar Camp site, as well as the disposal of refuse from the coal preparation process.

Two refuse disposal areas (RDAs) are located within the facility (see Figure 1-2) and have remaining capacity, though the actual capacities are unknown at this time. The most recent RDA located directly north of the existing Permit No. 382 area, is used almost exclusively for disposal of both coarse and fine coal refuse produced during the coal preparation process. Course refuse generally consists of inert non-coal (rock material) fragments separated from the unprocessed coal upon extraction via a series of shakers. Fine refuse typically exits the separation process as a slurry and generally shares many properties with the associated coal seam, including silicon, aluminum, and sulfur compounds.

In 2014, a reverse osmosis (RO) treatment plant was installed to process water with high chloride concentrations that was infiltrating the mine workings. The source of the high chloride water is presumably located directly above the No. 6 coal seam and as the longwall operation progresses and the rock roof fractures, this water drains into the mine workings. This high chloride water is pumped from the underground workings to two surface clarifying/settling ponds before being pumped to the RO treatment plant. The RO plant, located near the preparation plant, treats the high chloride water into two waste streams. About 75 percent of the treated water (approximately two million gallons per day) is pumped directly to Pond 001, where it is then utilized by the preparation plant. The second waste stream is a liquid concentrate, consisting of approximately 675,000 gallons per day. About half of this second waste stream is disposed of in the two on-site deep injection wells, while the remaining half is sent to the existing RDA. The RO treatment plant, combined with the deep injection wells, was the best available treatment option and this treatment option has been approved by both the Illinois EPA and the Department.

3.10.2 Environmental Consequences

3.10.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no solid or hazardous wastes would be produced as a result of the mining and processing of additional TVA-owned coal. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per IDNR permit requirements.

The existing refuse disposal areas and the new East Refuse Disposal Area would all potentially store refuse from processing of previously approved TVA-owned coal and privately owned coal. The existing Coal Preparation Plant would continue to be managed under an SPCC Plan for onsite bulk oil in containment, in accordance with applicable regulations. Subsidence does not generate additional solid or hazardous waste.

3.10.2.2 Action Alternative

Under the Action Alternative, TVA would approve Sugar Camp's mining plan, which would include mining of approximately 185.6 million tons of unprocessed TVA-owned coal, at an average annual production rate of 7.1 million tons of processed TVA-owned coal per year during longwall mining. Preparation of the unprocessed coal is anticipated to produce approximately 92.8 million tons of coal refuse for disposal in the existing refuse disposal areas and the East Refuse Disposal Area.

Sugar Camp does not consider any of the refuse onsite as waste, except for bulk oil stored in underground containment for use in mining equipment. Sugar Camp maintains a Spill Prevention, Control, and Countermeasure (SPCC) Plan for onsite bulk oil in containment and report usage to USEPA, in accordance with applicable regulations. If TVA approves Sugar Camp's mining plan, quantities of bulk oil stored and used onsite are expected to exceed the quantities stored and used if the Proposed Action is not approved.

Surface Disturbances

The mining plan includes the construction of five Bleeder Shaft Facilities associated with the mining of TVA-owned coal. These planned activities would temporarily disturb approximately 25 acres of surface lands within the 12,125-acre Shadow Area at five different locations. Topsoil material would be removed and placed in a stockpile for future reclamation. Excavated consolidated material would be utilized for road and parking area base construction or placed in a stockpile for future reclamation. Therefore, construction of the five planned Bleeder Shaft Facilities will not result in generation of solid or hazardous waste requiring management other than what is described herein.

The extracted coal, both TVA-owned and privately owned, would be processed at the existing Coal Preparation Plant. The plant is located within the 2,420-acre surface effects area, outside of the 12,125-acre Shadow Area. The plant is currently operating and was approved by IDNR in 2008. Water used at the plant is treated on-site. Sugar Camp holds an NPDES permit to Coal Preparation Plant has a set capacity that would not increase with the addition of the 186 million tons of unprocessed TVA-owned coal, which would result in generation of approximately 92.8 million tons of coal refuse that would not have otherwise been generated if TVA does not approve the Proposed Action (Appendix B).

Sugar Camp proposes to construct an East Refuse Disposal Area to provide additional long-term storage of refuse from the Coal Preparation Plant (see Figure 2-4). If approved by

IDNR-OMM, the East Refuse Disposal Area would be used to store refuse from the processing of privately owned and TVA-approved coal mined in the future, as well as TVA-owned coal mined under the Proposed Action. This new disposal area is necessary regardless of whether the TVA-owned coal is mined in the future.

Approval of the Action Alternative will result in an increase of coal refuse disposed in the East Refuse Disposal Area. Based on data provided by Sugar Camp, preparation of 186 million tons of unprocessed coal will result in generation of approximately 92.8 million tons of coal refuse to be disposed. Reclamation of the East Refuse Disposal Area would be completed as described in Chapter 2.

Coal Extraction-Related Effects

Planned subsidence within the Shadow Area would not generate additional solid or hazardous waste, and thus, no impacts would occur in relation to waste.

Cumulative Effects

Cumulative impacts would be avoided or minimized by maintaining SPCC plans at all ongoing and proposed coal facilities, including the bleeder shaft facilities associated with the overall SBR No. 6 mine expansion and existing and proposed refuse disposal areas in the existing 2,420-acre surface effects area. No cumulative impacts would occur due to planned subsidence in portions of the overall 37,972-acre SBR No. 6 expansion area, as subsidence does not generate additional solid or hazardous waste.

3.11 Human Health and Safety

This section describes the potentially affected environment and environmental consequences for human health and safety. In this section, safety is discussed in the context of relevant regulatory requirements under Occupational Safety and Health Administration (OSHA), Federal Mine Safety and Health Act, and other types of hazard assessment and prevention.

Scoping comments recommended that the EIS address occupational health and safety measures, including safety related to humans and infrastructure during subsidence. Subsidence and pollutant emissions are safety issues that could potentially occur at the facility. In the context of evaluating the project impacts, “safety” is interpreted as engineering design, operation, and handling of project infrastructure, equipment, and materials in a manner that seeks to reduce hazards and prevent the occurrence of incidents and accidents (IFC 2007).

3.11.1 Affected Environment

Mine safety is regulated by several agencies, including IDNR Mine Safety and Training Division, OSHA, and U.S. Department of Labor’s Mine Safety and Health Administration (MSHA). Safety requirements are a condition of obtaining regulatory permits and approvals to construct, operate, and close mines. Safety issues are typically addressed under state and federal regulatory programs designed to ensure physical safety pertaining to engineering design and structural integrity of the project components and infrastructure, and safe storage, use, transportation, and disposal of materials, product, and waste streams. It also includes operational safety for workers, and the safety of visitors to the facility and the general public in the vicinity.

MSHA works to prevent death, illness and injury from mining and promote safe and healthful workplaces for U.S. miners. MSHA carries out the provisions of the Federal Mine Safety and Health Act of 1977 as amended by the Mine Improvement and New Emergency Response Act of 2006. The agency develops and enforces safety and health rules for all U.S. mines regardless of size, number of employees, commodity mined, or method of extraction. MSHA also provides technical, educational and other types of assistance to mine operators. MSHA regulates the health and safety of miners predominantly using 30 CFR part 75 for underground and 30 CFR part 77 on the surface.

3.11.2 Environmental Consequences

3.11.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the proposed mining of TVA-owned coal would occur to health and human safety. Impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur, but these impacts would continue to be minimized or mitigated, per MSHA and OSHA regulations and IDNR Mine Safety and Training Division.

Sugar Camp would avoid subsidence-related damages to private property or to reimburse affected parties for those damages by coordinating pre- and post-subsidence surveys with property owners.

3.11.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining. This may result in safety impacts due to the effects of surface disturbances or subsidence, but any impacts would be minimized or mitigated through compliance with MSHA, OSHA, IDNR Mine Safety and Training Division, and other relevant regulatory programs. These regulations require site-specific plans that will be submitted to and approved by MSHA before implementation.

Surface Disturbances

Sugar Camp complies with MSHA and OSHA through the implementation of numerous site-specific plans for each mining operation. Sugar Camp would follow CFR Part 70 for all underground components of the mine and CFR 30 Part 77 for mandatory safety standards for all surface components of the mine. Sugar Camp houses copies of their Ventilation Plan, Roof Control Plan, and Emergency Response Plan at each mining site. Plans for refuse disposal areas, shaft facilities, and seal installations are technically evaluated, reviewed, and approved by MSHA prior to construction. Sugar Camp also maintains a SPCC Plan and Emergency Management and Fire Fighting plans at the mining site.

As shown on Figure 2-1, fans would be installed at the top of the bleeder ventilation shafts associated with the Bleeder Shaft Facilities to increase the rate of circulation and reduce the risk of explosions and fires. Methane in concentrations between five and 15 percent can be explosive (Kissell 2006). Safety regulations usually require that methane levels be kept lower than one percent for health and safety of mine workers.

Sugar Camp would backfill and seal mine openings, such as bleeder shaft and boreholes, in accordance with pertinent state and federal regulations. The boreholes would be permanently sealed within 60 days of inactivity. The bleeder shaft and any boreholes would be plugged from top to bottom according to all MSHA and IDNR regulatory standards after they are no longer needed.

Coal Extraction-Related Effects

The operation of underground mining equipment could contribute to pollutant emissions that could pose a safety threat to workers in the underground longwall mining areas. In order to maintain safe levels of pollutants within the mine, safety regulations require the use of filters on diesel- powered mining equipment to minimize diesel exhaust emissions on most underground diesel machinery. Other equipment is electrically powered and does not contribute directly to emission levels.

In its application for UCM Permit No. 382, Sugar Camp was required to describe how mine stability is maximized to prevent unplanned subsidence. Sugar Camp used the Analysis of Retreat Mining Pillar Stability (ARMPS) program to calculate the stability factor by using the loads applied to and the load bearing capacities of coal pillars. The ARMPS program uses an empirical method with an extensive amount of case histories incorporated for calibration. It is the industry standard for pillar design. Site-specific strength values for coal pillars and floor are developed to ensure an adequate factor of safety for roof stability and to prevent unplanned subsidence. Plate testing would be conducted in conventional room-and-pillar sections within the first 1,000 feet of entering a mine area. Should any changes in mine stability or conditions be encountered, a more detailed study of floor, roof and pillars would be performed at that time. As stated in the UCM Application, “the subsidence control plan…will serve to avoid damage to any surface features to assure compliance with 62 Ill. Adm. Code 1817.121(d).”

Sugar Camp is required to avoid subsidence-related damages to private property or to reimburse affected parties for those damages. Planned subsidence is predictable, uniform, and minimizes damage to surface structures as mining proceeds. Sugar Camp would coordinate with property owners prior to and after subsidence as part of a pre- and post-subsidence survey of structures, such as buildings and bridges, as described in Section 2.1.2.3. Sugar Camp would also implement mitigation measures outlined in Section 2.3 to minimize potential safety impacts caused by subsidence. These mitigation measures include the repair of any damage to buildings or other structures, roads, utilities, or drainage caused by subsidence.

Cumulative Effects

Sugar Camp’s ongoing and proposed actions associated with the overall 37,972-acre SBR No. 6 mine expansion and in the existing 2,420-acre surface effects area would not contribute to cumulative adverse impacts to human health and safety due to compliance with regulatory safety programs.

3.12 Socioeconomics and Environmental Justice

This section gives an overview of existing socioeconomic and environmental justice conditions for Franklin and Hamilton counties and the potential impacts associated with the No Action and Action Alternatives. Components of socioeconomic resources that are analyzed include the local economy, employment, income, poverty status, population, and ethnicity. Components of environmental justice that are presented include the proportions of the local population that are minority and low-income and the potential for effects to these populations.

The Project Area is located in an unincorporated, primarily rural portion of eastern Franklin County and western Hamilton County, approximately five miles north-northwest of the Town

of Somerville. The Project Area overlaps U.S. Census Bureau (USCB) 2010 Census Tract (CT) 412, in Franklin County, and a small portion of CT 9733, in Hamilton County. Generally, CT 412 encompasses the Project surface effects area, including the site of the East Refuse Disposal Area, and the majority of the Shadow Area. CT 9733 encompasses a small eastern portion of the northern Shadow Area.

Environmental justice is analyzed in accordance with E.O. 12898 (59 FR 7629), which directs federal agencies to identify and address, as appropriate, potential disproportionately high and adverse effects of their programs, policies, and activities on minority and low-income populations. Although TVA is not subject to this E.O., its policy is to consider environmental justice in its environmental reviews.

Council of Environmental Quality (CEQ) guidance directs identification of minority populations when either the minority population of the affected area exceeds 50 percent or the minority population percentage of the study area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997). CEQ defines minority populations as people who identify themselves as Asian or Pacific Islander, American Indian or Alaskan Native, Black (not of Hispanic origin), or Hispanic. Due to including one of these minorities, those indicating two or more races are also considered minorities. Minority populations were defined as those exceeding 50 percent.

CEQ guidance specifies that low-income populations are to be identified using the annual statistical poverty threshold from the USCB Current Population Reports Series P-60 on Income and Poverty. The USCB-provided 2017 poverty threshold for individuals under age 65 was $12,752, and the official poverty rate for the United States (U.S.) as a whole in 2017 was 12.3 percent (USCB 2018). Due to availability, low-income populations were defined as those with poverty rates estimated for all people that are above the U.S. poverty rate of 12.3 percent.

3.12.1 Affected Environment

The coal mining industry has historically been significant to the economy of southern Illinois, including the Project Area counties, because of the rich mineral resources within the Illinois Coal Basin. Coal mining remains one of Franklin County's largest industries with two active underground mines. Several coal-related product and service companies are located in the county to meet the needs of underground mining (FREDCO 2020). A comparison of industries within Franklin and Hamilton counties and the State of Illinois is shown in Table 3-9. Private, non-farming industries includes mining. While land use surrounding the Project Area is predominantly agricultural, farm employment comprises a smaller percentage than private, non-farming industries. Besides mining, other private, non-farming industries include retail, manufacturing, and professional services.

Table 3-9. 2018 Employment Data

Area	Total Employment	Farming	Private, Non-farming industries	Government
Franklin County	14,029	652	11,174	2,203

Area	Total Employment	Farming	Private, Non-farming industries	Government
Hamilton County	3,821	618	2,652	549
State of Illinois	7,952,370	74,212	7,008,189	869,969

Source: U.S. Bureau of Economic Analysis (BEA) 2018

Franklin and Hamilton counties have lower median household incomes than across the state and nation (Table 3-10). CTs 412 and 9733 both have higher median household incomes and lower percentages of people below the poverty level as compared with their respective county. However, CT 412 has a poverty rate for all people that, while lower than the county rate, is higher than the 2017 official U.S. poverty rate of 12.3 percent, as reported in the USCB Current Population Reports Series P-60 on Income and Poverty.

Table 3-10. Median Household Income and Poverty Status.

Area	Median Household Income, dollars	Percentage of all people below poverty level in past 12 months
United States	57,652	14.6
State of Illinois	61,229	13.5
Franklin County	39,454	19.9
CT 412	45,885	16.8
Hamilton County	47,293	13.9
CT 9733	59,891	10.2

Sources: USCB 2013 – 2017 American Community Survey

Minority populations constitute just over one percent of the total population in Franklin and Hamilton Counties, as of the 2010 U.S. Census of Population (Table 3-11). This percentage is much lower than state and national levels. CTs 412 and 9733 are also predominantly Euro-American populations.

Table 3-11. Population and Percentage of Minority Populations

Area	Total Population	Minority Population	Percentage Minority Population
United States	308,745,538	76,183,200	24.7
State of Illinois	12,830,632	3,362,773	26.2

Area	Total Population	Minority Population	Percentage Minority Population
Franklin County	39,561	478	1.2
Census Tract 412	3,750	28	0.7
Hamilton County	8,457	93	1.1
Census Tract 9733	2,784	29	1.0

Source: USCB 2010

3.12.2 Environmental Consequences

This section describes the potential impacts to socioeconomic resources should the No Action or Action Alternative be implemented. Social and economic issues considered for evaluation include change in expenditures for goods and services and short and long-term impacts on employment and income.

This section also describes the potential environmental justice impacts should the No Action or Action Alternative be implemented. According to the CEQ, adverse health effects to be evaluated within the context of environmental justice impacts may include bodily impairment, infirmity, illness, or death. Environmental effects may include ecological, cultural, human health, economic, or social impacts. Disproportionately high and adverse human health or environmental effects occur when the risk or rate of exposure to an environmental hazard or an impact or risk of an impact on the natural or physical environment for a minority or low-income population is high and appreciably exceeds the impact level for the general population or for another appropriate comparison group (CEQ 1997).

3.12.2.1 The No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no impacts associated with the mining of additional TVA-owned coal would occur to socioeconomics and environmental justice. Positive socioeconomic impacts from the ongoing mining of previously approved TVA-owned coal and privately owned coal would continue to occur. Any environmental justice impacts would continue to be avoided due to compliance with IDNR permit requirements to avoid, minimize, or mitigate adverse effects.

Approximately 10 to 15 workers would be employed to construct the four bleeder shaft facilities over an approximate six to nine-month period. Construction of the East Refuse Disposal Area would provide employment for about 20 people over an approximate two-year period. These employment needs would likely create some new local job opportunities during construction of the Project, while mining operations would continue to have positive effects on the local economy. While low-income populations are present in the vicinity of Sugar Camp Mine No. 1, the No Action Alternative would not disproportionately adversely affect environmental justice populations. In addition, the economic benefits may have a particular benefit to low-income populations in the mine vicinity.

3.12.2.2 Action Alternative

Under the Action Alternative, TVA would approve the proposed mining. Positive socioeconomic impacts from the mining of additional TVA-owned coal would occur. Any environmental justice impacts would be avoided due to compliance with IDNR permit requirements to avoid, minimize, or mitigate adverse effects.

Over an approximate nine-month period, about 15 workers would be employed to construct the five Bleeder Shaft Facilities in the Shadow Area. Construction of the East Refuse Disposal Area would provide employment for about 20 people over an approximate two-year period. These jobs would likely create some new local job opportunities during construction of the Project. The mining of TVA-owned coal and the processing of that coal would be carried out by current Sugar Camp employees, with no additional non-construction hiring attributable to the Project. The mining of the TVA-owned coal under the Action Alternative would, however, provide employment for a longer period of time than would otherwise occur.

Overall, long-term beneficial economic impacts would result from implementation of the Action Alternative, including the purchase of materials, equipment, and services, and long-term increases in employment and income. These increases would be local or regional, depending on where the goods, services, and workers are obtained. Indirect economic effects would also occur with implementation of the Action Alternative. These would generally derive from the expenditure of wages earned by the workforce involved in construction activities and mining operations.

While low-income populations are present in the Project Area, the Project would not disproportionately affect environmental justice populations. The overall impacts of the Action Alternative, as described in other sections in this chapter, would be minor, and off-site impacts would be negligible. As such, no disproportionately high or adverse direct or indirect impacts on minority or low-income populations due to human health or environmental effects are expected to result from the Action Alternative. In addition, the minor beneficial impacts to employment and income levels in the local region could provide additional opportunities to nearby environmental justice populations.

Cumulative Effects

Overall, long-term, cumulative beneficial economic impacts would result from implementation of the Action Alternative in combination with other SBR No. 6 activities and ongoing and proposed actions in the existing 2,420-acre surface effects area. Indirect, cumulative economic effects would also occur from the expenditure of wages earned by the workforce involved in construction activities and mining operations. No cumulative adverse impacts would occur to environmental justice populations present in the vicinity of Sugar Camp Mine No. 1; however, cumulative beneficial impacts to these populations may be realized.

3.13 Noise and Visual

This section provides an overview of the existing ambient sound environment in the Project Area, and the potential impacts to the ambient sound environment that would be associated with the No Action and Action Alternative. This section also describes the visual resources in and surrounding the Project Area and the potential impacts on these visual resources that would be associated with the alternatives.

3.13.1 Affected Environment

Noise is generally described as unwanted sound, which can be based either on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as sound level. The threshold of human hearing is approximately zero dB, and the threshold of discomfort or pain is around 120 dB.

Noise levels are computed over a 24-hour period and adjusted for nighttime annoyances to produce the day-night average sound level (DNL). DNL is the community noise metric recommended by the USEPA and has been adopted by most federal agencies (USEPA 1974). A DNL of 65 A-weighted decibels (dBA) is the level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities such as construction. The A-weighted sound level represents the approximate frequency response characteristic of the average young human ear. Areas exposed to a DNL above 65 dBA are generally not considered suitable for residential use. A DNL of 55 dBA was identified by USEPA as a level below which there is no adverse impact (USEPA 1974). For reference, approximate noise levels (measured in dBA) of common activities/situations are provided in Table 3-12.

Table 3-12. Noise Levels of Common Activities/Situations

Activity/Event	dBA
Lowest audible sound to person with average hearing	0
Quiet rural, nighttime	25
Quiet urban, nighttime	45
Large business office	60
Normal speech at three feet	70
Noisy urban area, daytime	75
Food blender at three feet	90
Gas lawn mower at three feet	100
Jet flyover at 1,000 feet	110

Source: Caltrans 2013

Noises occurring at night generally produce a greater annoyance than do noises of the same levels occurring during the day. People generally perceive intrusive noise at night as being 10 dBA louder than the same level of noise during the day. This perception is largely because background environmental sound levels at night in most areas are about 10 dBA lower than those during the day (USEPA 1974).

Ambient noise at the Project Area consists mainly of agricultural, road and rail transportation, rural, and natural sounds such as wind and wildlife. Generally, noise levels in these types of areas range from 45 to 55 dBA (USDOT 2015); although noise levels near the existing Coal Preparation Plant and refuse disposal areas would be considerably higher than surrounding areas. Based on aerial imagery, four residences are located along Clark Road within 1,000 feet of the East Refuse Disposal Area. Because the exact locations of

the Bleeder Shaft Facilities are not known, it is not possible to quantify the current number of residences or other sensitive noise receptors within the Shadow Area that could be affected. However, land use within the Shadow Area is primarily agricultural with sparse residences and businesses.

In addition to residences, sensitive noise receivers can include schools, churches, cemeteries, public parks, and historic buildings or sites. During the mine permitting process, 10 known or potentially historic buildings were identified in the vicinity of the Project Area. Five churches and three cemeteries were also identified within the Shadow Area. No schools were identified within the Shadow Area or East Refuse Disposal Area.

Visual resources are the visual characteristics of a place and include both natural and manmade attributes. Visual resources are important as they can determine how an observer experiences a particular location. For example, an agricultural setting would elicit very different feelings in an observer than a manufacturing plant or an industrial area. Visual resources are important to people living in the area, people going through an area, and in the context of historical and culturally significant settings. The experience of a historically significant building can be altered if the surrounding visual character is changed. A viewshed is defined as the environment that can be seen from a certain vantage point, a viewpoint is the vantage point from where the visual character is seen.

The Project Area is east of the City of Benton. The regional character is mostly rural, with agricultural and pasture fields, flat terrain with rolling hills, forested areas, and generally small towns and communities. Immediately adjacent to the East Refuse Disposal Area is a rail line, agricultural fields, the Coal Preparation Plant, and sparse residences and businesses. Existing components associated with the Coal Preparation Plant include reclaim tunnels, parking lots, access roads, drainage control structures, office buildings, changing rooms, assembly rooms, warehousing facilities, storage facilities, elevator facilities, ventilation facilities, refuse disposal areas, overland conveyors, screens, a crusher, power distribution facilities, power lines, water lines, a rail loadout, stockpile areas, and other associated facilities. The viewsheds constitute a predominantly agricultural setting, with existing coal infrastructure along North Thompsonville Road. The visual character of the Shadow Area is similar to the regional character described above.

3.13.2 Environmental Consequences

3.13.2.1 No Action Alternative

Under the No Action Alternative, TVA would not approve the proposed mining plan. Thus, no noise or visual impacts associated with the mining of additional TVA-owned coal would occur. Noise and visual impacts from the ongoing mining and processing of previously approved TVA-owned coal and privately owned coal would continue to occur as a result of the construction and operation of four bleeder shaft facilities, the East Refuse Disposal Area, and the continued operation of the Coal Preparation Plant and associated facilities.

Noise and visual impacts would occur in the vicinity of the Coal Preparation Plant during the life of the mining operations and in sporadic locations during the operational life of bleeder shaft facilities. The bleeder shaft facilities would likely be located in rural, agricultural areas and would cause minor noise and visual impacts to surrounding residences and businesses. During construction and blasting, noise impacts would be avoided or mitigated, in compliance with IDNR permit requirements. While the East Refuse Disposal Area would have a similar operational life as the bleeder shaft facilities, this facility would have a long-term visual effect, lessening over time as this soil-capped impoundment revegetates.

3.13.2.2 Action Alternative

Under the Action Alternative, TVA would approve Sugar Camp's mining plan. This would result in noise and visual impacts due to new surface facilities.

Surface Disturbances

Under the Action Alternative, noise would be generated by heavy equipment used to construct the Bleeder Shaft Facilities. As detailed in Section 2.1.2, blasting and drilling would be used to construct the Bleeder Shaft Facilities. Exact locations of the Bleeder Shaft Facilities are not known; thus, it is not possible to quantify the current number of homes or businesses within the Shadow Area or distance to the noise-generating source. However, because land use within the Shadow Area is primarily agricultural with sparse residences and businesses, the Bleeder Shaft Facilities are not likely to have adverse noise or visual effects.

The Bleeder Shaft Facility locations will initially be developed with small dozers and a loader removing and stockpiling topsoil on the perimeters of the site for later reclamation of the site. A Frontier-Kemper 350MT Blind Drilling System would be used to complete the bleeder shaft. Residences close to the Bleeder Shaft Facilities would hear an increase in noise as a result of construction activities. Construction-related noise levels would be about 110 decibels (dB), which are greater than 45 to 55 dB associated with rural areas. However, noise decreases by 6 dB with every doubling of distance from a noise-generating source, and the Bleeder Shaft Facilities are likely to be placed in agricultural areas away from residences and businesses.

Because blasting would be utilized for the construction of the Bleeder Shaft Facilities, a Blasting Plan would be developed for each location in accordance with 62 IL Adm. Code 1817.61 d) 2). There would be no blasting within 1,000 feet of a public building, school, church, community building or institutional building. All surface blasting would be conducted between sunrise and sunset unless otherwise approved. Blasting would be conducted in a manner that protects the public, workers and property. The air blast would be maintained below 133 dB and would be temporary in duration. These noise levels would end after completion of the shaft and are considered temporary and insignificant.

During normal operation, properties directly adjacent of the Bleeder Shaft Facilities could potentially hear noise such as trucks or machinery noises. Noise would also be generated by fans installed within the bleeder ventilation shaft; some of this noise would be shielded by the vent housing, as well as by surrounding topography and vegetation. Operational noise generated by the bleeder shaft fan would be constant. However, due to the attenuation from the distance, noise levels at the nearest residences would be comparable to normal ambient noise. The operational life of the Bleeder Shaft Facilities is expected to be approximately five years. After that time, the equipment would be removed, and no additional operational noise would be generated. Operational noise impacts of the Bleeder Shaft Facilities are expected to be minor.

Moderate noise impacts are also expected during construction and operation of the East Refuse Disposal Area. Residences on Clark Road north of the East Refuse Disposal Area would hear an increase in noise as a result of construction activities. As described above, construction-related noise levels would be about 110 dB, which is much greater than 45 to 55 dB associated with rural areas. Operation of the East Refuse Disposal Area over approximately 5 years would also result in noise impacts to surrounding residences and

drivers as a result of additional trucks or machinery noises. Noise impacts would end after the East Refuse Disposal Area is capped and reclaimed.

Visual impacts would occur during construction and operation of the Bleeder Shaft Facilities and the East Refuse Disposal Area; the extent of visual impacts would depend on the siting of the bleeder shaft facilities. Agricultural land within the East Refuse Disposal Area would be converted to a heavy industrial use. Visually speaking, the Bleeder Shaft Facilities and East Refuse Disposal Area would not be dramatically different from the current scenery in the Project Area. While the viewshed in the immediate vicinity would change from a mostly rural setting to an industrial one with the addition of these Project components, the broader viewsheds in the Project Area constitute a predominantly agricultural setting with localized existing coal infrastructure.

The construction of the Bleeder Shaft Facilities and East Refuse Disposal Area would change the visible environment of the Project Area. During construction, heavy machinery would be present, though this will not be out of place in comparison to the equipment used at the nearby Coal Preparation Plant and cultivation of the agricultural fields. Additionally, some tall vegetation would be removed, and part of the site would be graded, changing the contouring, coloring and texture of the scenery attributes. During construction, the Project Area would appear as a mixture of browns and grays due to earthmoving, road construction, and other construction activities.

The properties with views most affected by the Project are the residences on Clark Road north of the East Refuse Disposal Area location. The Project would change views at these residences from agricultural fields and forested areas to a 389-acre refuse disposal area with a coarse coal refuse embankment. The disposal area would resemble the appearance of the north refuse disposal area on Thompsonville Road. Road travelers would see the East Refuse Disposal Area while on the adjacent public roads. These visual impacts would be most noticed from Clark Road and North Bobtail Road. The topography of the area is generally flat with some rolling hills, but the relatively stable elevations and tree-lined drainages and site boundaries block views of the site from most other vantage points.

While the locations of the Bleeder Shaft Facilities and East Refuse Disposal Area would be reclaimed or capped with soil, respectively, at the end of their operational life; overall the adverse visual impacts are expected to occur in various portions of the Project Area over approximately 20 years. The East Refuse Disposal Area would be reclaimed or capped with soil, as described in Section 2.1.2. Reclamation of the Bleeder Shaft Facility and East Refuse Disposal Area locations would revert the industrial coal production views to a grassed area with comparable visual characteristics as the affected environment.

Due to the changing visual character of the Project Area and surrounding area, and the proposed reclamation plan, the change in viewshed from agricultural land and forested areas to industrial coal facilities is not expected to result in permanent adverse impacts.

Coal Extraction-Related Effects

Underground mining operations would generally not be heard above ground within the Shadow Area. Planned subsidence is not expected to result in noise impacts. Most of the subsidence will not be noticeable visually due to the general relief of the terrain in the Shadow Area. This terrain is hilly with forested areas and agricultural fields. Negligible

visual impacts may occur as land subsides in a controlled manner but is not expected to be noticeable or change the visual character of the Project vicinity.

Cumulative Effects

Overall, cumulative impacts have resulted in an altered visual and audial character in the vicinity of Sugar Camp Mine No. 1, but due to implementation of the IDNR-OMM-required reclamation plan, the localized noise and visual impacts are not expected to result in permanent cumulative adverse impacts. Noise impacts would continue to be avoided or mitigated, per permit requirements. Changes to the visual character of the vicinity of SBR No. 6 activities and the existing 2,420-acre surface effects area would be temporary due to implementation of the reclamation plan.

3.14 Cumulative Impacts

The CEQ regulations (40 CFR §§ 1500-1508) implementing the procedural provisions of the NEPA of 1969, as amended (42 USC § 321 et seq.) define cumulative impact 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 [RFFAs] regardless of what agency (federal or nonfederal) or person undertakes such other actions." (40 CFR §1508.7).

A cumulative impact analysis must consider the potential impact on the environment that may result from the incremental impact of a project when added to other past, present and RFFAs (40 CFR § 1508.7). Baseline conditions reflect the impacts of past and present actions. The impact analyses summarized in preceding sections are based on baseline conditions and, therefore, incorporate the cumulative impacts of past and present actions.

3.14.1 Identification of Other Actions

Past, present and reasonably foreseeable future actions (RFFAs) that are considered in this cumulative analysis focus on Sugar Camp's actions approved by IDNR under UCM Permit No. 382 SBR No. 6, which have been ongoing since 2017 and are anticipated to conclude in approximately 2040. Ongoing actions in the Sugar Camp Mine No. 1 surface effects area are also considered in this analysis. These actions began in 2008, following the issuance of the original UCM Permit No. 382, and involve the processing, storing, and transporting of coal from both privately owned and previously approved TVA-owned reserves at an existing 2,420-acre facility. Existing and RFFAs by Sugar Camp specifically considered in this analysis consist of:

- Extraction of approximately 359 million unprocessed tons of coal within the 25,847-acre private/TVA-approved shadow area;
- Planned subsidence of about 22,484 acres within the private/TVA-approved shadow area following the controlled collapse of longwall mining areas once the coal has been removed.
- Surface disturbance of about 5.3 acres for construction of bleeder shaft facilities in approximately four additional locations within the private/TVA-approved shadow area.
- Surface disturbances for mine components, including three, approximate 400-acre refuse disposal areas that would not be fully reclaimed but rather capped with soil and partially restored, per IDNR-OMM requirements.

3.14.2 Geographic Area of Analysis

The appropriate geographic area over which past, present, and RFFAs could reasonably contribute to cumulative effects is variable and dependent on the resource evaluated. Regarding the cumulative impacts analysis of air quality and greenhouse gases, the geographic area of analysis includes the UCM Permit No. 382 surface effects area and the SBR No. 6 shadow area, as well as the rest of Illinois and the United States. With respect to the cumulative impacts analysis for other resource areas, the geographic area of analysis includes the UCM Permit No. 382 surface effects area, the SBR No. 6 shadow area, and the vicinity, as relevant to the particular resource.

To address cumulative impacts, the existing affected environment surrounding the Project Area was considered in conjunction with the environmental impacts described in Chapter 3. These combined impacts are defined by CEQ as “cumulative” in 40 CFR Section 1508.7 and may include individually minor, but collectively significant actions taking place over a period of time. The potential for cumulative effects to the identified environmental resources of concern are analyzed below for the Proposed Action.

3.14.3 Cumulative Impacts by Resource

3.14.3.1 Geology and Soils

Private and TVA-approved SBR No. 6 coal mining will permanently affect geology in the SBR No. 6 permit area, given the extraction of 9.6 percent of the Herrin No. 6 coal seam. Permanent impacts to other geological resources and soils will continue to be avoided, minimized, or mitigated, per IDNR-OMM permit requirements. Temporary impacts to soils and prime farmland due to surface disturbances and planned subsidence will occur, and permanent impacts to prime farmland will occur in the locations of existing and proposed refuse disposal areas, due to these locations primarily supporting only pasture land following their partial restoration.

Cumulatively, Sugar Camp’s ongoing and proposed actions associated with the overall 37,972-acre SBR No. 6 mine expansion and the existing 2,420-acre surface effects area would result in permanent removal of approximately 14.1 percent of the Herrin No. 6 coal seam. Permanent, cumulative effects to prime farmland due to existing and proposed refuse disposal areas within the surface effects area would potentially impact approximately 3,600 acres in Franklin County. These permanent changes to farmland associated with SBR No. 6 actions would affect approximately 2.1 percent of farmland in Franklin County and approximately 0.01 percent of farmland across the state.

3.14.3.2 Water Resources

Bleeder shaft facilities associated with the private/TVA-approved shadow area will continue to be sited to avoid floodplains and Waters of the U.S. to the maximum extent practicable. Proposed siting of bleeder shaft facilities, refuse disposal areas, and other mine components in floodplains will continue to undergo the Floodplains No Practicable Alternative analysis and be minimized in order not to result in impacts to floodplains and their natural and beneficial values. Temporary impacts to surface water, wetlands, and floodplains could occur due to subsidence within the private/TVA-approved shadow area, but hydrology and drainage will be restored following subsidence to avoid permanent impacts to these water resources. Monitoring of water supply and quality within the subsided areas, per IDNR-OMM requirements, is intended to minimize impacts to groundwater, water quality, and water supply. Any decrease in water quality or quantity would be remediated by Sugar Camp. BMPs will continue to be employed to minimize the

potential for cumulative impacts to Middle Fork Big Muddy River watershed. Overall, permanent impacts to water resources associated with the mining of previously approved TVA-owned coal and privately owned coal would continue to be avoided or mitigated, per the IDNR-OMM permit requirements.

Cumulatively, significant impacts to water resources associated with the overall 37,972-acre SBR No. 6 mine expansion and actions in the existing 2,420-acre surface effects area would not occur due to implementation of the IDNR-OMM-required groundwater monitoring program, water quality sampling activities, and reclamation plan. A cumulative hydrologic impact assessment done by IDNR for the entire UCM Permit No. 382 shadow area and nearby permitted areas found that the mining operations were designed to prevent material damage to the hydrologic balance in the permit areas and surrounding vicinities.

3.14.3.3 Air Quality and Greenhouse Gases

Comparing the cumulative direct and indirect emissions of the non-GHG pollutants from the Action Alternative with other connected activities to the corresponding emissions of the same pollutants at the national level provides a reasonable proxy for assessing potential downstream air quality impacts at a regional or larger scale. The cumulative emissions were calculated by applying the same calculation methodology as was used to calculate emissions for the Action Alternative to the cumulative 14 million tons per year of processed coal produced. The cumulative direct and indirect emissions of each criteria pollutant and select HAPs as a result of continued coal mining and the downstream combustion of the extracted coal associated with the overall 37,972-acre SBR No. 6 mine expansion is estimated to be between 0.004 percent and 1.1 percent of the total US emissions of those pollutants in 2014. The cumulative emissions of GHGs from the future mining under SBR No. 6 would total about 660 million metric tons of CO_2e.

3.14.3.4 Biological Environment

Permanent impacts to biological resources associated with the mining of previously approved TVA-owned coal and privately owned coal under SBR No. 6 will continue to be avoided or mitigated, per IDNR-OMM permit requirements. Wildlife would be temporarily disturbed by surface disturbances, but displaced species would likely return with completion of reclamation activities. Temporary impacts to state-listed threatened and endangered species may occur. Coordination with USFWS on the effects of proposed mine operations and components will continue to occur. Effects to wildlife, including listed species, resulting from mining operations are subject to mitigation under Sugar Camp's integrated fish and wildlife habitat reclamation plan, per IDNR permit requirements.

Overall, no significant cumulative effects to biological resources would occur in association with the overall 37,972-acre SBR No. 6 mine expansion or the existing 2,420-acre surface effects area due to avoidance, minimization, and mitigation, per IDNR-OMM permit requirements and in compliance with the Endangered Species Act, as applicable.

3.14.3.5 Natural Areas

Minor, temporary indirect impacts to natural areas in the vicinity could occur as a result of subsidence of 33,033 acres associated with the overall 37,972-acre SBR No. 6 expansion area and temporary effects to hydrologic patterns. However, no long-term adverse impacts to natural areas are anticipated due to no direct impacts being anticipated and indirect impacts being subject to post-subsidence reclamation activities.

3.14.3.6 Land Use

Permanent impacts to land use associated with Sugar Camp's ongoing actions will continue to be avoided or mitigated, per IDNR-OMM permit requirements. Reclamation activities associated with the bleeder shaft facilities will be completed by Sugar Camp in accordance with the approved reclamation plan and the permit conditions developed in accordance with Chapter I, Illinois Administrative Code (IAC) 1817.62. Thus, effects to the locations of the bleeder shaft facilities will be minor and temporary.

Minor, permanent impacts have occurred to land use as a result of ongoing coal extraction and preparation activities. The construction of existing and proposed refuse disposal areas will continue to permanently affect agricultural uses of these locations. At the end of their operational lives, the disposal areas will be capped, and these areas will likely not be used for cultivated crops. However, these areas could likely be used as pasture following partial restoration.

Temporary, minor impacts to land use will continue to occur as a result of subsidence within the private/TVA-approved shadow area. IDNR-OMM requires coal companies to reestablish drainage patterns and stream profiles affected by mining activities. Sugar Camp will implement mitigation measures to ensure the land is returned to a condition capable of maintaining the value and reasonably foreseeable uses that the land was capable of supporting prior to subsidence.

Cumulatively, Sugar Camp's ongoing and proposed actions associated with the overall 37,972-acre SBR No. 6 mine expansion and the existing 2,420-acre surface effects area would potentially impact land use on approximately 3,600 acres in Franklin County due to construction of refuse disposal areas. These permanent changes would have minor effects, as cultivated crops are prevalent in Franklin County and throughout the state. No cumulative, long-term impacts to land use are expected as a result of the extraction of coal or associated planned subsidence of 33,033-acres associated with the overall 37,972-acre SRB No. 6 expansion area.

3.14.3.7 Transportation

Minor, temporary cumulative impacts to transportation will continue to occur as a result of Sugar Camp's ongoing actions. Rail lines have been constructed to transport coal from the existing Coal Preparation Plant, resulting in minor beneficial impacts to existing roads in the area. Some local roadways may be temporarily or permanently closed as a result of the construction and operations of proposed mine components. Any temporary damage to roads or bridges as a result of subsidence would be repaired as required by the permit.

If mine components are constructed in the private/TVA-approved shadow area at the same time as those constructed for the Proposed Action or if subsidence of different portions of the overall 37,972-acre SBR No. 6 expansion area occur simultaneously, minor, temporary cumulative effects could occur to existing roadways. Some local road closures could also occur due to the SBR No. 6 mine expansion and ongoing and proposed actions in the existing 2,420-acre surface effects area, resulting in minor, temporary or permanent cumulative effects. As required by the IDNR-OMM permitting process, Sugar Camp would continue to take measures to minimize inconvenience to the users of public roadways and obtain the necessary waivers from the authorities governing the use of those roads.

3.14.3.8 Utilities

Permanent impacts to utilities associated with Sugar Camp's ongoing actions will continue to be avoided or mitigated, per IDNR-OMM permit requirements. Sugar Camp will use existing agreements or would pursue agreements with governmental bodies and utility companies responsible for all utility services expected to be affected by subsidence. Sugar Camp will continue to compensate utilities for repair of any damage caused by mining operations.

Cumulatively, effects on utilities due to the planned subsidence of 33,033 acres associated with the overall 37,972-acre SBR No. 6 expansion area and proposed actions in the existing 2,420-acre surface effects area would be minimal and short-term due to preventive planning with governmental bodies and utility companies and subsequent repair.

3.14.3.9 Cultural Resources

As the locations of bleeder shaft facilities are identified, Sugar Camp will conduct Phase I cultural resources surveys of the potentially affected areas and provide to IHPA for consultation, as they have done for past mining activities. Sugar Camp is required to repair or compensate owners for structural damage caused by subsidence, including damage to historic properties. Impacts to historic properties that could result from subsidence would, thus, be temporary.

Cumulative effects to cultural resources in relation to the overall 37,972-acre SBR No. 6 expansion area and proposed actions in the existing 2,420-acre surface effects area, such as impacts to the viewsheds of aboveground resources, structural damage to architectural resources, or effects to NRHP-eligible archaeological sites, would be avoided, minimized, or mitigated, per IDNR-OMM requirements, and in consultation with IHPA and interested tribes.

3.14.3.10 Solid and Hazardous Waste

The existing Coal Preparation Plant is managed under an SPCC Plan for onsite bulk oil in containment, in accordance with applicable regulations. Water used at the plant will continue to be treated on-site. Existing and proposed refuse disposal areas will be capped and maintained in accordance with applicable regulations. Sugar Camp holds an NPDES permit to discharge water from 14 locations outside of the Shadow Area (Appendix B).

Cumulative impacts would be minimized by maintaining SPCC plans at all proposed coal facilities, including the bleeder shaft facilities associated with the overall 37,972-acre SBR No. 6 expansion area and facilities proposed in the existing 2,420-acre surface effects area. No cumulative impacts would occur in planned subsidence areas, as subsidence does not generate additional solid or hazardous waste.

3.14.3.11 Human Health and Safety

Previous portions of Sugar Camp Mine No. 1 and future actions related to the mine have been or will be designed and operated to comply with IDNR Mine Safety and Training Division requirements and MSHA and OSHA regulations. Thus, Sugar Camp's ongoing and proposed actions associated with the overall 37,972-acre SRR No. 6 mine expansion and the existing 2,420-acre surface effects area would not contribute to cumulative adverse impacts to human health and safety.

3.14.3.12 Socioeconomics and Environmental Justice

Economic benefits of Sugar Camp's ongoing actions include the purchase of materials, equipment, and services, and long-term increases in employment and income. These increases would be local or regional, depending on where the goods, services, and workers were obtained. Environmental justice impacts would continue to be avoided due to compliance with IDNR permit requirements to avoid, minimize, or mitigate adverse effects from mining operations. In addition, the economic benefits may have a particular benefit to low-income populations in the mine vicinity.

Overall, long-term, cumulative beneficial economic impacts would result from implementation of the Action Alternative in combination with other SBR No. 6 activities and ongoing and proposed actions in the existing 2,420-acre surface effects area. Indirect, cumulative economic effects would also occur from the expenditure of wages earned by the workforce involved in construction activities and mining operations. No cumulative adverse impacts would occur to environmental justice populations present in the mine vicinity; however, cumulative beneficial impacts may be realized.

3.14.3.13 Noise and Visual

Noise and visual impacts have occurred in the vicinity of Sugar Camp Mine No. 1 as a result of past mining actions and will continue with ongoing mining operations. Sugar Camp will likely continue to locate the bleeder shaft facilities in rural, agricultural areas, and these facilities will cause noise and visual impacts to surrounding residences and businesses. During construction, noise impacts associated with blasting for bleeder shaft facilities will continue to be avoided or mitigated, per IDNR-OMM permit requirements. Noise and visual impacts will not occur in relation to planned subsidence.

Overall, cumulative impacts have resulted in an altered visual and audial character in the vicinity of Sugar Camp Mine No. 1, but due to implementation of the IDNR-OMM-required reclamation plan, the localized noise and visual impacts in relation to the 37,972-acre SBR No. 6 mine expansion and ongoing and proposed actions in the existing 2,420-acre surface effects area are not expected to result in permanent cumulative adverse impacts.

3.15 Unavoidable Adverse Environmental Impacts

The Proposed Action could cause some unavoidable adverse environmental effects (Table 2-3.). Depending upon the exact nature of the Project effects, these resources could include cultural resources, groundwater, surface water quality, wetlands, terrestrial plants and wildlife, transportation, federally and state-listed species, and prime farmland. These effects could result from land use changes, including vegetation clearing. Some of these adverse effects could be reduced through implementing mitigation measures as described in Section 2.3.

Use of land for construction of the Bleeder Shaft Facilities could result in unavoidable impacts to prime farmland and farmland of statewide importance during operation of the mine. These temporary impacts would affect no more than 27 acres of land. The extent of the impact would depend on the acres of prime farmland in the footprint of the Bleeder Shaft Facilities and the timing of subsidence and drainage restoration activities. However, permanent impacts to prime farmland would result from the construction of the East Refuse Disposal Area. This area will no longer support cultivated crop production. In addition, the construction of the East Refuse Disposal area would also result in unavoidable adverse impacts to wetlands.

As explained in Section 3.3.2, extraction of underground coal results in the unavoidable release of methane. The transportation of the coal to the end users and the combustion of the coal by the end users would also result in the emission of substantial quantities of CO^2. The emissions of methane and CO^2, both of which are GHGs that contribute to long-term global climate changes, also constitute an unavoidable adverse effect.

Planned subsidence has the potential to cause unavoidable impacts to various resources due to changes in topography and hydrology or from direct damage to structures. Subsidence could cause changes in drainage patterns, thereby affecting wetland functions. Groundwater quantity and quality could also be impacted. However, the IDNR permit would require repair of such damages or compensation to surface landowners for these damages; therefore, these impacts would be temporary.

3.16 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses are those that generally occur on a year-to-year basis. Examples are wildlife use of forage, timber management, recreation, and human uses of water resources. Long-term productivity is the capability of the land to provide both market and nonmarket resources for future generations. In this context, long-term impacts to Project Area productivity would be those that last beyond the life of the Project.

The Proposed Action would affect short-term uses of the site of the East Refuse Disposal Area by temporarily converting land uses from agricultural and undeveloped land to industrial uses. The Proposed Action would also affect short-term uses of the 10,549-acre portion of the Shadow Area where planned subsidence would occur as well as the locations of the Bleeder Shaft Facilities. Subsidence could result in short-term losses of agricultural production in limited areas due to temporary changes in soils, topography, and drainage patterns. Following the IDNR-OMM-required reclamation and restoration activities, the productivity of the Project Area, for both humans and wildlife, would be restored with no expected long-term losses. Overall, any long-term loss of productivity would be negligible.

3.17 Irreversible and Irretrievable Commitments of Resources

An irreversible or irretrievable commitment of resources would occur when resources would be consumed, committed, or lost because of the Project. The commitment of a resource would be considered irretrievable when the Project would directly eliminate the resource, its productivity, or its utility for the life of the Project and possibly beyond. Coal extraction associated with the Project, as well as some construction and operation activities, would result in an irretrievable and irreversible commitment of natural and physical resources. The implementation of the Proposed Action would involve irreversible commitment of fuel, electric energy, and resource labor required to operate mining equipment and the Coal Preparation Plant and to construct the East Refuse Disposal Area and Bleeder Shaft Facilities represent other irreversible commitments of resources. Because of IDNR-OMM-required reclamation and restoration activities, the Project Area would not be irreversibly altered, overall, as the Project Area would be returned to IDNR-OMM approved post-mining conditions and, thus, used for pre-mining activities such as agriculture or other productive purposes with cessation of the Proposed Action.

CHAPTER 4 – LIST OF PREPARERS

4.1 NEPA Project Management

Elizabeth Smith
Position: NEPA Specialist
Education: B.A., Environmental Studies and Geography
Experience: 10 years in environmental policy and NEPA compliance
Involvement: Project Lead, NEPA Compliance, and Document Preparation

Matthew Higdon
Position: NEPA Specialist (TVA)
Education: M.S., Environmental Planning; B.A., History
Experience: 17 years in natural resource planning, environmental impact analysis, and NEPA compliance
Involvement: Co-Project Lead, NEPA Compliance, and Document Preparation

Meghan Oh
Position: Contract NEPA Specialist (HDR)
Education: M.S. and B.S., Chemistry
Experience: 15 years in environmental science, including environmental site assessments, wetland delineations and environmental permitting, watershed planning, analysis of water resources
Involvement: NEPA Compliance and Document Preparation

Charles Nicholson
Position: Sr. Environmental Scientist/Planner (HDR)
Education: PhD, Ecology and Evolutionary Biology; M.S., Wildlife Management; B.S., Wildlife and Fisheries Science
Experience: 17 years in wildlife and endangered species research and management, 24 years in NEPA compliance
Involvement: Technical Advisor and Document QA/QC

Kelly Thames, PWS
Position: Environmental Project Manager (HDR)
Education: M.S., Plant Biology; B.A., Environmental Science
Experience: 10 years in Section 404/401 regulatory permitting, ecology, biology, stream and wetland delineations, habitat evaluation and restoration, and GIS mapping
Involvement: Project Manager and Water Resources

Harriet L. Richardson Seacat
Position: Environmental Project Manager (HDR)
Education: M.A., Anthropology (Cultural); B.A., Anthropology (Native American Studies minor)
Experience: 19 years in anthropology, archaeology, history, NHPA and NEPA documentation, and project management
Involvement: Assistant Project Manager, NEPA Lead, Cultural Resources, Socioeconomics and Environmental Justice, and Cumulative Impacts

4.2 Other Contributors

Nicole Anderson
Position: Environmental Scientist (HDR)
Education: B.S., Environmental Science
Experience: 4 years in environmental science, including environmental site assessments, wetland delineations and environmental permitting, Phase I ESA, and SWPPP development
Involvement: NEPA Compliance and Document Preparation

Melissa Breyer
Position: Contract NEPA Specialist (HDR)
Education: M.S., Environmental Science; B.S., Fisheries and Wildlife
Experience: 3 years in environmental science, including environmental permitting, biological surveys and habitat assessments, wetland delineations, environmental assessments, and stormwater prevention plan development and inspection.
Involvement: GIS, NEPA Compliance, Document Preparation, and Natural Areas

Marion Kirk Dunbar
Position: Air Quality Section Manager (HDR)
Education: B.S., Aeronautical/Astronautical (Aerospace) Engineering
Experience: 29 years in air quality permitting, including stationary source permitting, greenhouse gas inventory preparation, and regulatory review and interpretation
Involvement: Air Quality and Greenhouse Gases

Mark Filardi, P.G.
Position: Sr. Environmental Scientist (HDR)
Education: M.S. and B.S., Geology
Experience: 19 years in hydrogeology, contaminated site assessment, and remediation
Involvement: Geology and Soils, Groundwater, and Solid and Hazardous Waste

Josh Fletcher, RPA
Position: Environmental Scientist/Planner (HDR)
Education: M.A., Anthropology (Archaeology); B.S., Architectural Design
Experience: 20 years in cultural resources management, regulatory compliance, NEPA documentation, and project management
Involvement: Transportation and Utilities

Ed Liebsch
Position: Sr. Air Quality Specialist (HDR)
Education: M.S., Meteorology; B.S., Earth Science with Chemistry Minor
Experience: 38 years in air dispersion analysis, 28 years in air quality permitting and NEPA air quality analysis
Involvement: Air Quality and Greenhouse Gases

Eric Mularski, PWS

Position:	Environmental Scientist (HDR)
Education:	B.S., Biology
Experience:	17 years in environmental science, including environmental site assessments, wetland delineations, environmental permitting, watershed planning, and analysis of water resources
Involvement:	Water Resources

Robert Mull

Position:	Environmental Geologist (HDR)
Education:	B.S., Geology
Experience:	4 years in environmental geology, including Phase I Environmental Site Assessments, contaminated site investigations, and geologic/hydrogeologic site characterization
Involvement:	Geology, Groundwater, and Solid and Hazardous Waste

Blair Goodman Wade, ENV SP

Position:	Sr. Environmental Planner (HDR)
Education:	M.E.M., Environmental Management; B.S., Integrated Sciences and Technology (Environmental Science and GIS)
Experience:	15 years in regulatory compliance, NEPA documentation, and mitigation planning
Involvement:	Land Use, Noise and Visual, Health and Human Safety, Socioeconomics and Environmental Justice, and Cumulative Impacts

Erica Wadl

Position:	Environmental Project Manager (HDR)
Education:	M.S., Forestry; B.S., Biology
Experience:	13 years in environmental permitting, land management, and NEPA compliance
Involvement:	Biological Environment

This page intentionally left blank.

CHAPTER 5 – DRAFT ENVIRONMENTAL IMPACT STATEMENT RECIPIENTS

5.1 Federal Agencies

U.S. Army Corps of Engineers – Louisville District, Newburgh Regulatory Field Office
U.S. Fish and Wildlife Service – Southern Illinois Sub-Office, Marion, Illinois

5.2 Federally Recognized Tribes

- Absentee Shawnee Tribe of Oklahoma
- Chippewa Cree Tribe of the Rocky Boy's Reservation
- Citizen Potawatomi Nation
- Eastern Shawnee Tribe of Oklahoma
- Forest County Potawatomi Nation
- Ho-Chunk Tribe of Wisconsin
- Kaw Nation
- Keweenaw Bay Indian Community
- Kickapoo Tribe of Kansas
- Kickapoo Tribe of Oklahoma
- Lac Vieux Desert Band of Lake Superior Chippewa Indians
- Menominee Indian Tribe of Wisconsin
- Miami Tribe of Oklahoma
- Osage Nation of Oklahoma
- Ottawa Tribe of Oklahoma
- Peoria Tribe of Indians in Oklahoma
- Pokagon Band of Potawatomi Indians
- Ponca Tribe of Nebraska
- Ponca Tribe of Oklahoma
- Prairie Band of Potawatomi Nation
- Quapaw Tribe of Oklahoma
- Red Lake Band of Chippewa Indians of Minnesota
- Sac and Fox Nation of Missouri in Kansas and Nebraska
- Sac and Fox Nation of Oklahoma
- Sac and Fox Tribe of the Mississippi in Iowa
- Shawnee Tribe
- United Keetoowah Band of Cherokee Indians
- Winnebago Tribe of Nebraska; and
- Wyandotte Nation
- United Keetoowah Band of Cherokee Indians
- Winnebago Tribe of Nebraska, and
- Wyandotte Nation.

5.3 State Agencies

Illinois Department of Natural Resources
Illinois Environmental Protection Agency
Illinois Historic Preservation Agency

5.4 Individuals and Organizations

Foresight Energy LP, St. Louis, Missouri
Sugar Camp Energy, LLC, Macedonia, Illinois

This page intentionally left blank.

CHAPTER 6 – LITERATURE CITED

Algermissen, S.T. et al. 1982. Probabilistic Estimates of Maximum Acceleration and Velocity in Rock in the Contiguous United States. United States Geological Survey. 1982.

Alliance Consulting, Inc. 2015. Comprehensive Bat Survey Demonstration, Sugar Camp Mine No. 1 and North Refuse Disposal Facility, Franklin and Hamilton Counties, Illinois. Prepared for Sugar Camp Energy, LLC, Macedonia, Illinois.

_____. 2017a. A Summer Survey for the Federally Endangered Indiana Bat (*Myotis sodalist*) and the Threatened Northern Long-eared Bat (*Myotis Septentrionalis*). Viking Shadow Area 1. Permit No. 382/ NPDES Log No. 1357-07 Near Macedonia, Franklin and Hamilton Counties, Illinois.

_____. 2017b. A Summer Survey for the Federally Endangered Indiana Bat and the Threatened Northern Long-Eared Bat, Viking Shadow Area 2, Permit No. 382/NPDES IEPA Log No. 1357-07, Near Macedonia, Franklin and Hamilton Counties, Illinois. Prepared for Sugar Camp Energy, LLC, Johnston City, Illinois.

_____. 2017c. A Summer Survey for the Federally Endangered Indiana Bat and the Threatened Northern Long-Eared Bat, Sugar Camp Shadow Area 3, Permit No. 382, Franklin and Hamilton Counties, Illinois. Prepared for Sugar Camp Energy, LLC, Johnston City, Illinois.

_____. 2017d. A Summer Survey for the Federally Endangered Indiana Bat and the Threatened Northern Long-Eared Bat, Sugar Camp Shadow Area 4, Permit No. 382/NPDES IEPA Log No. 1357-07, Near Macedonia, Franklin and Hamilton Counties, Illinois. Prepared for Sugar Camp Energy, LLC, Johnston City, Illinois.

_____. 2019a. Wetland and Stream Inventory Report, East Refuse Disposal Area, Franklin County, Illinois. Prepared for Sugar Camp Energy, LLC, Macedonia, Illinois by Alliance Consulting, Inc.

_____. 2019b. A Summer Survey for the Federally Endangered Indiana Bat and the Threatened Northern Long-Eared Bat, Sugar Camp East Refuse Disposal Area, Permit No. 382, Near Macedonia, Franklin and Hamilton Counties, Illinois. Prepared for Sugar Camp Energy, LLC, Johnston City, Illinois.

Amelon, S., and D. Burhans. 2006. Conservation assessment: *Myotis septentrionalis* (northern long-eared bat) in the Eastern United States. U.S. Department of Agriculture, Forest Service, General Technical Report NC-260: Conservation Assessments for Five Forest Bat Species in the Eastern United States.

Angel, J. 2020. Climate Change in Illinois. State Climate Office for Illinois. https://www.isws.illinois.edu/statecli/climate-change/cc.htm. Accessed 01/13/2020.

Applied Technology Council (ATC). 1978. Tentative Provisions for the Development of Seismic Regulations for Buildings, ATC-3-06 Amended, Applied Technology Council, Redwood City, California.

Booth, C.J., and E.D. Spande, 1991, *Changes in Hydraulic Properties of Strata Over Active Longwall mining, Illinois*, USA. Proceedings, Fourth International Mine Water Congress, Portschach, Austria/Lubljana, Slovenia, September, p.12

_____. 1992. "Potentiometric and Aquifer Property Changes Above Subsiding Longwall Mine Planes, Illinois Basin Coalfield." *Groundwater*, 30(3): 362-368.

California Department of Transportation (Caltrans). 2013. Technical Noise Supplement. Sacramento, CA: Division of Environmental Analysis. Available at https://dot.ca.gov/programs/environmental-analysis/noise-vibration.

Carey, Jennifer H. 1992. Quercus palustris. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available at https://www.fs.fed.us/database/feis/plants/tree/quepal/all.html.

Council on Environmental Quality (CEQ). 1997. Environmental Justice Guidance Under the National Environmental Policy Act. Available at http://www3.epa.gov/environmentaljustice/resources/policy/ej_guidance_nepa_ceq1297.pdf.

Edgin, B. and A. Mankowski. 2013. Final Recovery Planning Outline with Listing Status Review Triggers for the Illinois Threatened Storax (Styrax Americana). Approved by the Illinois Endangered Species Board at February 20, 2014 Special Meeting. Available online at: https://www.dnr.illinois.gov/ESPB/Documents/Recovery%20Docs/recovery%20planning%20outline%20styrax%20americana%20073013%20-%20Final022014.pdf.

Evans, J. B., M. G. Evans, E. R. Hajic. 1997. "Paleo-Indian and Early Archaic Occupations at the CB-North Site, Madison County, Illinois." Midcontinental Journal of Archaeology 22(2):59-196.

Franklin County Regional Economic Development Corporation (FREDCO). 2020. Mining Industry. Available at http://www.fredco.info/mining-industry.

Frankson, R., K. Kunkel, S. Champion, B. Stewart, D. Easterling, B. Hall, and J. R. Angel, 2017: Illinois State Climate Summary. NOAA Technical Report NESDIS 149-IL Available at https://statesummaries.ncics.org/chapter/il/.

HMG. 2018. Application for NEPA Boundary Review. Sugar Camp Mine, Franklin and Hamilton County, Illinois. May 2018. *Note: Information in this document was extracted or revised from the Significant Permit Revision 6 for Permit 382 Application submitted by Sugar Camp to IDNR-OMM in 2017.

Illinois Department of Agriculture (IDOA). 2018. Farmland Protection. Retrieved from https://www2.illinois.gov/sites/agr/Resources/FarmlandProtection/Pages/default.aspx#h7.

Illinois Department of Natural Resources (IDNR). 2002. "Big Muddy River Assessment Area." Volume 3: Living Resources. https://www.ideals.illinois.edu/handle/2142/13861.

_____. 2006. Floodplain Management – Local Floodplain Administrator's Manual 2006 Edition. Available at https://www.dnr.illinois.gov/WaterResources/Documents/LocalFloodplainAdministratorsManualBluebook_2006.pdf.

_____. 2008. Results of Review, Permanent Program Permit Application No. 382 Sugar Camp Energy LLC, Sugar Camp No. 1 Mine.

_____. 2010. The Illinois Barn Owl Recovery Plan. Available at https://www.dnr.illinois.gov/ESPB/Documents/IllinoisBarnOwlRecoveryPlanNovember2010.pdf.

_____. 2017. Results of Review, Permanent Program Significant Revision Application No. 6 to Permit No. 382 Sugar Camp Energy LLC, Sugar Camp Mine No. 1. Retrieved from https://www.dnr.illinois.gov/mines/LRD/PendingApplication/P382v6findings.pdf.

_____. 2018. Illinois Threatened and Endangered Species by County. https://www.dnr.illinois.gov/ESPB/Documents/ET_by_County.pdf.

Illinois Environmental Protection Agency (IEPA). 2018. 303d List of Impaired Waters. Available at https://www2.illinois.gov/epa/topics/water-quality/watershed-management/tmdls/Pages/303d-list.aspx.

Illinois General Assembly. 2020. Conservation (525 ILCS 30/1) – Illinois Natural Areas Preservation Act. P.A. 82-445. Available at http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1739&ChapterID=44.

Illinois Groundwater Protection Act (IGPA). 2014. Illinois Groundwater Protection Program Biennial Status and Self-Assessment Report. Prepared by the Interagency Coordinating Committee on Groundwater. June 2014. Available at https://www2.illinois.gov/epa/Documents/epa.state.il.us/water/groundwater/groundwater-protection/2012-2013/full-report.pdf.

Illinois Natural History Survey (INHS). 2014. Illinois Herpetology Species. http://www.inhs.illinois.edu/animals_plants/herps/ilspecies.html.

_____. 2018. Terrapene ornate (Agassiz, 1857) – Ornate Box Turtle. http://wwx.inhs.illinois.edu/collections/herps/data/ilspecies/te_ornata/.

Illinois State Geological Survey (ISGS). 1956. Circular 212, Groundwater Geology in Southern Illinois.

International Finance Corporation (IFC). 2007. Guidance Note 4: Community Health, Safety, and Security. July 31.

Iowa Environmental Mesonet (IEM). 2020. Iowa State University, Climate Data web page at http://mesonet.agron.iastate.edu/climodat/. Accessed on 01/09/2020.

Kissell, Fred. 2006. Handbook for methane control in mining. Pittsburgh Research Laboratory (National Institute for Occupational Safety and Health). Pittsburgh, PA.

Migratory Bird Treaty Act (MBTA). 16 United States Code (U.S.C.) § 703-712. 1918. Migratory Bird Treaty Act of 1918. Approved July 3, 1918. Chapter 128, § 2, 40 Statute 755. As amended on June 20, 1936, Chapter 634, 49 Statute 1556; September 8, 1960, PL 86-732, 74 Statute 866; October 17, 1968, PL 90-578, 82 Statute 1118; December 5, 1969, PL 91-135, 83 Statute 282; June 1, 1974, PL 93-300, 88 Statute 190; November 8, 1978, PL 95-616, 92 Statue 3111; November 10, 1986, PL 99-645, 100 Statute 3590; and October 30, 1998, PL 105-312, 112 Statute 2956.

Mohlenbrock, R.H., G.E. Dillard, and T.S. Abney.1961. A survey of Southern Illinois aquatic vascular plants. The Ohio Journal of Science 61(5): 262, September, 1961.

Muller, Jon. 1986. Archaeology of the Lower Ohio River Valley. Orlando, Fla.: Academic Press.

National Oceanic and Atmospheric Administration (NOAA). 2020a. Data Tools: 1981-2010 Normals. Accessed on 01/09/2020 at: https://www.ncdc.noaa.gov/cdo-web/datatools/normals.

_____. 2020b. US Tornado Climatology. Accessed on 01/09/2020 at: https://www.ncdc.noaa.gov/climate-information/extreme-events/us-tornado-climatology

NatureServe. 2019. NatureServe Explorer: An Online Encyclopedia of Life, Version 7.1. Retrieved from http://www.natureserve.org/explorer.

Nawrot, J. R., L. Kirk, and E. Elliott-Smith. 2003. “Subsidence Wetlands: An Assessment of Values.” Presented at the 2003 National Meeting of the American Society of Mining and Reclamation and the 9th Billings Land Reclamation Symposium, Billings, Montana, June 3-6, 2003. Published by American Society of Mining and Reclamation, 3134 Montavesta Rd., Lexington, KY 40502.

Nielsen, C. K. and V. L. Kelly. 2016. “Wildlife Habitat is Similar at Mined Versus Unmined Sites 30 Years Following Surface Mining for Coal in Southern Illinois.” Journal of Contemporary Water Research & Education 157: 23-32.

Norfolk Southern Railway Corp. 2011. *System-map.*pdf. Available online: https://www.nscorp.com/nscorphtml/pdf/system-map.pdf. Accessed December 12, 2019.

Olivier, J. and J. W. Peters. 2019. Trends in Global CO2 and Total Greenhouse Gas Emissions. Summary of the 2019 Report. PBL Netherlands Environmental Assessment Agency, PBL publication number 4004. Available online: https://www.pbl.nl/en/publications/trends-in-global-co2-and-totaal-greenhouse-gas-emissions-summary-of-the-2019-report. Accessed December 31, 2019.

Owili-Eger, A.A.C. 1983. Geohydrologic and Hydrogeochemical Impact of Longwall Coal Mining on Local Aquifers. Society of Mining Engineers and the American Institute of Mining, Metallurgical, and Petroleum Engineers Preprint No. 83-376:16.

Rodgers, Jr., James A. and Henry T. Smith. 2012. Little Blue Heron (Egretta caerulea), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/145/articles/introduction.

Rosgen, D.L. and H.L. Silvey. 1996. Applied River Morphology. Wildland Hydrology Books. Fort Collins, CO.

Schroder, Sissel. 2004. "Power and Place: Agency, Ecology, and History in the American Bottom, Illinois." Antiquity 78 (302):812-827.

Sparks, D. W., J. O. Whitaker Jr., and C. M. Ritzi. 2004. "Foraging Ecology of the Endangered Indiana Bat." Pages 15-27 in Proceedings of Indiana Bat & Coal Mining: A Technical Interactive Forum. Alton, Ill.: U.S. Department of the Interior, Office of Surface Mining, and Carbondale, Ill.: Coal Research Center, Southern Illinois University.

Surface Transportation Board. 2017. *Class I Railroad Annual Report R-1 to the Surface Transportation Board for the Year Ending Dec. 31, 2017*. Available online: file:///C:/Users/kdunbar/OneDrive%20-%20HDR,%20Inc/Desktop/TVA/Meghan%20Oh/Mine%20Expansion%20EIS/References/STB%202017.pdf. Accessed December 12, 2019.

Sutherland, A. B., J. L. Meyer, and E. P. Gardiner. 2002. "Effects of Land Cover on Sediment Regime and Fish Assemblage Structure in Four Southern Appalachian Streams." Freshwater Biology 47(9):1791-1805.

Tennessee Valley Authority (TVA). 1981. Class Review of Repetitive Actions in the 100-Year Floodplain, FR Vol. 46, No. 76—Tuesday, April 21, 1981. pp. 22845-22846.

_____. 2011. Approval of Illinois Coal Lease Mine Plan – Sugar Camp Mine No. 1. Environmental Assessment. Knoxville, Tennessee.

_____. 2013. Supplemental EA (SEA) Approval of Illinois Coal Lease Mine Plan – Sugar Camp Mine No. 1. Environmental Assessment. Knoxville, Tennessee.

_____. 2020. Mine Plan Approval for Illinois Coal Mineral Rights Lease, Sugar Camp Mine No. 1. Accessed February 17, 2020 at https://www.tva.com/Environment/Environmental-Stewardship/Environmental-Reviews/Mine-Plan-Approval-for-Illinois-Coal-Mineral-Rights-Lease-Sugar-Camp-Mine-No-1.

United States Army Corps of Engineers (USACE). 2016. Earthquake design and evaluation for civil works projects. Department of the Army. May 31, 2016.

United States Bureau of Economic Analysis (BEA). 2018. Employment by State. Available at https://www.bea.gov/data/employment/employment-by-state.

United States Census Bureau (USCB). 2010. Decennial Census. American Factfinder. Available at http://www.census.gov/.

_____. 2017. American Factfinder. 2013-2017 American Community Survey 5-year Estimates. Available at https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t.

_____. 2018. "Franklin and Hamilton County, Illinois." State and County QuickFacts. Available at https://www.census.gov/quickfacts/fact/table/IL,hamiltoncountyillinois,franklincountyillinois,US/PST045219.

_____. 2018. Income and Poverty in the United States: 2017. Report Number P60-263. https://www.census.gov/content/dam/Census/library/publications/2018/demo/p60-263.pdf.

United States Department of Agriculture (USDA). 2017. Census of Agriculture: 2017 State and County Profiles - Illinois. Retrieved from https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/.

_____. 2019. Farmland Protection Policy Act. Natural Resources Conservation Service, USDA. Retrieved from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/?cid=nrcs143_008275.

United States Department of Transportation (USDOT). 2015. "Construction Noise Handbook." US Department of Transportation, Federal Highway Administration. Available at https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/.

United States Energy Information Administration (USEIA). 2019. *Coal Data Browser*. Available online: https://www.eia.gov/coal/data/browser/#/shipments/mine/1103189?freq=A&start=2008&end=2018&ctype=map&ltype=pin&maptype=0&linechart=COAL.SHIPMENT_QTY.1103189-8-TOT.A&columnchart=COAL.SHIPMENT_QTY.1103189-8-TOT.A&pin=COAL.MINE.PRODUCTION.1103189-BIT-UND.A&map=COAL.SHIPMENT_QTY.1103189-8-TOT.A. Accessed December 12, 2019.

United States Environmental Protection Agency (USEPA). 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With An Adequate Margin of Safety*. March 1974. Prepared by the U.S. Environmental Protection Agency Office of Noise Abatement and Control.

_____. 1998. United States Environmental Protection Agency (USEPA). *AP-42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources*. Available online: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors#5thed. Accessed December 19, 2019.

_____. 2009. Office of Transportation and Air Quality, EPA-420-F-09-025. *Emission Factors for Locomotives*. April 2009.

_____. 2018. *Coalbed Methane Outreach Program*. Available online: https://www.epa.gov/cmop/frequent-questions. Accessed December 19, 2019.

USEPA 1998. United States Environmental Protection Agency (USEPA). *AP-42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources*. Available online: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors#5thed. Accessed December 19, 2019.

USEPA 2009. Office of Transportation and Air Quality, EPA-420-F-09-025. *Emission Factors for Locomotives*. April 2009.

USEPA 2018a. *Coalbed Methane Outreach Program*. Available online: https://www.epa.gov/cmop/frequent-questions. Accessed December 19, 2019.

USEPA 2018b. *Greenhouse Gas Reporting Program (GHGRP)*. Available online: https://www.epa.gov/ghgreporting/greenhouse-gas-reporting-program-and-us-inventory-greenhouse-gas-emissions-and-sinks. Accessed December 19, 2019.

USEPA 2018c. *GHGRP* Reported Data. Available online: https://www.epa.gov/ghgreporting/ghgrp-reported-data. Accessed December 19, 2019.

USEPA 2018d. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2017*. Available online: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2017. Accessed December 19, 2019.

USEPA 2019a. *NAAQS Table*. Available online: https://www.epa.gov/criteria-air-pollutants/naaqs-table. Accessed December 18, 2019.

USEPA 2019b. 40 CFR Part 81, Subpart C, §81.314. Available online: https://www.ecfr.gov/cgi-bin/text-idx?SID=645b96ef135eb075b7fe3b72781ba94b&mc=true&node=se40.20.81_1314&rgn=div8. Accessed December 18, 2019.

USEPA 2019c. *Air Emissions Inventories - 2017*. Available online: https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data. Accessed January 6, 2020.

USEPA 2019d. 40 CFR Part 60, Subpart Da. Available online: https://www.ecfr.gov/cgi-bin/text-idx?SID=95bc8516f58d556174835719a2bdac4d&mc=true&node=sp40.7.60.d_0a&rgn=div6#se40.7.60_143da. Accessed December 19, 2019.

USEPA 2019e. *Air Emissions Inventories - 2014*. Available online: https://www.epa.gov/air-emissions-inventories. Accessed December 19, 2019.

USEPA 2019f. *Greenhouse Gas Summary Report for 2016*. Available online: https://ghgdata.epa.gov/ghgp/service/html/2018?id=1010263&et=undefined. Accessed December 19, 2019.

United States Fish and Wildlife Service (USFWS). 1999. Indiana Bat (Myotis sodalis) Revised Recovery Plan. Fort Snelling, Minn.: U.S. Fish and Wildlife Service.

USFWS. 2011. White-Nose Syndrome: Something is Killing our Bats. Retrieved from http://www.fws.gov/whitenosesyndrome.

USFWS. 2014. National Wetlands Inventory, Wetlands Mapper Application. Available online at: http://www.fws.gov/wetlands/Data/Mapper.html.

USFWS. 2014. Endangered Species, Midwest Region, Illinois – County Distribution of Federally Threatened, Endangered and Candidate Species. Available online at: http://www.fws.gov/midwest/endangered/lists/illinois-spp.html.

USFWS, Interstate Mining Compact Commission, and Office of Surface Mining. 2014. Range-wide Indiana Bat Protection and Enhancement Plan Guidelines for Surface Coal-Mining Operations. Available online at: http://www.osmre.gov/lrg/docs/INBatPEPGuidelines.pdf.

USFWS. 2015. IPaC Species Information: Life history for northern long-eared bat (*Myotis septentrionalis*). http://ecos.fws.gov/ipac/wizard/speciesInformation!showSpeciesInformation.action?spcode=A0JE.

United States Water Resources Council. 1978. “Floodplain Management Guidelines for Implementing Executive Order 11988.” 43 Federal Register 6030 (10 February 1978).

Willman, H.B. et al., 1975, *Handbook of Illinois Stratigraphy*. Illinois State Geological Survey, Bulletin 95.

Woods, A. J., J. M. Omernik, C. L. Pederson, and B. C. Moran. 2006. Ecoregions of Illinois (poster with map, descriptive text, summary tables, and photographs): Reston, Va.: United States Geological Survey (map scale 1:1,250,000).

Wisconsin Department of Natural Resources. 2017. Barn Owl (*Tyto alba*) Species Guidance. Retrieved from https://dnr.wi.gov/files/PDF/pubs/er/ER0701.pdf.

Appendix A – Notice of Intent

in File No. 4–747, between FINRA and LTSE, filed pursuant to Rule 17d–2 under the Act, is approved and declared effective.

It is further ordered that LTSE is relieved of those responsibilities allocated to FINRA under the Plan in File No. 4–747.

For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.[18]

Jill M. Peterson,

Assistant Secretary.

[FR Doc. 2019–17208 Filed 8–9–19; 8:45 am]

BILLING CODE 8011–01–P

SECURITIES AND EXCHANGE COMMISSION

Sunshine Act Meeting; Cancellation

FEDERAL REGISTER CITATION OF PREVIOUS ANNOUNCEMENT: 84 FR 38321, August 6, 2019.

PREVIOUSLY ANNOUNCED TIME AND DATE OF THE MEETING: Thursday, August 8, 2019 at 10:00 a.m.

CHANGES IN THE MEETING: The Open Meeting scheduled for Thursday, August 8, 2019 at 10:00 a.m., has been cancelled.

CONTACT PERSON FOR MORE INFORMATION: For further information; please contact Vanessa A. Countryman from the Office of the Secretary at (202) 551–5400.

Dated: August 7, 2019.

Vanessa A. Countryman,

Secretary.

[FR Doc. 2019–17248 Filed 8–8–19; 11:15 am]

BILLING CODE 8011–01–P

SECURITIES AND EXCHANGE COMMISSION

Sunshine Act Meetings

TIME AND DATE: 2:00 p.m. on Thursday, August 15, 2019.

PLACE: The meeting will be held at the Commission's headquarters, 100 F Street NE, Washington, DC 20549.

STATUS: This meeting will be closed to the public.

MATTERS TO BE CONSIDERED: Commissioners, Counsel to the Commissioners, the Secretary to the Commission, and recording secretaries will attend the closed meeting. Certain staff members who have an interest in the matters also may be present.

In the event that the time, date, or location of this meeting changes, an announcement of the change, along with the new time, date, and/or place of the meeting will be posted on the Commission's website at *https://www.sec.gov.*

The General Counsel of the Commission, or his designee, has certified that, in his opinion, one or more of the exemptions set forth in 5 U.S.C. 552b(c)(3), (5), (6), (7), (8), 9(B) and (10) and 17 CFR 200.402(a)(3), (a)(5), (a)(6), (a)(7), (a)(8), (a)(9)(ii) and (a)(10), permit consideration of the scheduled matters at the closed meeting.

The subject matters of the closed meeting will consist of the following topics:

Institution and settlement of injunctive actions;

Institution and settlement of administrative proceedings;

Resolution of litigation claims; and

Other matters relating to enforcement proceedings.

At times, changes in Commission priorities require alterations in the scheduling of meeting agenda items that may consist of adjudicatory, examination, litigation, or regulatory matters

CONTACT PERSON FOR MORE INFORMATION: For further information; please contact Vanessa A. Countryman from the Office of the Secretary at (202) 551–5400.

Dated: August 8, 2019.

Vanessa A. Countryman,

Secretary.

[FR Doc. 2019–17353 Filed 8–8–19; 4:15 pm]

BILLING CODE 8011–01–P

TENNESSEE VALLEY AUTHORITY

Sugar Camp Energy LLC Mine Expansion (Revision 6) Environmental Impact Statement

AGENCY: Tennessee Valley Authority.

ACTION: Notice of intent.

SUMMARY: The Tennessee Valley Authority (TVA) intends to prepare an Environmental Impact Statement (EIS) on the proposed expansion of mining operations by Sugar Camp Energy, LLC to extract TVA-owned coal reserves in Hamilton and Franklin counties, Illinois. A portion of the expansion area contains coal reserves owned by TVA that are leased to Sugar Camp Energy, LLC. TVA will consider whether to approve the company's application to mine approximately 12,125 acres (''project area'') of TVA-owned coal reserves.

DATES: Comments must be received or postmarked by September 11, 2019.

ADDRESSES: Written comments should be sent to Elizabeth Smith, NEPA Specialist, Tennessee Valley Authority, 400 W Summit Hill Drive #WT11B, Knoxville, Tennessee 37902. Comments may be sent electronically to *esmith14@tva.gov.*

FOR FURTHER INFORMATION CONTACT: Elizabeth Smith, by phone at 865–632–3053, by email at *esmith14@tva.gov,* or by mail at the address above.

SUPPLEMENTARY INFORMATION: This notice is provided in accordance with the Council on Environmental Quality's regulations (40 CFR parts 1500 to 1508) and TVA's procedures for implementing the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR part 800).

Sugar Camp Energy, LLC (Sugar Camp) proposes to expand its underground longwall mining operations at its Sugar Camp Mine No. 1 in southern Illinois by approximately 37,972 acres. TVA owns coal reserves underlying approximately 12,125 acres of the Herrin No. 6 seam within the expansion area. In November 2017, Sugar Camp obtained approval for the expansion from the State of Illinois, when the Illinois Department of Natural Resources (IDNR), Office of Mines and Minerals (OMM) Land Reclamation Division (LRD) approved Significant Revision (SR) No. 6 to the company's Surface Coal Mining and Reclamation Operations Permit—Underground Operations (Number 382). TVA will consider whether to approve the company's application to mine approximately 12,125 acres (''project area'') of the TVA-owned coal reserves.

Under the proposal, surface and underground disturbance would occur. Surface activities to support the underground mining would be limited to the construction of bleeder shafts and installation of associated utilities to operate the bleeder shafts to support the extraction of TVA-owned coal. The exact location of these surface activities is unknown at this time, but they would occur within the project area. Other activities to support the underground mining of TVA-owned coal would be located outside of the project area and include operation of the coal preparation plant (approximately 3.5 miles southwest of Macedonia, Illinois).

Underground mining would be performed using two techniques. Coal would be extracted using room and pillar and continuous mining techniques during a development period, followed by longwall mining and associated planned subsidence. Subsidence would only occur under a portion of the project area. Sugar Camp would utilize its existing Mine No. 1

[18] 17 CFR 200.30–3(a)(34).

facilities to process and ship extracted coal.

Background

TVA is a federal corporation and instrumentality of the United States government, created in 1933 by an act of Congress to foster the social and economic well-being of the residents of the Tennessee Valley region. As part of its diversified energy strategy, TVA completed a series of land and coal mineral acquisitions from the 1960s through the mid-1980s that resulted in the coal ownership of two large coal reserve blocks in the southwestern section of the Illinois Basin. TVA owns coal reserves underlying approximately 65,000 acres of land containing approximately 1.35 billion tons of Illinois No. 5 and No. 6 coal seams.

TVA executed a coal lease agreement with Sugar Camp in July 2002 which allows Sugar Camp to mine the TVA coal reserves in the Illinois Basin coalfield. The purpose of this agreement is to facilitate the recovery of TVA coal resources in an environmentally sound manner. Under the terms of the agreement, Sugar Camp may not commence any mining activity pursuant to a mining plan or revisions until satisfactory completion of all environmental and cultural resource reviews by TVA required for compliance with all applicable law and regulations. Sugar Camp submitted to TVA a plan for the mining of 12,125 acres of coal reserves within the area previously approved by the State of Illinois as SBR No. 6. The EIS initiated by TVA will assess the environmental impact of approving this plan. In doing so, TVA also expects to address the cumulative impacts from the mining of the larger 37,972-acre area previously approved by the State of Illinois as SBR No. 6.

The operations of Sugar Camp Mine No. 1 have previously been subject to TVA review and approval. In 2008, Sugar Camp obtained a permit from the State of Illinois for underground longwall mining operations on approximately 12,103 acres in Franklin and Hamilton counties; the original permit did not include TVA-owned coal reserves. In 2010, Sugar Camp applied to the state for a SBR of that permit to mine TVA-owned coal under an additional 817-acre area. The permit was issued in May 2010. In 2011, TVA prepared an EA to document the potential effects of Sugar Camp's proposed mining of TVA-owned coal underneath a 2,600-acre area for Sugar Camp Mine No. 1.

In November 2017, Sugar Camp obtained approval from the IDNR to expand Sugar Camp Mine No. 1 by 37,792 acres. The Sugar Camp proposal included the expansion of operations along the north perimeter of its original mine perimeter, into a 2,250-acre area referred to as Viking District #2. In November 2018, TVA completed an EA entitled ''Sugar Camp Coal Mine Expansion Viking District #2'' which addressed expansion of mining operations into the area. In May 2019, TVA supplemented this EA to consider Sugar Camp's proposal to expand its mining into a 155-acre area within the Viking District #3, adjacent to Viking District #2.

Alternatives

TVA has initially identified two alternatives for consideration in the EIS: TVA's approval of Sugar Camp's application to mine 12,125 acres of TVA-owned coal reserves within the expansion area of Sugar Camp Mine No. 1, as approved by the State of Illinois; and the No Action Alternative. Under the action alternative, TVA proposes to assess the direct and indirect effects of the mining operations to extract TVA-owned coal reserves underlying approximately 12,125 acres within the expansion area. The mining of the remaining acreage within the 37,792-acre expansion area is not a connected action; however, TVA will address the effects of mining the remaining acreage in the cumulative impacts section of the EIS. The description and analysis of these alternatives in the EIS will inform decision makers, other agencies and the public about the potential for environmental impacts associated with the mining operations. TVA solicits comment on whether there are other alternatives that should be assessed in the EIS.

Proposed Resources and Issues To Be Considered

Public scoping is integral to the process for implementing NEPA and ensures that issues are identified early and properly studied, issues of little significance do not consume substantial time and effort, and the analysis of those issues is thorough and balanced. This EIS will identify the purpose and need of the project and will contain descriptions of the existing environmental and socioeconomic resources within the area that could be affected by mining operations. Evaluation of potential environmental impacts to these resources will include, but not be limited to, water quality, soil erosion, floodplains, aquatic and terrestrial ecology, threatened and endangered species, botany, wetlands, land use, historic and archaeological resources, as well as solid and hazardous waste, safety, socioeconomic and environmental justice issues. The final range of issues to be addressed in the environmental review will be determined, in part, from scoping comments received. TVA is particularly interested in public input on other reasonable alternatives that should be considered in the EIS. The preliminary identification of reasonable alternatives and environmental issues in this notice is not meant to be exhaustive or final.

Public Participation

The public is invited to submit comments on the scope of this EIS no later than the date identified in the **DATES** section of this notice. Federal, state and local agencies and Native American Tribes are also invited to provide comments. After consideration of comments received during the scoping period, TVA will develop and distribute a scoping document that will summarize public and agency comments that were received and identify the schedule for completing the EIS process. Following analysis of the issues, TVA will prepare a draft EIS for public review and comment; the draft EIS is scheduled for completion in late 2020. In finalizing the EIS and in making its final decision, TVA will consider the comments that it receives on the Draft EIS.

Authority: 40 CFR 1501.7.

M. Susan Smelley,

Director, Environmental Compliance and Operations.

[FR Doc. 2019–17214 Filed 8–9–19; 8:45 am]

BILLING CODE 8120–08–P

DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

Hazardous Materials: Notice of Applications for Modifications to Special Permits

AGENCY: Pipeline and Hazardous Materials Safety Administration (PHMSA), DOT.

ACTION: List of applications for modification of special permits.

SUMMARY: In accordance with the procedures governing the application for, and the processing of, special permits from the Department of Transportation's Hazardous Material Regulations, notice is hereby given that the Office of Hazardous Materials Safety has received the application described herein. Each mode of transportation for

Appendix B – Correspondence / Permits

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

BRUCE RAUNER, GOVERNOR LISA BONNETT, DIRECTOR

May 24, 2016

618/993-7200

Sugar Camp Energy, LLC
211 N. Broadway
Suite 2600
St. Louis, Missouri 63102

Re: Sugar Camp Energy, LLC
Sugar Camp Mine
NPDES Permit No. IL0078565
Final Renewed Permit

Gentlemen:

Attached is the final NPDES Permit for your discharge. The Permit as issued covers discharge limitations, monitoring, and reporting requirements. Failure to meet any portion of the Permit could result in civil and/or criminal penalties. The Illinois Environmental Protection Agency is ready and willing to assist you in interpreting any of the conditions of the Permit as they relate specifically to your discharge.

Pursuant to the Final NPDES Electronic Reporting Rule, all permittees must report DMRs electronically beginning no later than December 21, 2016. The Agency utilizes NetDMR, a web based application, which allows the submittal of electronic Discharge Monitoring Reports instead of paper Discharge Monitoring Reports (DMRs). More information regarding NetDMR can be found on the Agency website, http://epa.state.il.us/water/net-dmr/index.html. If your facility is not registered in the NetDMR program, a supply of preprinted paper DMR Forms will be sent to your facility during the interim period prior to your registration in the NetDMR program. Additional information and instructions will accompany the preprinted DMRs. Please see the attachment regarding the electronic reporting rule.

The attached Permit is effective as of the date indicated on the first page of the Permit. Until the effective date of any re-issued Permit, the limitations and conditions of the previously-issued Permit remain in full effect. You have the right to appeal any condition of the Permit to the Illinois Pollution Control Board within a 35 day period following the issuance date.

Should you have questions concerning the Permit, please contact Iwona Ward at 618/993-7200.

Sincerely,

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:IKW:cs/7233c/4-12-16

Enclosure: Final Permit

cc: IDNR/Office of Mines and Minerals/Land Reclamation/with Enclosure
IDNR/Division of Water Resources/with Enclosure
Marion Region/Mine Pollution Control Program/with Enclosure
BOW/DWPC/CAS
BOW/DWPC/Records

NPDES Permit No. IL0078565

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue, East

P.O. Box 19276

Springfield, Illinois 62794-9276

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Renewed and Modified NPDES Permit

Expiration Date: April 30, 2021

Issue Date: May 24, 2016
Effective Date: May 24, 2016

Name and Address of Permittee:

Sugar Camp Energy, L.L.C.
211 N. Broadway, Suite 2600
St. Louis, MO 63102

Facility Name and Address:

Sugar Camp Energy, L.L.C.
Sugar Camp Mine No. 1
11351 Thompsonville Road
Macedonia, Illinois 62862
8.5 miles northeast of Benton, Illinois
Franklin County

Discharge Number and Classification:		Receiving waters
001, 006, 007, 010	Alkaline Mine Drainage	Unnamed tributary to Middle Fork Big Muddy River
002, 013, 014	Alkaline Mine Drainage	Middle Fork Big Muddy River
003, 004, 008	Alkaline Mine Drainage	Unnamed tributary to Akin Creek
005	Alkaline Mine Drainage	Akin Creek
015, 016	Alkaline Mine Drainage	Unnamed tributary to Sugar Camp Creek
017	Alkaline Mine Drainage	Big Muddy River
A10	Sanitary Wastewater	Pond 010

In compliance with the provisions of the Illinois Environmental Protection Act, Subtitle C and/or Subtitle D Rules and Regulations of the Illinois Pollution Control Board, and the Clean Water Act, the above-named permittee is hereby authorized to discharge at the above location to the above-named receiving stream in accordance with the standard conditions and attachments herein.

Permittee is not authorized to discharge after the above expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Alan Keller

Alan Keller, P.E.,
Manager, Permit Section
Division of Water Pollution Control

SAK:IW:cs/7183c/3-9-16

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

From the effective date of this Permit until the expiration date, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: 001, 002, 006, 007 (Alkaline Mine Drainage)

Discharge Condition	Parameters											
	Total Suspended Solids (mg/l) ***		Iron (total) (mg/l) ***		pH** (S.U.) ***	Alkalinity/ Acidity ***	Sulfate (mg/l) ***	Chloride (mg/l) ***	Mn (total) (mg/l) ***	Hardness ***	Flow (MGD)	Settleable Solids (ml/l)
	30 day average	daily maximum	30 day average	daily maximum								
I	35	70	3.0	6.0	6.5-9.0	Alk.>Acid	1614	500	1.0	Monitor only	Measure When Sampling	-
II	-	-	-	-	6.0-9.0	-	1614	500	-	Monitor only	Measure When Sampling	0.5
III	-	-	-	-	6.0-9.0	-	1614	500	-	Monitor only	Measure When Sampling	-
IV	35	70	3.0	6.0	6.5-9.0	Alk.>Acid	1614	500	1.0	Monitor only	Measure When Sampling	-

I Dry weather discharge (base flow or mine pumpage) from the outfall.

II In accordance with 35 Ill. Adm. Code 406.110(a), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b). The 10-year, 24-hour precipitation event for this area is considered to be 4.62 inches.

III In accordance with 35 Ill. Adm. Code 406.110(d), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b).

IV Discharges continuing 24 hours after cessation of precipitation event that resulted in discharge. For outfalls which have no allowed mixing, monitoring requirements and permit limitations of Discharge Condition IV are identical to Discharge Condition I to which the outfall discharge has reverted.

Sampling during all Discharge Conditions shall be performed utilizing the grab sampling method.

*** There shall be a minimum of nine (9) samples collected during the quarter when the pond is discharging. Of these 9 samples, a minimum of one sample each month shall be taken during either Discharge Condition I or IV should such discharge condition occur. A "no flow" situation is not considered to be a sample of the discharge. In the event that Discharge Conditions II and/or III occur, grab sample of each discharge caused by the above precipitation events (Discharge Conditions II and/or III) shall be taken and analyzed for the parameters identified in the table above during at least 3 separate events each quarter. For quarters in which there are less than 3 such precipitation events resulting in discharges, a grab sample of the discharge shall be required whenever such precipitation event(s) occur(s). Should a sufficient number of discharge events occur during the quarter, the remaining three (3) quarterly samples may be taken during any of the Discharge Conditions described above.

The water quality standards for sulfate and chloride must be met in discharges from the above referenced outfall as well as in the receiving stream during all Discharge Conditions.

---

* The Permittee is subject to the limitations, monitoring, and reporting requirements of Special Condition No. 13 for the discharges from Outfalls 001, 006, 007 and the unnamed tributary to Middle Fork Big Muddy River receiving such a discharge and the discharges from Outfall No. 002 and Middle Fork Big Muddy River receiving such discharges. Also, discharges from Outfall 001 shall be subject to the limitations, monitoring, and reporting requirements of Special Condition No. 18.

** No discharge is allowed from any above referenced permitted outfall during "low flow" or "no flow" conditions in the receiving stream unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.204 for pH.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

From the effective date of this Permit until the expiration date, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: 003, 004, 005, 008 (Alkaline Mine Drainage)

Discharge Condition	Parameters											
	Total Suspended Solids (mg/l) ***		Iron (total) (mg/l) ***		pH** (S.U.) ***	Alkalinity/ Acidity ***	Sulfate (mg/l) ***	Chloride (mg/l) ***	Mn (total) (mg/l) ***	Hardness ***	Flow (MGD)	Settleable Solids (ml/l)
	30 day average	daily maximum	30 day average	daily maximum								
I	35	70	3.0	6.0	6.5-9.0	Alk.>Acid	2217	500	1.0	Monitor only	Measure When Sampling	-
II	-	-	-	-	6.0-9.0	-	2217	500	-	Monitor only	Measure When Sampling	0.5
III	-	-	-	-	6.0-9.0	-	2217	500	-	Monitor only	Measure When Sampling	-
IV	35	70	3.0	6.0	6.5-9.0	Alk.>Acid	2217	500	1.0	Monitor only	Measure When Sampling	-

I Dry weather discharge (base flow or mine pumpage) from the outfall.

II In accordance with 35 Ill. Adm. Code 406.110(a), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b). The 10-year, 24-hour precipitation event for this area is considered to be 4.62 inches.

III In accordance with 35 Ill. Adm. Code 406.110(d), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b).

IV Discharges continuing 24 hours after cessation of precipitation event that resulted in discharge. For outfalls which have no allowed mixing, monitoring requirements and permit limitations of Discharge Condition IV are identical to Discharge Condition I to which the outfall discharge has reverted.

Sampling during all Discharge Conditions shall be performed utilizing the grab sampling method.

*** There shall be a minimum of nine (9) samples collected during the quarter when the pond is discharging. Of these 9 samples, a minimum of one sample each month shall be taken during either Discharge Condition I or IV should such discharge condition occur. A "no flow" situation is not considered to be a sample of the discharge. In the event that Discharge Conditions II and/or III occur, grab sample of each discharge caused by the above precipitation events (Discharge Conditions II and/or III) shall be taken and analyzed for the parameters identified in the table above during at least 3 separate events each quarter. For quarters in which there are less than 3 such precipitation events resulting in discharges, a grab sample of the discharge shall be required whenever such precipitation event(s) occur(s). Should a sufficient number of discharge events occur during the quarter, the remaining three (3) quarterly samples may be taken during any of the Discharge Conditions described above.

The water quality standards for sulfate and chloride must be met in discharges from the above referenced outfall as well as in the receiving stream during all Discharge Conditions.

---

* The Permittee is subject to the limitations, monitoring, and reporting requirements of Special Condition No. 13 for the discharges from Outfalls 003, 004, 008 and the unnamed tributary to Akin Creek receiving such a discharges, and the discharges from Outfall No. 005 and Akin Creek receiving such discharges. Also, discharges from Outfalls 003 and 008 shall be subject to the limitations, monitoring, and reporting requirements of Special Condition No. 18.

** No discharge is allowed from any above referenced permitted outfall during "low flow" or "no flow" conditions in the receiving stream unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.204 for pH.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

From the effective date of this Permit until the expiration date, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: 010 (Alkaline Mine Drainage)

Discharge Condition	Parameters										
	Total Suspended Solids (mg/l) ***		Iron (total) (mg/l) ***		pH** (S.U.) ***	Alkalinity/ Acidity ***	Sulfate (mg/l) ***	Chloride (mg/l) ***	Hardness ***	Flow (MGD)	Settleable Solids (ml/l)
	30 day average	daily maximum	30 day average	daily maximum							
I	35	70	3.0	6.0	6.5-9.0	Alk.>Acid	1614	500	Monitor only	Measure When Sampling	-
II	-	-	-	-	6.0-9.0	-	1614	500	Monitor only	Measure When Sampling	0.5
III	-	-	-	-	6.0-9.0	-	1614	500	Monitor only	Measure When Sampling	-
IV	35	70	3.0	6.0	6.5-9.0	Alk.>Acid	1614	500	Monitor only	Measure When Sampling	-

I Dry weather discharge (base flow or mine pumpage) from the outfall.

II In accordance with 35 Ill. Adm. Code 406.110(a), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b). The 10-year, 24-hour precipitation event for this area is considered to be 4.62 inches.

III In accordance with 35 Ill. Adm. Code 406.110(d), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b).

IV Discharges continuing 24 hours after cessation of precipitation event that resulted in discharge. For outfalls which have no allowed mixing, monitoring requirements and permit limitations of Discharge Condition IV are identical to Discharge Condition I to which the outfall discharge has reverted.

Sampling during all Discharge Conditions shall be performed utilizing the grab sampling method.

*** There shall be a minimum of nine (9) samples collected during the quarter when the pond is discharging. Of these 9 samples, a minimum of one sample each month shall be taken during either Discharge Condition I or IV should such discharge condition occur. A "no flow" situation is not considered to be a sample of the discharge. In the event that Discharge Conditions II and/or III occur, grab sample of each discharge caused by the above precipitation events (Discharge Conditions II and/or III) shall be taken and analyzed for the parameters identified in the table above during at least 3 separate events each quarter. For quarters in which there are less than 3 such precipitation events resulting in discharges, a grab sample of the discharge shall be required whenever such precipitation event(s) occur(s). Should a sufficient number of discharge events occur during the quarter, the remaining three (3) quarterly samples may be taken during any of the Discharge Conditions described above.

The water quality standards for sulfate and chloride must be met in discharges from the above referenced outfall as well as in the receiving stream during all Discharge Conditions.

---

* The Permittee is subject to the limitations, monitoring, and reporting requirements of Special Condition No. 13 for the discharges from Outfall 010 and unnamed tributary to Middle Fork Big Muddy River receiving such discharges.

** No discharge is allowed from any above referenced permitted outfall during "low flow" or "no flow" conditions in the receiving stream unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.204 for pH.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

From the effective date of this Permit until the expiration date, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: 013 (Alkaline Mine Drainage)

Discharge Condition	Parameters												
	Total Suspended Solids (mg/l) ***		Iron (total) (mg/l) ***		pH** (S.U.) ***	Alkalinity/ Acidity ***	Sulfate (mg/l) ***	Chloride (mg/l) ***	Mn (total) (mg/l) ***		Hardness ***	Flow (MGD)	Settleable Solids (ml/l)
	30 day average	daily maximum	30 day average	daily maximum					30 day average	daily maximum			
I	35	70	3.0	6.0	6.5-9.0	Alk.>Acid	1614	500	2.0	4.0	Monitor only	Measure When Sampling	-
II	-	-	-	-	6.0-9.0	-	2000	See Special Condition No. 14	-	-	Monitor only	Measure When Sampling	0.5
III	-	-	-	-	6.0-9.0	-	2000	See Special Condition No. 14	-	-	Monitor only	Measure When Sampling	-
IV	35	70	3.0	6.0	6.0-9.0	Alk.>Acid	2000	See Special Condition No. 14	2.0	4.0	Monitor only	Measure When Sampling	-

I Dry weather discharge (base flow or mine pumpage) from the outfall at times of "low flow" or "no flow" conditions in the receiving stream as defined in Special Condition No. 14.

II In accordance with 35 Ill. Adm. Code 406.110(a), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b). The 10-year, 24-hour precipitation event for this area is considered to be 4.62 inches.

III In accordance with 35 Ill. Adm. Code 406.110(d), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b).

IV Discharges continuing 24 hours after cessation of precipitation event that resulted in discharge. At such time that receiving stream flow subsides, monitoring requirements and permit limitations shall revert to Discharge Condition 1.

Sampling during all Discharge Conditions shall be performed utilizing the grab sampling method.

*** There shall be a minimum of nine (9) samples collected during the quarter when the pond is discharging. Of these 9 samples, a minimum of one sample each month shall be taken during either Discharge Condition I or IV should such discharge condition occur. A "no flow" situation is not considered to be a sample of the discharge. In the event that Discharge Conditions II and/or III occur, grab sample of each discharge caused by the above precipitation events (Discharge Conditions II and/or III) shall be taken and analyzed for the parameters identified in the table above during at least 3 separate events each quarter. For quarters in which there are less than 3 such precipitation events resulting in discharges, a grab sample of the discharge shall be required whenever such precipitation event(s) occur(s). Should a sufficient number of discharge events occur during the quarter, the remaining three (3) quarterly samples may be taken during any of the Discharge Conditions described above.

Discharges from the above referenced outfall that are subject to the requirements of Discharge Conditions II, III and/or IV must meet the water quality standards for sulfate and chloride in the receiving stream during all Discharge Conditions as determined in accordance with Special Condition No. 14.

---

* The Permittee is subject to the limitations, monitoring, and reporting requirements of Special Condition No. 14 for the discharges from Outfall 013 and Middle Fork Big Muddy River receiving such discharges. Also, discharges from Outfall 013 shall be subject to the limitations, monitoring, and reporting requirements of Special Condition No. 18.

** No discharge is allowed from any above referenced permitted outfall during "low flow" or "no flow" conditions in the receiving stream unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.204 for pH.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

From the effective date of this Permit until the expiration date, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: 014 (Alkaline Mine Drainage)

Discharge Condition	Parameters												
	Total Suspended Solids (mg/l) ***		Iron (total) (mg/l) ***		pH** (S.U.) ***	Alkalinity/ Acidity ***	Sulfate (mg/l) ***	Chloride (mg/l) ***	Mn (total) (mg/l) ***		Hardness ***	Flow (MGD)	Settleable Solids (ml/l)
	30 day average	daily maximum	30 day average	daily maximum					30 day average	daily maximum			
I	35	70	3.0	6.0	6.5-9.0	Alk.>Acid	1614	500	2.0	4.0	Monitor only	Measure When Sampling	-
II	-	-	-	-	6.0-9.0	-	1614	500	-	-	Monitor only	Measure When Sampling	0.5
III	-	-	-	-	6.0-9.0	-	1614	500	-	-	Monitor only	Measure When Sampling	-
IV	35	70	3.0	6.0	6.0-9.0	Alk.>Acid	1614	500	2.0	4.0	Monitor only	Measure When Sampling	-

I Dry weather discharge (base flow or mine pumpage) from the outfall.

II In accordance with 35 Ill. Adm. Code 406.110(a), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b). The 10-year, 24-hour precipitation event for this area is considered to be 4.62 inches.

III In accordance with 35 Ill. Adm. Code 406.110(d), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b).

IV Discharges continuing 24 hours after cessation of precipitation event that resulted in discharge. For outfalls which have no allowed mixing, monitoring requirements and permit limitations of Discharge Condition IV are identical to Discharge Condition I to which the outfall discharge has reverted.

Sampling during all Discharge Conditions shall be performed utilizing the grab sampling method.

*** There shall be a minimum of nine (9) samples collected during the quarter when the pond is discharging. Of these 9 samples, a minimum of one sample each month shall be taken during either Discharge Condition I or IV should such discharge condition occur. A "no flow" situation is not considered to be a sample of the discharge. In the event that Discharge Conditions II and/or III occur, grab sample of each discharge caused by the above precipitation events (Discharge Conditions II and/or III) shall be taken and analyzed for the parameters identified in the table above during at least 3 separate events each quarter. For quarters in which there are less than 3 such precipitation events resulting in discharges, a grab sample of the discharge shall be required whenever such precipitation event(s) occur(s). Should a sufficient number of discharge events occur during the quarter, the remaining three (3) quarterly samples may be taken during any of the Discharge Conditions described above.

The water quality standards for sulfate and chloride must be met in discharges from the above referenced outfall as well as in the receiving stream during all Discharge Conditions.

---

* The Permittee is subject to the limitations, monitoring, and reporting requirements of Special Condition No. 13 for the discharges from Outfall 014 and Middle Fork Big Muddy River receiving such discharges

** No discharge is allowed from any above referenced permitted outfall during "low flow" or "no flow" conditions in the receiving stream unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.204 for pH.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

From the effective date of this Permit until the expiration date, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: 015, 016 (Alkaline Mine Drainage)

Discharge Condition	Parameters												
	Total Suspended Solids (mg/l) ***		Iron (total) (mg/l) ***		pH** (S.U.) ***	Alkalinity/ Acidity ***	Sulfate (mg/l) ***	Chloride (mg/l) ***	Mn (total) (mg/l) ***		Hardness ***	Flow (MGD)	Settleable Solids (ml/l)
	30 day average	daily maximum	30 day average	daily maximum					30 day average	daily maximum			
I	35	70	3.0	6.0	6.5-9.0	Alk.>Acid	1668	500	2.0	4.0	Monitor only	Measure When Sampling	-
II	-	-	-	-	6.0-9.0	-	1668	500	-	-	Monitor only	Measure When Sampling	0.5
III	-	-	-	-	6.0-9.0	-	1668	500	-	-	Monitor only	Measure When Sampling	-
IV	35	70	3.0	6.0	6.0-9.0	Alk.>Acid	1668	500	2.0	4.0	Monitor only	Measure When Sampling	-

I Dry weather discharge (base flow or mine pumpage) from the outfall.

II In accordance with 35 Ill. Adm. Code 406.110(a), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b). The 10-year, 24-hour precipitation event for this area is considered to be 4.62 inches.

III In accordance with 35 Ill. Adm. Code 406.110(d), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.106(b).

IV Discharges continuing 24 hours after cessation of precipitation event that resulted in discharge. For outfalls which have no allowed mixing, monitoring requirements and permit limitations of Discharge Condition IV are identical to Discharge Condition I to which the outfall discharge has reverted.

Sampling during all Discharge Conditions shall be performed utilizing the grab sampling method.

*** There shall be a minimum of nine (9) samples collected during the quarter when the pond is discharging. Of these 9 samples, a minimum of one sample each month shall be taken during either Discharge Condition I or IV should such discharge condition occur. A "no flow" situation is not considered to be a sample of the discharge. In the event that Discharge Conditions II and/or III occur, grab sample of each discharge caused by the above precipitation events (Discharge Conditions II and/or III) shall be taken and analyzed for the parameters identified in the table above during at least 3 separate events each quarter. For quarters in which there are less than 3 such precipitation events resulting in discharges, a grab sample of the discharge shall be required whenever such precipitation event(s) occur(s). Should a sufficient number of discharge events occur during the quarter, the remaining three (3) quarterly samples may be taken during any of the Discharge Conditions described above.

The water quality standards for sulfate and chloride must be met in discharges from the above referenced outfall as well as in the receiving stream during all Discharge Conditions.

---

* The Permittee is subject to the limitations, monitoring, and reporting requirements of Special Condition No. 13 for the discharges from Outfalls 015, 016 and unnamed tributary to Sugar Camp Creek receiving such discharges.

** No discharge is allowed from any above referenced permitted outfall during "low flow" or "no flow" conditions in the receiving stream unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.204 for pH.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

From the effective date of this Permit until the expiration date, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: 017* (Alkaline Mine Drainage)

Parameters											
Total Suspended Solids (mg/l)		Iron (total) (mg/l)		pH** (S.U.)	Alkalinity/ Acidity	Sulfate (mg/l)	Chloride (mg/l)	Mn (total) (mg/l)		Hardness	Flow (MGD)
30 day average	daily maximum	30 day average	daily maximum					30 day average	daily maximum		
35	70	3.0	6.0	6.5-9.0	Alk.>Acid	2000	See Special Condition No. 16	2.0	4.0	Monitor only	Measure When Sampling

All sampling shall be performed utilizing the grab sampling method.

---

* Operation and management of pumpage to Outfall 017 is subject to the requirements of Special Condition No. 16. Also, discharges from Outfall 017 shall be subject to the limitations, monitoring, and reporting requirements of Special Condition No. 18.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

From the effective date of this Permit until the expiration date, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: A10 (Sanitary Wastewater)

Parameters										
Total Suspended Solids **				BOD_5 **				pH (S.U.) **	Fecal Coliform **	Flow (MGD)
Load Limits (lbs/day)		Concentration Limits (mg/l)		Load Limits (lbs/day)		Concentration Limits (mg/l)				
30 day average	daily maximum	30 day average	daily maximum	30 day average	daily maximum	30 day average	daily maximum		daily maximum	
0.37	0.75	30	60	0.37	0.75	30	60	6.0-9.0	≤400/100 ml	Measure When Sampling

* Sample only when Outfall A10 is discharging.

** A minimum of three (3) samples per month shall be collected and analyzed for the indicated parameter; however, such sampling and analysis is required only if and/or when a discharge occurs from Outfall A10. No more than one (1) sample shall be collected during any individual monitoring event.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

Upon completion of Special Condition 10 and approval from the Agency, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: 001, 002, 006, 007, 010, 013, 014 (Reclamation Area Drainage)

Discharge Condition	Parameters					
	pH** (S.U.) ***	Sulfate (mg/l) ***	Chloride (mg/l) ***	Hardness ***	Flow (MGD)	Settleable Solids (ml/l) ***
I	6.5-9.0	1614	500	Monitor only	Measure When Sampling	0.5
II	6.0-9.0	1614	500	Monitor only	Measure When Sampling	0.5
III	6.0-9.0	1614	500	Monitor only	Measure When Sampling	-
IV	6.5-9.0	1614	500	Monitor only	Measure When Sampling	0.5

I Dry weather discharge (base flow, if present) from the outfall.

II In accordance with 35 Ill. Adm. Code 406.109(b), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations. The 10-year, 24-hour precipitation event for this area is considered to be 4.62 inches.

III In accordance with 35 Ill. Adm. Code 406.109(c), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.109(b).

IV Discharges continuing 24 hours after cessation of precipitation event that resulted in discharge. For reclamation area discharges, monitoring requirements and permit limitations of Discharge Condition IV are identical to Discharge Condition I to which the outfall discharge has reverted.

Sampling during all Discharge Conditions shall be performed utilizing the grab sampling method. A "no flow" situation is not considered to be a sample of the discharge.

*** One sample per month (1/month) shall be collected if and/or when a discharge occurs under either Discharge Condition I, II or IV and analyzed for the parameters identified in the table above. In addition, at least three (3) grab samples shall be taken each quarter from separate precipitation events under Discharge Condition III and analyzed for parameters indicated in the above table. For quarters in which there are less than 3 such precipitation events, a grab sample of the discharge shall be required whenever such precipitation event(s) occur(s).

The water quality standards for sulfate and chloride must be met in discharges from the above referenced outfall as well as in the receiving stream.

---

* The Permittee is subject to the limitations, monitoring, and reporting requirements of Special Condition No. 13, 14 and 15 for the discharges from Outfalls 001, 006, 007, 010 and the unnamed tributary to Middle Fork Big Muddy River receiving such discharges, and discharges from Outfalls 002, 013 and 014 and Middle Fork Big Muddy River receiving such discharges.

** No discharge is allowed from any above referenced permitted outfall during "low flow" or "no flow" conditions in the receiving stream unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.204 for pH.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

Upon completion of Special Condition 10 and approval from the Agency, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: 003, 004, 005, 008 (Reclamation Area Drainage)

Discharge Condition	Parameters					
	pH** (S.U.) ***	Sulfate (mg/l) ***	Chloride (mg/l) ***	Hardness ***	Flow (MGD)	Settleable Solids (ml/l) ***
I	6.5-9.0	2217	500	Monitor only	Measure When Sampling	0.5
II	6.0-9.0	2217	500	Monitor only	Measure When Sampling	0.5
III	6.0-9.0	2217	500	Monitor only	Measure When Sampling	-
IV	6.5-9.0	2217	500	Monitor only	Measure When Sampling	0.5

I Dry weather discharge (base flow, if present) from the outfall.

II In accordance with 35 Ill. Adm. Code 406.109(b), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations. The 10-year, 24-hour precipitation event for this area is considered to be 4.62 inches.

III In accordance with 35 Ill. Adm. Code 406.109(c), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.109(b).

IV Discharges continuing 24 hours after cessation of precipitation event that resulted in discharge. For reclamation area discharges, monitoring requirements and permit limitations of Discharge Condition IV are identical to Discharge Condition I to which the outfall discharge has reverted.

Sampling during all Discharge Conditions shall be performed utilizing the grab sampling method. A "no flow" situation is not considered to be a sample of the discharge.

*** One sample per month (1/month) shall be collected if and/or when a discharge occurs under either Discharge Condition I, II or IV and analyzed for the parameters identified in the table above. In addition, at least three (3) grab samples shall be taken each quarter from separate precipitation events under Discharge Condition III and analyzed for parameters indicated in the above table. For quarters in which there are less than 3 such precipitation events, a grab sample of the discharge shall be required whenever such precipitation event(s) occur(s).

The water quality standards for sulfate and chloride must be met in discharges from the above referenced outfall as well as in the receiving stream.

---

* The Permittee is subject to the limitations, monitoring, and reporting requirements of Special Condition No. 13 for the discharges from Outfalls 003, 004, 008 and unnamed tributary to Akin Creek receiving such a discharges and discharges from Outfall 005 and Akin Creek receiving such discharges.

** No discharge is allowed from any above referenced permitted outfall during "low flow" or "no flow" conditions in the receiving stream unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.204 for pH.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

Upon completion of Special Condition 10 and approval from the Agency, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfall*: 015, 016 (Reclamation Area Drainage)

Discharge Condition	Parameters					
	pH** (S.U.) ***	Sulfate (mg/l) ***	Chloride (mg/l) ***	Hardness ***	Flow (MGD)	Settleable Solids (ml/l) ***
I	6.5-9.0	1668	500	Monitor only	Measure When Sampling	0.5
II	6.0-9.0	1668	500	Monitor only	Measure When Sampling	0.5
III	6.0-9.0	1668	500	Monitor only	Measure When Sampling	-
IV	6.5-9.0	1668	500	Monitor only	Measure When Sampling	0.5

I Dry weather discharge (base flow, if present) from the outfall.

II In accordance with 35 Ill. Adm. Code 406.109(b), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations. The 10-year, 24-hour precipitation event for this area is considered to be 4.62 inches.

III In accordance with 35 Ill. Adm. Code 406.109(c), any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall comply with the indicated limitations instead of those in 35 Ill. Adm. Code 406.109(b).

IV Discharges continuing 24 hours after cessation of precipitation event that resulted in discharge. For reclamation area discharges, monitoring requirements and permit limitations of Discharge Condition IV are identical to Discharge Condition I to which the outfall discharge has reverted.

Sampling during all Discharge Conditions shall be performed utilizing the grab sampling method. A "no flow" situation is not considered to be a sample of the discharge.

*** One sample per month (1/month) shall be collected if and/or when a discharge occurs under either Discharge Condition I, II or IV and analyzed for the parameters identified in the table above. In addition, at least three (3) grab samples shall be taken each quarter from separate precipitation events under Discharge Condition III and analyzed for parameters indicated in the above table. For quarters in which there are less than 3 such precipitation events, a grab sample of the discharge shall be required whenever such precipitation event(s) occur(s).

The water quality standards for sulfate and chloride must be met in discharges from the above referenced outfall as well as in the receiving stream.

---

* The Permittee is subject to the limitations, monitoring, and reporting requirements of Special Condition No. 13 for the discharges from Outfalls 015, 016 and unnamed tributary to Sugar Camp Creek receiving such discharges.

** No discharge is allowed from any above referenced permitted outfall during "low flow" or "no flow" conditions in the receiving stream unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.204 for pH.

NPDES Coal Mine Permit

NPDES Permit No. IL0078565

Effluent Limitations and Monitoring

Upon completion of Special Condition No. 11 and approval from the Agency, the effluent of the following discharge shall be monitored and limited at all times as follows:

Outfalls: 001, 002, 003, 004, 005, 006, 007, 008, 010, 013, 014, 015, 016, (Stormwater Discharge)

Parameters	
pH* (S.U.) **	Settleable Solids (ml/l) **
6.0-9.0	0.5

Stormwater discharge monitoring is subject to the following reporting requirements:

Analysis of samples must be submitted with second quarter Discharge Monitoring Reports.

If discharges can be shown to be similar, a plan may be submitted by November 1 of each year preceding sampling to propose grouping of similar discharges and/or updated previously submitted groupings. If updating of a previously submitted plan is not necessary, a written notification to the Agency, indicating such is required. Upon approval from the Agency, one representative sample for each group may be submitted.

Annual stormwater monitoring is required for all discharges until Final SMCRA Bond is released and approval to cease such monitoring is obtained from the Agency.

---

* No discharge is allowed from any above referenced permitted outfalls during "low flow" or "no flow" conditions in the receiving stream unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.204 for pH.

** One (1) sample per year shall be collected and analyzed for the indicated parameter; however, such sampling and analysis is required only if and/or when a discharge occurs from the individual Outfall(s) identified above.

Authorization is hereby granted to the above designee to construct and operate the mine and mine refuse area described as follows:

An underground mine containing a total of 2664.31 acres, as described and depicted in IEPA Log No 5212-13, located in Sections 1, 2, 3, 4, 5, 9, 10, 11, 12, 26, 27 and 35, Township 6 South, Range 4 East, and Sections 25, 26, 27, 28, 29, 33, 34 and 35, Township 5 South, Range 4 East, Franklin County; Sections 5, 6, 7 and 8, Township 6 South, Range 5 East, Sections 30 and 31, Township 5 South, Range 5 East, and Sections 1 and 6, Township 6 South, Range 4 East, Hamilton County, Illinois. This total area is comprised of the following parcels:

Main Site
The surface facilities at the main site of this underground mine (OMM Permit No. 382) contains 1264.0 acres, included in the above cited total Permit acreage, as described and depicted in IEPA Log No. 1357-07, located in Sections 2, 3, 4, 9 and 10, Township 6 South, Range 4 East, Franklin County, Illinois. The surface facilities at this site contain an incline slope to reach the coal seam, two vertical shafts, coal preparation plant, reclaim tunnels, rail loading loop, rail loadout, parking lots, access roads, drainage control structures, office buildings, change rooms, assembly rooms, warehousing facilities, administration building, storage facilities, elevator facilities, ventilation facilities, refuse disposal areas, overland conveyors, screens, crusher, power distribution facilities, power lines, water lines, parking lots, topsoil and subsoil stockpile areas and Reverse Osmosis (RO) Water Treatment System.

Surface drainage control for the main mine site is provided by eight (8) sedimentation ponds with discharges designated as Outfalls 001, 002, 003, 004, 005, 006, 007 and 008 as discussed further below.

The following operational projects are incorporated into this permit:
As proposed and depicted in IEPA Log No. 0380-08 the freshwater lake originally design as separate impoundments identified as freshwater Pond 001 and 001A will be constructed as one large cell rather than two. The discharge structure identified as Outfall 001 will remain at the same location as previously approved.

As proposed and depicted in IEPA Log No. 0506-08 Sedimentation Basin 008 will be modified by increasing the embankment length and height to increase the normal pool elevation by approximately 11.0 feet to an elevation of 442.0 msl.

A sanitary wastewater treatment system will be constructed as described in IEPA Log No. 8562-10. The system consists of 3-1000 gallon septic tanks in series with the first two tanks equipped with effluent filters. Final treatment is provided by a buried sand filter 30'x50' in size. The treatment system was approved by the Bi-County Health Department, Marion Illinois.

As proposed in EPA Log No. 7250-11 the mining operations plan is revised to include the installation of two boreholes into the underground mining operations. First borehole will be located north of the silo within the supply yard and the second borehole located north and west of the silo also within the supply yard. These boreholes will be used to supply materials to the underground mine.

As proposed and depicted in IEPA Log. 5225-13 Underground Injection Control (UIC) deep wells will be constructed. Utilization and operation of this well shall be subject to the permitting and operations requirements of the Agency approval from the Bureau of Land for the UIC Well.

As previously approved under Subtitle D Permit No. 2014-MA-4185 two Reverse Osmosis (RO) Plants were constructed at Sugar Camp Mine main site area. As described in IEPA Log Nos 4185-14, 4185-14-A and 4470-14, a 2,400 to 3,000 GPM permanent RO Water Treatment System will be utilized to treat the high-chloride water being pumped from the underground mine workings, existing refuse disposal area and/or surface ponds. This system consists of two (2) buildings each designated to treat approximately 1,200 to 1,500 GPM of water per system. The permanent RO system was installed as proposed and depicted on the Plot Plan Layout, System P&ID (Piping & Instrumentation diagram) and Sugar Camp Flow Diagram contained in IEPA Log No. 4185-14. Prior to the high chloride water entering the RO system, such water may go through any or all of the following partial list of filtration and/or treatment facilities or processes:

1. Feed water may initially be pumped into a 10,000 gallon contact tank at which point 12.5% Sodium Hypochlorite is added.

2. A pH control and coagulant may be added to the water exiting the contact tank prior to being directed to six (6) 12-foot diameter multi-media filters following which the filtered water will be stored in a 10,000 gallon Filtered Water Tank.

3. Water pumped from the Filtered Water Tank will be treated with an Antiscalant and Sodium Bisulfate prior to entry into the RO No. 1 system. Reject from the RO No. 1 system will be stored in a 10,000 gallon Intermediate Storage Tank.

4. The initial reject water from the Intermediate Storage Tank will be pumped to the second side, or stage, of the RO No. 1 system with the concentrate from this second (2^{nd}) stage, as well as any excess backwash water, being pumped to the refuse disposal area (RDA).

5. The RO No. 2 system will be operated in a manner similar to that described above for the RO No. 1 system.

6. Permeate (clean water) from both RO No. 1 and RO No. 2 may be directed to Sedimentation Basin 001 with the water in this basin used as make-up water for the preparation plant.

North Refuse Disposal Area
As previously approved under Subtitle D Permit No. 2015-MA-3259, North Refuse Disposal Area was constructed north from Sugar Camp Mine Site. As described and depicted in IEPA Log No. 3259-15 topsoil removal, grading, foundation preparation and installation of four (4) foot compacted clay liner was developed. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

Sugar Camp Mine – North Refuse Facility for an underground coal mine, located immediately north of the main site, also identified as OMM Permit No. 434 area, contains of a total of 1,159.42 acres, as described and depicted in IEPA Log Nos. 4544-14, 4544-14-C and 3350-15. The area, which is included in the above cited total permit acreage is located in Sections 28, 29 and 33, Township 5 South, Range 4 East and Sections 4 and 5, Range 6 South, Township 4 East, Franklin County, Illinois. The surface facilities at this refuse disposal area contains haulroads/transportation facilities, conveyor belt, drainage control structures, sedimentation ponds, fine and coarse coal refuse disposal area, topsoil and subsoil stockpile areas. Construction of this disposal area as proposed is subject to Condition No. 12.

Surface drainage control for the new North Refuse Disposal Area will be provided by four sedimentation ponds with discharges designated as Outfalls 013, 014, 015 and 016 as discussed further below.

NW Portal
A satellite surface facilities permit area identified as Sugar Camp Mine NW Portal, (OMM Permit No. 382), previously approved under NPDES Permit No. IL0079472 is hereby incorporated into this NPDES Permit.

Surface facilities in support of an underground mine containing a total of 19.8 acres, included in the above cited total Permit acreage, as described and depicted in IEPA Log Nos. 8389-10 and 8389-10-A, located in Sections 28, Township 5 South, Range 4 East, Franklin County, Illinois. These surface facilities, in support of the underground mine, contains the intake shaft with man elevator, parking lots, access roads, drainage control structures, bath house, change rooms, topsoil and subsoil stockpile areas, shaft excavation stockpile, shaft construction drill pit, sediment pond and wastewater treatment system. As described and depicted in the IEPA Log No. 5150-13 additional structures supporting underground mine are proposed for this facility. This facility is not approved for coal stockpiling or coal refuse disposal.

Surface drainage control for this area is provided by one (1) sedimentation pond with discharge designated as Outfall 010, classified as alkaline mine drainage as discussed further below.

Discharge from the sanitary wastewater treatment system, identified as Outfall A10, will be tributary to Pond 010 via Ditch 010-B.

Mixing Zone (Big Muddy River)
Excess water will be transported from the Sugar Camp Complex to Outfall 017 on the Big Muddy River through a high-density polyethylene (HDPE) pipeline. Water will be pumped from the water holding cell by pumps through approximately 13.8 miles of pipe to the diffuser located at the mixing zone location. The pipeline ROW will be approximately 50 feet in width with a total permitted area of approximately 84 acres.

During the operations of the pipeline, continuous flow monitors will be installed to provide protection against leakage. Flow will be monitored near the pump discharge while the pipeline is within the sediment control structures of Sugar Camp Complex. Flow will also be monitored at the mixing zone location. This instrumentation will be connected to an alarm system and flow data will be transmitted to a central location for tracking and assessing system operations. The flow monitoring system operation and maintenance is subject to the requirements of Condition No. 16.

Drainage control at the Sugar Camp Mine
Surface drainage control is provided by fourteen (14) sedimentation ponds and one (1) sanitary wastewater discharge with discharges designated as Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 010, A10, 013, 014, 015, 016 and 017 all classified as alkaline mine drainage.

Discharge from the sanitary wastewater treatment system, identified as Outfall A10, will be tributary to Pond 010 via Ditch 010-B.

Location and receiving stream of the Outfalls at this facility is as follows:

Outfall	Latitude			Longitude			
Number	DEG	MIN	SEC	DEG	MIN	SEC	Receiving Waters
001	38°	01'	55"	88°	46'	00"	Unnamed tributary to Middle Fork Big Muddy River
002	38°	01'	52"	88°	46'	43"	Middle Fork Big Muddy River
003	38°	01'	32"	88°	46'	44"	Unnamed tributary to Akin Creek
004	38°	01'	32"	88°	45'	36"	Unnamed tributary to Akin Creek
005	38°	01'	07"	88°	45'	29"	Akin Creek
006	38°	02'	10"	88°	45	36"	Unnamed tributary to Middle Fork Big Muddy River
007	38°	02'	09"	88°	45'	38"	Unnamed tributary to Middle Fork Big Muddy River
008	38°	01'	29"	88°	45'	18"	Unnamed tributary to Akin Creek
010	37°	41'	17"	89°	58'	58"	Unnamed tributary to Middle Fork Big Muddy River
A10	37°	41'	19"	89°	58'	55"	Pond 010
013	38°	02'	17"	88°	46'	13"	Middle Fork, Big Muddy River
014	38°	03'	07"	88°	45'	39"	Middle Fork, Big Muddy River
015	38°	03'	09"	88°	46'	37"	Unnamed tributary to Sugar Camp Creek
016	38°	03'	11"	88°	46'	52"	Unnamed tributary to Sugar Camp Creek
017	38°	01'	8.85"	88°	57'	56.79"	The Big Muddy River

Compacted clay liners as described below for the refuse disposal area shall also be constructed for Sedimentation Basins 001, 003, 004, 013, 014, 015 and 016 which receive pumpage and/or runoff from coal stockpiles and/or coal refuse disposal activities. Construction of the four (4) foot compacted clay liners for the sedimentation basins shall also be subject to and in accordance with the specifications and testing requirements of Condition No. 12.

Refuse disposal:
Coarse and fine coal refuse disposal shall be performed at Sugar Camp Mine facilities as proposed and described in IEPA Log Nos. 1357-07 and 1357-07-B. Foundation preparation for the coarse refuse disposal areas and the fine coal refuse areas (RDA No. 1) shall consist of the construction of a four (4) foot compacted clay liner subject to and in accordance with Condition No. 12. Construction, development and utilization of Slurry Cell No. 1 is subject to Condition No. 14.

As proposed and described in IEPA Log Nos. 7245-11 (Revision No. 1 to OMM Permit No. 382), the coarse refuse embankment originally proposed as non-impounding structure will be enclosed to develop an impounding structure for slurry disposal. A four foot clay liner will be constructed, which eliminates the need for the keyway, which has been eliminated from the design under IEPA Log No. 7245-11-B. The coarse refuse embankment will be constructed in three phases. Phases 1, 2 and 3 will be constructed with top elevations of approximately 445 feet, 470 feet and 480 feet above msl, respectively

As proposed and depicted in IEPA Log Nos. 4112-14, 4112-14-A and 4112-14-B, the top elevation of the embankment of refuse disposal area No. 1 will be raised to a total height of approximately 86 feet to a final crest elevation of 496.0 feet (phase V).

As previously approved under Subtitle D Permit No. 2014-MW-4357, a non-impounding coarse refuse disposal area was developed and operated at Sugar Camp Mine main site area. As described in IEPA Log Nos 4357-14 and 4357-14-B an expansion to the northwest of the existing Refuse Disposal Area (RDA) No. 1 embankment was developed. Development of this area for the refuse disposal included construction of a low permeability liner consisting of four (4) foot compacted clay with a hydraulic conductivity of $1x10^{-7}$ cm/sec., or less. Compacted clay liner shall also be subject to and in accordance with the specifications and testing requirements of Condition No. 12.

IBR Areas and pump installation:
As proposed and depicted in IEPA Log No. 7165-11, an additional area of 0.6 acres located in Section 1, Township 6 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for construction of access road, installation of borehole to transport concrete into the underground mine and soil storage areas. This area was later modified under IEPA Log No. 7550-11 (see discussion below) to enlarge the area by 0.4 acres and to install turbine Pump No. 3. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 7550-11, an additional area of 8.72 acres located in Sections 1, 10, 11 and 12 Township 6 South, Range 4 East, Franklin County and Section 6, Township 6 South, Range 5 East, Hamilton County is incorporated into the NPDES Permit. This area includes 0.52 acres identified as turbine pump site 1, an additional 0.04 acres added to turbine pump site 3 (Log No. 7165-11, see discussion above), and a water pipeline corridor consisting of 7.54 acres to connect turbine pump site Nos. 1, 2, 3 and 4 with the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 5037-13, an additional area of 1.4 acres located in Section 1, Township 6 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for construction of access roads work area and two-16" boreholes. A pump will be set in each of the boreholes with pumpage being directed to the main pipeline which conveys underground mine pumpage to the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 5064-13, an additional area of 0.7 acres located in Section 1, Township 6 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for construction of a single 16" borehole. A pump will be set in this borehole with pumpage being directed to the main pipeline which conveys underground mine pumpage to the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 5222-13, an additional area of 5.2 acres located in Sections 30 and 31, Township 5 South, Range 5 East, Hamilton County is incorporated into the NPDES Permit for construction of a buried 12" waterline from the number two bleeder shaft to the main pipeline which conveys underground mine pumpage to the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 5479-13, an additional area of 3.2 acres located in Sections 1 and 12, Township 6 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for installation of two boreholes. A pump will be set in each borehole with pumpage being directed to the main pipeline which conveys underground mine pumpage to the main mine site. Activity within this area will include improving an existing access road. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log Nos. 4015-14 and 4015-14-A, an additional area of 7.1 acres located in Sections 26, 27 and 35, Township 6 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for construction of six boreholes, improvement of access roads, installation of ventilation fan and small structure to enclose air-compressor. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 4129-14, an additional area of 2.0 acres located in Section 11, Township 6 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for construction of four boreholes and access roads. Pumps will be installed in two of the boreholes with pumpage directed to the pipeline which conveys underground pumpage to the main mine site. The remaining two boreholes will be utilized to provide electrical service and aggregate/concrete to the underground mining operations. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 4130-14, an additional area of 3.4 acres located in Section 12, Township 6 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for construction of three boreholes and access roads. A pump will be installed in one of the boreholes with pumpage directed to the pipeline which conveys underground pumpage to the main mine site. The remaining two boreholes will be utilized to provide compressed air and aggregate/concrete to the underground mining operations. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 4147-14, an additional area of 10.2 acres located in Sections 27 and 34, Township 5 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for installation of a buried waterline to convey underground pumpage from the Viking Portal (NW Portal) to the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 4236-14, an additional area of 0.5 acres located in Section 10, Township 6 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for construction of four boreholes and two concrete pads. Two service boreholes will provide essential power and compress air to the underground operations. A pump will be installed in one of the boreholes with pumpage directed to the pipeline which conveys underground pumpage to the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 4285-14, an additional area of 5.0 acres located in Section 30, Township 5 South, Range 5 East, Hamilton County is incorporated into the NPDES Permit for installation of turbine pump borehole to maintain underground safety conditions. A buried waterline convey underground pumpage to the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 4320-14, an additional area of 14.28 acres located in Section 4, Township 6 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for the new topsoil stockpile storage area. Runoff from the area approved herein will be controlled by diversion ditches 002-A, 002-B and 002-C reporting to basin 002.

As proposed and depicted in IEPA Log No. 4340-14, an additional area of 6.3 acres located in Sections 25 and 26, Township 5 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for installation of vertical turbine pump and installation of a combination compressed air/electrical power supply. A buried waterline will be installed to convey underground pumpage to the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 4488-14, an additional area of 0.9 acres located in Section 7, Township 6 South, Range 5 East, Hamilton County is incorporated into the NPDES Permit for installation of vertical turbine pump to pump water from the underground workings. A buried waterline convey underground pumpage to the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 4510-14, an additional area of 3.0 acres located in Section 7, Township 6 South, Range 5 East, Hamilton County is incorporated into the NPDES Permit for construction of an access road, installation of vertical turbine pumps to pump water from the underground workings to maintain required underground mine ventilation and safety conditions. A buried waterline convey underground pumpage to the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log Nos. 3140-15 and 3140-15-A, an additional area of 3.9 acres located in Section 35, Township 5 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for construction of a belt air fan/borehole to add capacity of fresh air to underground workings area. Combination of power and communication borehole to add utilities for underground workings will be also constructed. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As proposed and depicted in IEPA Log No. 2031-16, an additional area of 4.7 acres located in Section 36, Township 5 South, Range 4 East, Franklin County is incorporated into the NPDES Permit for construction of two boreholes for installation of a vertical turbine pumps to pump water from the underground workings to maintain required underground mine ventilation and safety conditions. A buried waterline convey underground pumpage to the main mine site. Runoff from the area approved herein will be controlled by silt fence, mulching, seeding, vegetation, rock check dams, erosion control blankets, etc.

As previously approved under Subtitle D Permits, an additional 55.91 acres of permit area is incorporated into this permit and described as follows:

Main site

A non-contiguous area as described in IEPA Log No. 6166-12 (OMM Permit No. 382) consisting of 1.9 acres, located in Section 6, Township 6 South, Range 4 East, Hamilton County, to be used for construction of the vertical turbine pump in a mine service borehole, a small laydown area and an access road. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 4199-14 (OMM Permit No. 382) consisting of 1.5 acres, located in Section 25, Township 5 South, Range 4 East, Franklin County, to be utilized for the construction of a borehole to provide compressed air to underground working area. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 3343-15 (OMM Permit No. 382) consisting of 6.3 acres, located in Section 8, Township 6 South, Range 5 East, Hamilton County, to be utilized for the construction of a bleeder shaft for additional fresh air to the underground ventilation passages. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 7321-11 (OMM Permit No. 382) consisting of 0.71 acres, located in Section 2, Township 6 South, Range 4 East, Franklin County, to be utilized for the construction of the emergency concrete borehole to transport concrete into the mine and access road. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 7551-11 (OMM Permit No. 382) consisting of 1.4 acres, located in Section 1, Township 6 South, Range 4 East, Franklin County, to be utilized for the construction of the compressed air borehole facility to supply high pressure air to run under ground water pumps for underground water management control. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 6085-12 (OMM Permit No. 382) consisting of 0.1 acres, located in Section 1, Township 6 South, Range 4 East, Franklin County, to be utilized for the construction of buried waterline. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 6137-12 (OMM Permit No. 382) consisting of 0.9 acres, located in Section 5, Township 6 South, Range 5 East, Hamilton County, to be utilized for the construction of the two vertical turbine pumps in two mine service boreholes, a rock dust bin, pad and borehole, a small laydown area and an access road. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 6236-12 (OMM Permit No. 382) consisting of 1.5 acres, located in Section 5, Township 6 South, Range 5 East, Hamilton County, to be utilized for the construction of the Pumpable Concrete Crib Borehole Facility, which consists of two mine service boreholes (concrete and compressed air), a surface structure, a rock dust borehole, bin and concrete pad, a laydown area and a road entrance. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 4148-14 (OMM Permit No. 382) consisting of 0.5 acres, located in Section 30, Township 5 South, Range 5 East, Hamilton County, to be utilized for the construction of concrete mine service boreholes. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 6157-12 (OMM Permit No. 382) consisting of 0.8 acres, located in Section 6, Township 6 South, Range 5 East, Hamilton County, to be utilized for the construction of the two vertical turbine pumps in two mine service boreholes, a small laydown area and an access road. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 6300-12 (OMM Permit No. 382) consisting of 2.7 acres, located in Section 6, Township 6 South, Range 5 East, Hamilton County, to be utilized for the construction of two boreholes, install two vertical turbine pumps, construct a small open work yard and bury a waterline. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 6428-12 (OMM Permit No. 382) consisting of 16.5 acres, located in Sections 30 and 31, Township 5 South, Range 5 East, Hamilton County, to be utilized for the construction of the air-shaft, topsoil and subsoil storage areas and access road. Boring activities and air-shaft construction will require the excavation and development of a non-discharging cuttings pond as depicted in the referenced project. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 6469-12 (OMM Permit No. 382) consisting of 3.7 acres, located in Section 1, Township 6 South, Range 4 East, Franklin County, to be utilized for the construction of two mine service boreholes, two vertical pumps, two water lines and an access road. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 6606-12 (OMM Permit No. 382) consisting of 1.7 acres, located in Section 33, Township 5 South, Range 4 East, Franklin County, to be utilized for the construction of a concrete borehole structure to protect the air compressor, improve an existing road entrance and construct an access road. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 5024-13 (OMM Permit No. 382) consisting of 1.6 acres, located in Section 1, Township 6 South, Range 4 East, Franklin County, to be utilized for the construction of concrete mine service borehole and access road. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 5126-13 (OMM Permit No. 382) consisting of 0.8 acres, located in Section 10, Township 6 South, Range 4 East, Franklin County, to be utilized for the construction of the two mine service boreholes to deliver compressed air and concrete to the underground works, access road and open work area. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 5131-13 (OMM Permit No. 382) consisting of 1.4 acres, located in Section 10, Township 6 South, Range 4 East, Franklin County, to be utilized for the construction of a mine ventilation drill hole and access road. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 5295-13 (OMM Permit No. 382) consisting of 0.4 acres, located in Section 11, Township 6 South, Range 4 East, Franklin County, to be utilized for the construction of concrete mine service boreholes and access road. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

A non-contiguous area as described in IEPA Log No. 2030-16 (OMM Permit No. 382) consisting of 1.2 acres, located in Section 33, Township 5 South, Range 4 East, Franklin County, to be utilized for the construction of a borehole to provide compressed air to underground working area. Alternate drainage control will be provided by the use of silt fence, straw bale dikes, graveled areas and re-vegetation. Runoff from the corridor areas will be monitored in accordance with stormwater monitoring requirements.

Groundwater monitoring for the main facility will consist of Monitoring Well Nos. GW-1 through GW-12, as depicted in IEPA Log No. 1357-07-B. Well Nos. GW-9, GW-10, GW-11 and GW-12 will monitor effects of the initial refuse disposal area. Groundwater monitoring requirements are outlined in Condition No. 15.

Groundwater monitoring for the North Refuse Disposal facility will consist of nine (9) new Monitoring Wells Nos. MW-31, MW-32, MW-33, MW-34, MW-35, MW-36, MW-37, MW-38 and MW-38R will monitor effects of the initial refuse disposal area. Groundwater monitoring requirements are outlined in Condition No. 15.

This Construction Authorization replaces Construction Authorization Nos. 1357-07 and 8389-10.

The abandonment plan shall be executed and completed in accordance with 35 Ill. Adm. Code 405.109.

All water remaining upon abandonment must meet the requirements of 35 Ill. Adm. Code 406.202. For the constituents not covered by 35 Ill. Adm. Code Parts 302 or 303, all water remaining upon abandonment must meet the requirements of 35 Ill. Adm. Code 406.106.

NPDES Permit No. IL 0078565

Construction Authorization No.5212-13

This Authorization is issued subject to the following Conditions. If such Conditions require additional or revised facilities, satisfactory engineering plan documents must be submitted to this Agency for review and approval to secure issuance of a Supplemental Authorization to Construct.

1. If any statement or representation is found to be incorrect, this permit may be revoked and the permittee thereupon waives all rights thereunder.

2. The issuance of this permit (a) shall not be considered as in any manner affecting the title of the premises upon which the mine or mine refuse area is to be located; (b) does not release the permittee from any liability for damage to person or property caused by or resulting from the installation, maintenance or operation of the proposed facilities; (c) does not take into consideration the structural stability of any units or parts of the project; and (d) does not release the permittee from compliance with other applicable statutes of the State of Illinois, or with applicable local laws, regulations or ordinances.

3. Final plans, specifications, application and supporting documents as submitted by the person indicated on Page 1 as approved shall constitute part of this permit in the records of the Agency.

4. There shall be no deviations from the approved plans and specifications unless revised plans, specifications and application shall first have been submitted to the Agency and a supplemental permit issued.

5. The permit holder shall notify the Agency (217/782-3637) immediately of an emergency at the mine or mine refuse area which causes or threatens to cause a sudden discharge of contaminants into the waters of Illinois and shall immediately undertake necessary corrective measures as required by 35 Ill. Adm. Code 405.111. (217/782-3637 for calls between the hours of 5:00 p.m. to 8:30 a.m. and on weekends.)

6. The termination of an NPDES discharge monitoring point or cessation of monitoring of an NPDES discharge is not authorized by this Agency until the permittee submits adequate justification to show what alternate treatment is provided or that untreated drainage will meet applicable effluent and water quality standards.

7. Initial construction activities in areas to be disturbed shall be for collection and treatment facilities only. Prior to the start of other activities, surface drainage controls shall be constructed and operated to avoid violations of the Act or Subtitle D. At such time as runoff water is collected in the sedimentation pond, a sample shall be collected and analyzed, for the parameters designated as 1M through 15M under Part 5-C of Form 2C and the effluent parameters designated herein with the results sent to this Agency. Should additional treatment be necessary to meet the standards of 35 Ill. Adm. Code 406.106 or applicable water quality standards, a Supplemental Permit must be obtained. Discharge from ponds is not allowed unless applicable effluent and water quality standards are met in the basin discharge(s).

8. This Agency must be informed in writing and an application submitted if drainage, which was previously classified as alkaline (pH greater than 6.0), becomes acid (pH less than 6.0) or ferruginous (base flow with an iron concentration greater than 10 mg/l). The type of drainage discharging to the basin should be reclassified in a manner consistent with the applicable provisions of 35 Ill. Adm. Code Part 406. The application should discuss the treatment method and demonstrate how the discharge will meet the applicable standards.

9. A permittee has the obligation to add a settling aid if necessary to meet the suspended solids or settleable solids effluent standards. The selection of a settling aid and the application practice shall be in accordance with a. or b. below

   a. Alum ($Al_2(SO_4)_3$), hydrated lime ($Ca(OH)_2$), soda ash (Na_2CO_3), alkaline pit pumpage, acetylene production by-product (tested for impurities), and ground limestone are acceptable settling aids and are hereby permitted for alkaline mine drainage sedimentation ponds.

   b. Any other settling aids such as commercial flocculents and coagulants are permitted only on prior approval from the Agency. To obtain approval a permittee must demonstrate in writing to the Agency that such use will not cause a violation of the toxic substances standard of 35 Ill. Adm. Code 302.210 or of the appropriate effluent and water quality standards of 35 Ill. Adm. Code parts 302, 304, and 406.

10. A general plan for the nature and disposition of all liquids used to drill boreholes shall be filed with this Agency prior to any such operation. This plan should be filed at such time that the operator becomes aware of the need to drill unless the plan of operation was contained in a previously approved application.

11. Any of the following shall be a violation of the provisions required under 35 Ill. Adm. Code 406.202:

    a. It is demonstrated that an adverse effect on the environment in and around the receiving stream has occurred or is likely to occur.

    b. It is demonstrated that the discharge has adversely affected or is likely to adversely affect any public water supply.

    c. The Agency determines that the permittee is not utilizing Good Mining Practices in accordance with 35 Ill. Adm. Code 406.204 which are fully described in detail in Sections 406.205, 406.206, 406.207 and 406.208 in order to minimize the discharge of total dissolved solids, chloride, sulfate, iron and manganese. To the extent practical, such Good Mining Practices shall be implemented to:

        i. Stop or minimize water from coming into contact with disturbed areas through the use of diversions and/or runoff controls (Section 406.205).

        ii. Retention and control within the site of waters exposed to disturbed materials utilizing erosion controls, sedimentation controls, water reuse or recirculation, minimization of exposure to disturbed materials, etc. (Section 406.206).

        iii. Control and treatment of waters discharged from the site by regulation of flow of discharges and/or routing of discharges to more suitable discharge locations (Section 406.207).

        iv. Utilized unconventional practices to prevent the production or discharge of waters containing elevated contaminant concentrations such as diversion of groundwater prior to entry into a surface or underground mine, dewatering practices to remove clean water prior to contacting disturbed materials and/or any additional practices demonstrated to be effective in reducing contaminant levels in discharges (Section 406.208).

    d. The Agency determines that the permittee is not utilizing Best Management Practices associated with coal refuse disposal activities in order to minimize the discharge of total dissolved solids, chloride, sulfate, iron and manganese. As stated in IEPA Log No. 1357-07-G, the Best Management Practices to be implemented are:

        Coarse Refuse Disposal:

        i. Maximization of the distribution of un-oxidized coarse refuse so as to minimize the exposure to oxidation and weathering.

        ii. Concurrent compaction of coarse refuse; placement of material lifts, grading and compaction of disposed materials including side slopes.

        iii. Minimization of long term end dumped storage of loose coarse refuse.

        iv. Alkaline amendment of coarse refuse as, or if, necessary for permitted water quality standard compliance, including the use of agricultural lime or other similarly alkaline materials so as to achieve a NNP in excess of 10 tons per 1000 tons of material.

        v. Oxidation management as part of the final reclamation process to enhance coarse refuse alkalinity.

        Fine Refuse (Slurry) Disposal:

        i. Maintenance of adequate water depth over fine refuse to maximize retention time and differential separation of slurried material.

        ii. Sequential movement of slurry input point to assure better distribution of material.

        iii. As part of the final reclamation process, incremental limestone amendment over the appropriate time period to evaluate soil cover alternatives, if necessary.

12. The four (4) foot compacted clay liner to be constructed beneath the coarse refuse disposal area, fine coal refuse area (Slurry Cell No. 1 and North Refuse Disposal Area), and Sedimentation Basins 001, 003, 004, and 013 shall be subject to the following specifications and procedures as detailed in IEPA Log Nos. 1357-07-B and 4544-14.

Construction Specifications

a. All soils to be used for compacted clay liner shall be free of grass, vines, vegetation, and rock or stones greater than 4 inches in diameter.

b. Each location at which a compacted clay liner is to be constructed shall be excavated to the proposed base elevation and then over-excavated an additional three (3) feet. One (1) foot of the resulting base material shall be scarified and re-compacted to achieve the minimum permeability requirements cited below.

c. Each successive soil lift shall be placed to a 6 to 8 inch loose thickness; however, in no instance shall the loose lift thickness exceed the length of the pads or feet on the compactor or roller.

d. Each soil lift shall be compacted to the minimum Standard Proctor (ASTM D698) density identified in Item no. 12(q) below, at a moisture content of 0% to 5% above the optimum moisture content of the soil.

e. Inter-lift surfaces shall be adequately scarified to ensure inter-lift bonding.

f. Liner construction shall be performed to ensure consistent achievement of density, moisture content, and hydraulic conductivity for each successive lift.

g. The placement of frozen material or the placement of material on frozen ground shall be prohibited.

h. Contemporaneous placement or protective covering shall be provided to prevent drying, desiccation and/or freezing where necessary.

i. Liner construction shall be completed in a manner which reduces void spaces within the soil and liner.

j. All construction stakes shall be removed during construction, and all test holes (Shelby tube samples) are to be backfilled with bentonite.

k. The compacted clay liner shall be constructed in a manner to achieve a uniform barrier with a hydraulic conductivity of $1X10^{-7}$ cm/sec.

l. In the event that acceptable compaction results are not achieved, the soil lift shall be re-processed or removed and replaced. If moisture content is less than optimum, or greater than 5% above optimum, the failing material shall be wetted or dried to a moisture content within specification and re-compacted. If the dry density is below specification, the failing material shall be re-compacted until a passing test is achieved.

m. In the event of a failing conductivity test, the soil may be removed or re-compacted and retested until a passing result is obtained; or the soil immediately above and below the test specimen from the same Shelby tube may be tested. If both tests pass, the original test shall be nullified. If either test fails, that portion of the liner shall be rejected and shall be reconstructed and retested until passing results are obtained. The limits of necessary reconstruction shall be determined by additional sampling and testing within the failed region, thereby isolating the failing area of work.

Testing Specifications

n. Prior to initiating soil liner construction, borrow soils shall be identified, qualified, and verified. At a minimum, a representative sample of each soil type identified within the borrow area is to be collected and analyzed for gradation, compaction, and hydraulic conductivity characteristics.

o. Samples collected from the borrow area shall be evaluated in accordance with ASTM D422, D4318 and D2487 to ensure classification criteria are met.

p. Samples collected from the borrow area shall be tested in accordance with ASTM D698 to determine maximum dry density and optimum moisture content of the soil.

q. Samples collected from the borrow area shall be compacted to 90% and 95% standard Proctor density at or near optimum moisture content. The hydraulic conductivity of the re-compacted samples shall be determined in accordance with ASTM D5084 procedures. The results of this testing shall be used to establish the minimum dry density for soil liner compaction necessary to achieve a hydraulic conductivity of $1X10^{-7}$ cm/sec or less.

r. Moisture and density testing by nuclear methods (ASTM D2922 and D3017) shall be conducted at a rate of at least one test per 1,000 cubic yards placed. Testing locations shall be random, and shall not be known to the earthwork contractor prior to lift placement.

s. To ensure the accuracy and reproducibility of the nuclear testing, all nuclear density gauges shall be certified to calibration. Soil compaction tests shall be double-checked with independent test methods. A drive cylinder test and laboratory moisture content determination shall be conducted and compared to gauge readings. These independent checks shall be made at the outset of construction and on a bi-weekly basis (e.g., every ten working days) thereafter.

t. Samples for hydraulic conductivity verification shall be retrieved from the compacted soil liner and tested in accordance with ASTM D5084 procedures. Samples shall be retrieved using three-inch Shelby tubes. Samples shall be completed at a frequency of one sample/test per 20,000 cubic yards placed. The vertical location of the recovered samples shall be varied so that representative portions or lifts of the constructed liner are tested. Testing locations shall be random, and shall not be known to the earthwork contractor prior to soil liner construction.

u. Survey checks shall be conducted at a maximum spacing of 100 ft. centers, and at 100 ft. intervals along each line where a break in slope occurs, to verify liner thickness. To verify liner thickness, the survey checks shall be taken before and after liner construction.

13. Synthetic (geo-membrane) liners proposed to be installed beneath any future facility at this mine site shall be subject to the following specifications and procedures:

Site preparation

a. Subgrade material below geo-membrane liner shall consist of structural fill and/or in-situ soils.

b. The subgrade shall be inspected and cleared of any potentially deleterious materials.

c. Subgrade material will consist of relatively homogeneous, fine-grained soils and be free of debris, vegetation, frozen materials, foreign objects and organics. The subgrade surface shall be solid, uniform and smooth.

Liner material and placement

d. The synthetic liner will consist of a High Density Polyethylene (HDPE) Geo-membrane and will be installed directly above the subgrade soils.

e. The HDPE Geo-membrane shall be installed in accordance with manufacturer's requirements.

f. A 12-ounce per square yard non-woven geotextile cushion will be placed above the HDPE liner to prevent puncture during protective cover placement.

Protective cover

g. A protective cover component will be placed directly above the liner system and will consist of a minimum thickness of 12 inches of homogeneous fine grained soils (clays and silts) and coarse grained sands. This cover material shall be free of debris, vegetation, frozen materials, foreign objects and organics.

14. RDA No. 1 shall be constructed as proposed in IEPA Log Nos. 1357-07, 1357-07-B, 7245-11, 7245-11-B, 4112-14, 4112-14A, 4112-14-B and 4164-14. The fine coal refuse (slurry) disposal area located within the coarse refuse embankment of Refuse Disposal Area (RDA) No. 1 and North Refuse Disposal Area shall be operated as a closed circuit system in conjunction with the preparation plant and RO system.

15. Groundwater monitoring requirements for the OMM Permit No. 382 area as approved under IEPA Log Nos. 1357-07 and 1357-07-B and groundwater monitoring requirements for the OMM Permit No. 434 as approved under IEPA Log Nos. 4544-14 and 4544-14-D are as follows:

a. Groundwater monitoring shall consist of Well Nos. GW-1 through GW-12 and Well Nos. MW-31, MW-32, MW-33, MW-34, MW-35, MW-36, MW-37, MW-38 and MW-38R.

b. Ambient background monitoring shall be performed for all referenced wells. Such ambient monitoring shall consist of six (6) samples collected during the first year (approximately bi-monthly) following well installation but no later than during the first year of operation or disturbance to determine ambient background concentrations. Background monitoring shall include the following list of constituents:

Aluminum	Fluoride	Sulfate
Antimony	Iron (dissolved)	Thallium
Arsenic	Iron (total)	Total Dissolved Solids
Barium	Lead	Vanadium
Beryllium	Manganese (dissolved)	Zinc
Boron	Manganese (total)	pH
Cadmium	Mercury	Acidity
Chloride	Molybdenum	Alkalinity
Chromium	Nickel	Hardness
Cobalt	Phenols	Static Water Elevation
Copper	Selenium	
Cyanide	Silver	

c. Following the ambient monitoring as required under Condition No. 15(b) above, routine monitoring shall continue on a quarterly basis as follows:

i. Monitoring Well Nos. GW-9, GW-10, GW-11, GW-12, MW-31, MW-32, MW-33, MW-34, MW-35, MW-36, MW-37, MW-38 and MW-38R associated with refuse disposal shall continue to be monitored quarterly for the contaminates identified in 15(b) above.

ii. Monitoring Well Nos. GW-1, GW-2, GW-3, GW-4, GW-5, GW-6, GW-7 and GW-8 shall be monitored quarterly as required by IDNR/OMM for the following list of constituents:

Iron (dissolved)	Hardness
Iron (total)	Acidity
Manganese (dissolved)	Alkalinity
Manganese (total)	pH
Sulfate	Water Elevation
Total Dissolved Solids	

d. Following completion of active mining and reclamation, post-mining monitoring of all above referenced wells shall consist of six (6) samples collected during a 12-month period (approximately bi-monthly) to determine post-mining concentrations. Post-mining monitoring shall include the list of constituents identified in Condition No. 15(b) above.

e. Groundwater monitoring reports shall be submitted to the Agency in accordance with Special Condition Nos. 3 and 5 of this NPDES permit.

Should electronic filing of groundwater monitoring data through IDNR/OMM be elected, electronic notification shall be provided to the Agency upon submittal of groundwater data to IDNR/OMM.

f. A statistically valid representation of background and/or post mining water quality required under Condition No. 15(b) and 15(d) above shall be submitted utilizing the following method. This method shall be used to determine the upper 95 percent confidence limit for each parameter listed above.

Should the Permittee determine that an alternate statistical method would be more appropriate based on the data being evaluated, the Permittee may request utilization of such alternate methodology. Upon approval from the Agency, the alternate methodology may be utilized to determine a statistically valid representation of background and/or post mining water quality.

The following method should be used to predict the confidence limit when single groundwater samples are taken from each monitoring (test) well.

i. Determine the arithmetic mean $\left(\overline{X}_b\right)$ of each indicator parameter for the sampling period. If more than one well is used, an equal number of samples must be taken from each well.

$$\overline{X}_b = \frac{X_1 + X_2 + \ldots X_n}{n}$$

Where:

$\overline{X}_b$ = Average value for a given chemical parameter

X_n = Values for each sample

n = the number of samples taken

ii. Calculate the background and/or post mining variance (S_b^2) and standard deviation (S_b) for each parameter using the values (X_n) from each sample of the well(s) as follows:

$$S_b^2 = \frac{(X_1 - \overline{X}_b)^2 + (X_2 - \overline{X}_b)^2 + \ldots + (X_n - \overline{X}_b)^2}{n-1}$$

$$S_b = \sqrt{S_b^2}$$

iii. Calculate the upper confidence limit using the following formula:

$$CL = \overline{X}_b \pm t\sqrt{1 + 1/n}\ \ (S_b)$$

Where:

CL = upper confidence limit prediction
(upper and lower limits should be calculated for pH)
t = one-tailed t value at the required significance
level and at n-1 degrees of freedom from Table 1
(a two-tailed t value should be used for pH)

iv. If the values of any routine parameter for any monitoring well exceed the upper confidence limit for that parameter, the permittee shall conclude that a statistically significant change has occurred at that well.

v. When some of the background and/or post mining values are less than the Method Detection Limit (MDL), a value of one-half (1/2) the MDL shall be substituted for each value that is reported as less than the MDL. All other computations shall be calculated as given above.

If all the background and/or post mining values are less than the MDL for a given parameter, the Practical Quantitation Limit (PQL), as given in 35 Ill. Adm. Code Part 724 Appendix I shall be used to evaluate data from monitoring wells. If the analytical results from any monitoring well exceed two (2) times the PQL for any single parameter, or if they exceed the PQLs for two or more parameters, the permittee shall conclude that a statistically significant change has occurred.

Table 1
Standard t-Tables Level of Significance

Degrees of freedom	t-values (one-tail)		t-values (two-tail)*	
	99%	95%	99%	95%
4	3.747	2.132	4.604	2.776
5	3.365	2.015	4.032	2.571
6	3.143	1.943	3.707	2.447
7	2.998	1.895	3.499	2.365
8	2.896	1.860	3.355	2.306
9	2.821	1.833	3.250	2.262
10	2.764	1.812	3.169	2.228
11	2.718	1.796	3.106	2.201
12	2.681	1.782	3.055	2.179
13	2.650	1.771	3.012	2.160
14	2.624	1.761	2.977	2.145
15	2.602	1.753	2.947	2.131
16	2.583	1.746	2.921	2.120
17	2.567	1.740	2.898	2.110
18	2.552	1.734	2.878	2.101
19	2.539	1.729	2.861	2.093
20	2.528	1.725	2.845	2.086
21	2.518	1.721	2.831	2.080
22	2.508	1.717	2.819	2.074
23	2.500	1.714	2.807	2.069
24	2.492	1.711	2.797	2.064
25	2.485	1.708	2.787	2.060
30	2.457	1.697	2.750	2.042
40	2.423	1.684	2.704	2.021

Adopted from Table III of "Statistical Tables for Biological Agricultural and Medical Research" (1947, R.A. Fisher and F. Yates).

* For pH only when required.

16. System performance and operation will be continuously monitored with instrumentation designed to provide warning of potential problems. The entire system is to be inspected weekly when operating. Any items of concern noted from system inspections are to be addressed immediately and, if necessary, pumping operations are to be suspended until the issue is resolved.

17. The following additional sediment and erosion control measures shall be implemented at this facility:

    a. Establish and maintain vegetative cover in areas currently cropland.
    b. Soil stockpiles will be seeded with grasses and/or legumes to minimize exposure to excessive water and wind erosion.
    c. Organic mulch or chemical binders will be used as required by IDNR on the side slopes of the stockpiles.
    d. Seeding with small grain or grass cover and applying straw mulch will be used where practicable and the installation of sediment basin will be used as a means of controlling suspended solids from exposed areas where topsoil has been removed.
    e. Final vegetation will be established on all disturbed areas.
    f. Disturbed areas will be seeded and mulched to provide a vegetative cover to prevent erosion.
    g. During construction, sediment control measures such as silt fences, straw bale dikes, riprap check dams and mulching will be used to minimize erosion and prevent sediment from leaving the permit area.
    h. All construction areas will be stabilized with permanent vegetative species, graded stone and/or paving material.

NPDES Permit No. IL0078565

Special Conditions

Special Condition No. 1: No effluent from any mine related facility area under this permit shall, alone or in combination with other sources, cause a violation of any applicable water quality standard as set out in the Illinois Pollution Control Board Rules and Regulations, Subtitle C: Water Pollution.

Special Condition No. 2: Samples taken in compliance with the effluent monitoring requirements shall be taken at a point representative of the discharge, but prior to entry into the receiving stream.

Special Condition No. 3: All periodic monitoring and reporting forms, including Discharge Monitoring Report (DMR) forms, shall be submitted to the Agency according to the schedule outlined in Special Condition No. 4 or 5 below with one (1) copy forwarded to each of the following addresses:

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Ave., East
P.O. Box 19276
Springfield, IL 62794-9276

Illinois Environmental Protection Agency
Mine Pollution Control Program
2309 West Main Street, Suite 116
Marion, Illinois 62959

Attn: Compliance Assurance Section

The Permittee will be required to submit electronic DMRs (NetDMRs) instead of mailing paper DMRs to the IEPA beginning December 21, 2016. More information, including registration information for the NetDMR program, can be obtained on the IEPA website, http://www.epa.state.il.us/water/net-dmr/index.html.

Special Condition No. 4: Completed Discharge Monitoring Report (DMR) forms and as well as upstream and downstream monitoring results, shall be retained by the Permittee for a period of three (3) months and shall be mailed and received by the IEPA at the addresses indicated in Special Condition No. 3 above in accordance with the following schedule, unless otherwise specified by the permitting authority.

Period	Received by IEPA
January, February, March	April 15
April, May, June	July 15
July, August, September	October 15
October, November, December	January 15

The Permittee shall record discharge monitoring results on Discharge Monitoring Report (DMR) forms using one such form for each Outfall and Discharge Condition each month. In the event that an Outfall does not discharge during a monthly reporting period or under a given Discharge Condition, the DMR form shall be submitted with "No Discharge" indicated.

Any and all monitoring results, other than NPDES outfall discharge results reported through NetDMR, shall be submitted to the Agency at the addresses indicated in Special Condition No. 3 above.

Special Condition No. 5: Completed periodic monitoring and reporting, other than DMR's and stream monitoring (i.e., groundwater monitoring, coal combustion waste analysis reports, etc.), shall be retained by the Permittee for a period of three (3) months and shall be mailed and received by the IEPA at the addresses indicated in Special Condition No. 3 above in accordance with the following schedule, unless otherwise specified by the permitting authority.

Period	Received by IEPA
January, February, March	May 1
April, May, June	August 1
July, August, September	November 1
October, November, December	February 1

Special Condition No. 6: The Agency may revise or modify the permit consistent with applicable laws, regulations or judicial orders.

Special Condition No. 7: If an applicable effluent standard or limitation is promulgated under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act and that effluent standard or limitation is more stringent than any effluent limitation in the permit or controls a pollutant not limited in the NPDES Permit, the Agency shall revise or modify the permit in accordance with the more stringent standard or prohibition and shall so notify the permittee.

Special Conditions

Special Condition No. 8: The permittee shall notify the Agency in writing by certified mail within thirty days of abandonment, cessation, or suspension of active mining for thirty days or more unless caused by a labor dispute. During cessation or suspension of active mining, whether caused by a labor dispute or not, the permittee shall provide whatever interim impoundment, drainage diversion, and wastewater treatment is necessary to avoid violations of the Act or Subtitle D Regulations.

Special Condition No. 9: Plans must be submitted to and approved by this Agency prior to construction of any future sedimentation ponds. At such time as runoff water is collected in the sedimentation pond, a sample shall be collected and analyzed for the parameters designated as 1M-15M under Part 5-C of Form 2C and the effluent parameters designated herein with the results sent to this Agency. Should additional treatment be necessary to meet these standards, a Supplemental Permit must also be obtained. Discharge from a pond is not allowed unless applicable effluent and water quality standards are met.

Special Condition No. 10: The special reclamation area effluent standards of 35 Ill. Adm. Code 406.109 apply only on approval from the Agency. To obtain approval, a request form and supporting documentation shall be submitted to request the discharge be classified as a reclamation area discharge. The Agency will notify the permittee upon approval of the change.

Special Condition No. 11: The special stormwater effluent standards apply only on approval from the Agency. To obtain approval, a request with supporting documentation shall be submitted to request the discharge to be classified as a stormwater discharge. The documentation supporting the request shall include analysis results indicating the discharge will consistently comply with reclamation area discharge effluent standards. The Agency will notify the permittee upon approval of the change.

Special Condition No. 12: Annual stormwater monitoring is required for all discharges not tributary to a sediment basin until Final SMCRA Bond is released and approval to cease such monitoring is obtained from the Agency.

a. Each discharge must be monitored for pH and settleable solids annually.

b. Analysis of samples must be submitted with second quarter Discharge Monitoring Reports. A map with discharge locations must be included in this submittal.

c. If discharges can be shown to be similar, a plan may be submitted by November 1 of each year preceding sampling to propose grouping of similar discharges and/or update previously submitted groupings. If updating of a previously submitted plan is not necessary, a written notification to the Agency indicating such is required. Upon approval from the Agency, one representative sample for each group may be submitted.

Special Condition No. 13: Sediment Pond Operation and Maintenance (Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 010, 014, 015 and 016).

a. At times of stormwater discharge, in addition to the alternate effluent monitoring requirements, discharges from Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 010, 014, 015 and 016 shall be monitored and reported for Discharge Rate, Sulfate, Chloride and Hardness.

b. The following sampling and monitoring requirements are applicable to flow in the Middle Fork Big Muddy River which receives discharges from Outfalls 002 and 014, the unnamed tributaries to Middle Fork Big Muddy River receiving the discharges from Outfalls 001, 006, 007 and 010, Akin Creek which receives discharges from Outfall 005, the unnamed tributaries to Akin Creek receiving the discharge from Outfalls 003, 004 and 008 and unnamed tributaries to Sugar Camp Creek which receives discharges from Outfalls 015 and 016.

    i. All sampling and monitoring required in accordance with 13(b)(ii) and (iii) below shall be performed during a discharge and monitoring event from the associated outfall.

    ii. The Middle Fork Big Muddy River, Akin Creek and Sugar Camp Creek as well as the unnamed tributaries to these receiving streams shall be monitored and reported quarterly for Discharge Rate, Chloride, Sulfate and Hardness downstream of the associated outfalls, if applicable. This downstream monitoring shall be performed a sufficient distance downstream of the associated outfall to ensure that complete mixing has occurred. At such time that sufficient information has been collected regarding receiving stream flow characteristics and in-stream contaminant concentrations, the permittee may request a re-evaluation of the monitoring frequency required herein for possible reduction or elimination. For the purpose of re-evaluating the downstream monitoring frequency of the receiving stream, "sufficient information" is defined as a minimum of ten (10) quarterly sampling events.

    In the event that downstream monitoring of the receiving waters is eliminated during the term of this permit based on an evaluation of the quarterly data, a minimum of three (3) additional samples analyzed for the parameters identified above must be submitted with the permit renewal application a minimum of 180 days prior to expiration of this permit.

iii. The Middle Fork Big Muddy River, Akin Creek and Sugar Camp Creek as well as the unnamed tributaries to these receiving streams shall be monitored and reported annually for Discharge Rate, Chloride, Sulfate and Hardness upstream of the associated outfall.

Special Condition No. 14: Sediment Pond Operation and Maintenance (Outfall 013):

a. No discharge is allowed from Outfall No. 013 during "low flow" or "no flow" conditions in the receiving stream, unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.

Pursuant to 35 Ill. Adm. Code Part 302.102, discharges from the referenced outfalls that otherwise would not meet the water quality standards of 35 Ill. Adm. Code Part 302 may be permitted if sufficient flow exists in the receiving stream to ensure that applicable water quality standards are met. That is, discharges not meeting the water quality standards of 35 Ill. Adm. Code Part 302 may only be discharged in combination with stormwater discharges from the basin, and only at such times that sufficient flow exists in the receiving stream to ensure that water quality standards in the receiving stream beyond the area of allowed mixing will not be exceeded.

The permittee shall determine the effluent limitation for chloride and/or the maximum effluent flow rate allowable to maintain water quality in the receiving stream. The following equations shall be used to make such determinations:

$$C_{DS} = [C_E Q_E + 0.25 C_{US} Q_{US}]/ (0.25 Q_{US} + Q_E)$$

Where:

C_E = Effluent concentration (mg/L)

Q_E = Effluent flow rate (cfs) for Outfall 013

Q_{US} = Upstream flow rate (cfs)

C_{US} = Upstream concentration (mg/L)

C_{DS} = Downstream concentration

The "calculated" downstream concentration shall be less than 500 mg/L for chloride and reported on the discharge monitoring reports (DMRs).

The permittee shall install a gauging station and TDS monitor upstream of the discharge to determine an upstream flow (Q_{US}) and a chloride concentration (C_{US}) correlated to the TDS value. In addition, the permittee shall install a continuous TDS monitor downstream to ensure that the chloride concentration (correlated to the TDS value) stays within the chloride water quality standard.

b. The following sampling and monitoring requirements are applicable to flow in Middle Fork Big Muddy River which receives the discharges from Outfall 013.

i. All sampling and monitoring required under 14(b)(ii) and (iii) below shall be performed during a discharge and monitoring event from the associated outfall.

ii. Middle Fork Big Muddy River shall be monitored and reported quarterly for Discharge Rate, Sulfate, Chloride and Hardness downstream of the associated outfall. This downstream monitoring shall be performed a sufficient distance downstream of the associated outfall to ensure that complete mixing has occurred. At such time that sufficient information has been collected regarding stream flow characteristics and in-stream contaminant concentrations, the permittee may request a re-evaluation of the monitoring frequency required herein for possible reduction or elimination. For the purpose of re-evaluating the downstream monitoring frequency of the receiving stream, "sufficient information" is defined as a minimum of ten (10) quarterly sampling events.

In the event that downstream monitoring of the receiving waters is eliminated during the term of this permit based on an evaluation of the quarterly data, a minimum of three (3) additional samples analyzed for the parameters identified above must be submitted with the permit renewal application a minimum of 180 days prior to expiration of this permit.

iii. Middle Fork Big Muddy River shall be monitored and reported annually for Discharge Rate, Sulfate, Chloride and Hardness upstream of the associated outfall.

Special Conditions

Special Condition No. 15: Sediment Pond Operation and Maintenance (Outfall 013 – Reclamation Area Discharge Classification):

a. For discharges resulting from precipitation events, in addition to the alternate effluent (Discharge Condition Nos. II and III) monitoring requirements, as indicated on the applicable effluent pages of this Permit, discharges from Outfall 013 shall be monitored and reported for Discharge Rate, Sulfate, Chloride and Hardness.

b. The following sampling and monitoring requirements are applicable to flow in the Middle Fork Big Muddy River which receive discharges from Outfall 013.

   i. All sampling and monitoring required under 15(b)(ii) and (iii) below shall be performed during a discharge and monitoring event from the associated outfall.

   ii. Middle Fork Big Muddy River shall be monitored and reported quarterly for Discharge Rate, Chloride, Sulfate and Hardness downstream of the associated outfall. This downstream monitoring shall be performed a sufficient distance downstream of the associated outfall to ensure that complete mixing has occurred. At such time that sufficient information has been collected regarding receiving stream flow characteristics and in-stream contaminant concentrations the permittee may request a re-evaluation of the monitoring frequency required herein for possible reduction or elimination. For the purpose of re-evaluating the downstream monitoring frequency of the receiving stream, "sufficient information" is defined as a minimum of ten (10) quarterly sampling events.

   In the event that downstream monitoring of the receiving waters is eliminated during the term of this permit based on an evaluation of the quarterly data, a minimum of three (3) additional samples analyzed for the parameters identified above must be submitted with the permit renewal application a minimum of 180 days prior to expiration of this permit.

   iii. Middle Fork Big Muddy River shall be monitored and reported annually for Discharge Rate, Chloride, Sulfate and Hardness upstream of the associated outfall.

Special Condition No. 16: Sediment Pond Operation and Maintenance (Outfall 017):

a. No discharge is allowed from Outfall No. 017 during "low flow" or "no flow" conditions in the receiving stream, unless such discharge meets the water quality standards of 35 Ill. Adm. Code 302.

   Pursuant to 35 Ill. Adm. Code Part 302.102, discharges from the referenced outfalls that otherwise would not meet the water quality standards of 35 Ill. Adm. Code Part 302 may be permitted if sufficient flow exists in the receiving stream to ensure that applicable water quality standards are met. That is, discharges not meeting the water quality standards of 35 Ill. Adm. Code Part 302 may only be discharged in combination with stormwater discharges from the basin, and only at such times that sufficient flow exists in the receiving stream to ensure that water quality standards in the receiving stream beyond the area of allowed mixing will not be exceeded.

   The permittee shall determine the effluent limitation for chloride and/or the maximum effluent flow rate allowable to maintain water quality in the receiving stream. The following equations shall be used to make such determinations:

   $$C_{DS} = [C_E Q_E + 0.25 C_{US} Q_{US}] / (0.25 Q_{US} + Q_E)$$

   Where:

   C_E = Effluent concentration (mg/L)

   Q_E = Effluent flow rate (cfs) for Outfall 017

   Q_{US} = Upstream flow rate (cfs)

   C_{US} = Upstream concentration (mg/L)

   C_{DS} = Downstream concentration

The "calculated" downstream concentration shall be less than 500 mg/L for chloride and reported on the discharge monitoring reports (DMRs).

Chloride is limited in the NPDES permit at the limits described below. The maximum flow from Outfall 017 is 8,482 gpm and the maximum chloride concentration is 12,000 mg/L.

Special Conditions

The permit only allows a discharge when the Big Muddy River is flowing above 30 cfs. The maximum dispersion required for all water quality parameters is 25.5:1. Model predictions have been made for a maximum effluent total flow rate of 18.9 cfs. At the maximum chloride concentration of 12,000 mg/L, this maximum discharge requires a river flow of 1,893 cfs to meet a dispersion of 25.5 mg/L in less than 25 % of the river volume. The maximum distance to meet the water quality standard for all scenarios is 221.5 feet downstream with a plume width of 13.1 feet.

The upstream flow (Q_{US}) should be based on the US Army Corps of Engineers (USACE) dam at Rend Lake and the chloride concentration can be based on the 90^{th} percentile of the existing data of 30.1 mg/L.

b. The following sampling and monitoring requirements are applicable to flow in Big Muddy River which receives the discharges from Outfall 017.

   i. All sampling and monitoring required under 16(b)(ii) and (iii) below shall be performed during a discharge and monitoring event from the associated outfall.

   ii. The Big Muddy River shall be monitored and reported quarterly for Discharge Rate, Sulfate, Chloride and Hardness downstream of the associated outfall. This downstream monitoring shall be performed a sufficient distance downstream of the associated outfall to ensure that complete mixing has occurred. At such time that sufficient information has been collected regarding stream flow characteristics and in-stream contaminant concentrations, the permittee may request a re-evaluation of the monitoring frequency required herein for possible reduction or elimination. For the purpose of re-evaluating the downstream monitoring frequency of the receiving stream, "sufficient information" is defined as a minimum of ten (10) quarterly sampling events.

   In the event that downstream monitoring of the receiving waters is eliminated during the term of this permit based on an evaluation of the quarterly data, a minimum of three (3) additional samples analyzed for the parameters identified above must be submitted with the permit renewal application a minimum of 180 days prior to expiration of this permit.

   iii. The Big Muddy River shall be monitored and reported annually for Discharge Rate, Sulfate, Chloride and Hardness upstream of the associated outfall.

Special Condition No. 17: Data collected in accordance with Special Condition Nos. 13, 14, 15 and 16 above will be utilized to evaluate the appropriateness of the effluent limits established in this Permit. Should the Agency's evaluation of this data indicate revised effluent limits are warranted; this permit may be reopened and modified to incorporate more appropriate effluent limitations. This data will also be used for determination of effluent limitations at the time of permit renewal.

Special Condition No. 18: Discharges from Outfall Nos. 001, 003, 008, 013 and 017 shall be monitored twice annually with such monitoring spaced at approximately 6-month intervals during the entire 5-year term of this NPDES. Sampling of the discharges shall be performed utilizing the grab sampling method and analyzed for total (unfiltered) concentrations. The results of the sampling required under this Special Condition shall be submitted twice annually to the Agency in January and July of each calendar year to the addresses indicated in the Special Condition No. 3 above. The parameters to be sampled and the detection limits (minimum reporting levels) are as follows:

Parameter	Detection Limit
Arsenic	0.05 mg/L
Barium	0.50 mg/L
Cadmium	0.001 mg/L
Chromium (hexavalent)	0.01 mg/L
Chromium	0.05 mg/L
Copper	0.005 mg/L
Lead	0.05 mg/L
Manganese	0.50 mg/L
Mercury*	1.00 ng/L**
Nickel	0.005 mg/L
Phenols	0.005 mg/L
Selenium	2.000 µg/L***
Silver	0.003 mg/L
Zinc	0.025 mg/L

* Utilize USEPA Method 1631E and the digestion procedure described in Section 11.1.1.2 of 1631E.
** 1.00 ng/L. (nanogram/liter) = 1 part per trillion.
*** µg/L = micrograms/liter

Attachment H

Standard Conditions

Definitions

Act means the Illinois Environmental Protection Act, 415 ILCS 5 as Amended.

Agency means the Illinois Environmental Protection Agency.

Board means the Illinois Pollution Control Board.

Clean Water Act (formerly referred to as the Federal Water Pollution Control Act) means Pub. L 92-500, as amended. 33 U.S.C. 1251 et seq.

NPDES (National Pollutant Discharge Elimination System) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the Clean Water Act.

USEPA means the United States Environmental Protection Agency.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum Daily Discharge Limitation (daily maximum) means the highest allowable daily discharge.

Average Monthly Discharge Limitation (30 day average) means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Discharge Limitation (7 day average) means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Aliquot means a sample of specified volume used to make up a total composite sample.

Grab Sample means an individual sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes.

24-Hour Composite Sample means a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period.

8-Hour Composite Sample means a combination of at least 3 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over an 8-hour period.

Flow Proportional Composite Sample means a combination of sample aliquots of at least 100 milliliters collected at periodic intervals such that either the time interval between each aliquot or the volume of each aliquot is proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot.

(1) **Duty to comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

(2) **Duty to reapply.** If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. If the permittee submits a proper application as required by the Agency no later than 180 days prior to the expiration date, this permit shall continue in full force and effect until the final Agency decision on the application has been made.

(3) **Need to halt or reduce activity not a defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(4) **Duty to mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(5) **Proper operation and maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up, or auxiliary facilities, or similar systems only when necessary to achieve compliance with the conditions of the permit.

(6) **Permit actions.** This permit may be modified, revoked and reissued, or terminated for cause by the Agency pursuant to 40 CFR 122.62 and 40 CFR 122.63. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(7) **Property rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

(8) **Duty to provide information.** The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency upon request, copies of records required to be kept by this permit.

(9) **Inspection and entry.** The permittee shall allow an authorized representative of the Agency or USEPA (including an authorized contractor acting as a representative of the Agency or USEPA), upon the presentation of credentials and other documents as may be required by law, to:
  (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
  (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
  (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  (d) Sample or monitor at reasonable times, for the purpose of assuring permit compliance, or as otherwise authorized by the Act, any substances or parameters at any location.

(10) **Monitoring and records.**
  (a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
  (b) The permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of this permit, measurement, report or application. Records related to the permittee's sewage sludge use and disposal activities shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503). This period may be extended by request of the Agency or USEPA at any time.
  (c) Records of monitoring information shall include:
    (1) The date, exact place, and time of sampling or measurements;
    (2) The individual(s) who performed the sampling or measurements;
    (3) The date(s) analyses were performed;
    (4) The individual(s) who performed the analyses;
    (5) The analytical techniques or methods used; and
    (6) The results of such analyses.
  (d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Where no test procedure under 40 CFR Part 136 has been approved, the permittee must submit to the Agency a test method for approval. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.

(11) **Signatory requirement.** All applications, reports or information submitted to the Agency shall be signed and certified.
  (a) **Application.** All permit applications shall be signed as follows:
    (1) For a corporation: by a principal executive officer of at least the level of vice president or a person or position having overall responsibility for environmental matters for the corporation:
    (2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
    (3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
  (b) **Reports.** All reports required by permits, or other information requested by the Agency shall be signed by a person described in paragraph (a) or by a duly authorized representative of that person. A person is a duly authorized representative only if:
    (1) The authorization is made in writing by a person described in paragraph (a); and
    (2) The authorization specifies either an individual or a position responsible for the overall operation of the facility, from which the discharge originates, such as a plant manager, superintendent or person of equivalent responsibility; and
    (3) The written authorization is submitted to the Agency.
  (c) **Changes of Authorization.** If an authorization under (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of (b) must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.
  (d) **Certification.** Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

  I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(12) **Reporting requirements.**
  (a) **Planned changes.** The permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility.
  Notice is required when:
    (1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source pursuant to 40 CFR 122.29 (b); or
    (2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements pursuant to 40 CFR 122.42 (a)(1).
    (3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
  (b) **Anticipated noncompliance.** The permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
  (c) **Transfers.** This permit is not transferable to any person except after notice to the Agency.
  (d) **Compliance schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.
  (e) **Monitoring reports.** Monitoring results shall be reported at the intervals specified elsewhere in this permit.
    (1) Monitoring results must be reported on a Discharge Monitoring Report (DMR).

(2) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Agency in the permit.

(f) **Twenty-four hour reporting**. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24-hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and time; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24-hours:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit.

(2) Any upset which exceeds any effluent limitation in the permit.

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Agency in the permit or any pollutant which may endanger health or the environment.

The Agency may waive the written report on a case-by-case basis if the oral report has been received within 24-hours.

(g) **Other noncompliance**. The permittee shall report all instances of noncompliance not reported under paragraphs (12) (d), (e), or (f), at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (12) (f).

(h) **Other information**. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Agency, it shall promptly submit such facts or information.

(13) **Bypass**.

(a) Definitions.

(1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (13)(c) and (13)(d).

(c) Notice.

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph (12)(f) (24-hour notice).

(d) Prohibition of bypass.

(1) Bypass is prohibited, and the Agency may take enforcement action against a permittee for bypass, unless:

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(iii) The permittee submitted notices as required under paragraph (13)(c).

(2) The Agency may approve an anticipated bypass, after considering its adverse effects, if the Agency determines that it will meet the three conditions listed above in paragraph (13)(d)(1).

(14) **Upset**.

(a) Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (14)(c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in paragraph (12)(f)(2) (24-hour notice).

(4) The permittee complied with any remedial measures required under paragraph (4).

(d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(15) **Transfer of permits**. Permits may be transferred by modification or automatic transfer as described below:

(a) Transfers by modification. Except as provided in paragraph (b), a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued pursuant to 40 CFR 122.62 (b) (2), or a minor modification made pursuant to 40 CFR 122.63 (d), to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

(b) Automatic transfers. As an alternative to transfers under paragraph (a), any NPDES permit may be automatically transferred to a new permittee if:
(1) The current permittee notifies the Agency at least 30 days in advance of the proposed transfer date;
(2) The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage and liability between the existing and new permittees; and
(3) The Agency does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement.

(16) All manufacturing, commercial, mining, and silvicultural dischargers must notify the Agency as soon as they know or have reason to believe:
(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant identified under Section 307 of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
(1) One hundred micrograms per liter (100 ug/l);
(2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony.
(3) Five (5) times the maximum concentration value reported for that pollutant in the NPDES permit application; or
(4) The level established by the Agency in this permit.
(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the NPDES permit application.

(17) All Publicly Owned Treatment Works (POTWs) must provide adequate notice to the Agency of the following:
(a) Any new introduction of pollutants into that POTW from an indirect discharge which would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and
(b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
(c) For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

(18) If the permit is issued to a publicly owned or publicly regulated treatment works, the permittee shall require any industrial user of such treatment works to comply with federal requirements concerning:
(a) User charges pursuant to Section 204 (b) of the Clean Water Act, and applicable regulations appearing in 40 CFR 35;
(b) Toxic pollutant effluent standards and pretreatment standards pursuant to Section 307 of the Clean Water Act; and
(c) Inspection, monitoring and entry pursuant to Section 308 of the Clean Water Act.

(19) If an applicable standard or limitation is promulgated under Section 301(b)(2)(C) and (D), 304(b)(2), or 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit, or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked, and reissued to conform to that effluent standard or limitation.

(20) Any authorization to construct issued to the permittee pursuant to 35 Ill. Adm. Code 309.154 is hereby incorporated by reference as a condition of this permit.

(21) The permittee shall not make any false statement, representation or certification in any application, record, report, plan or other document submitted to the Agency or the USEPA, or required to be maintained under this permit.

(22) The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $25,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both.
Additional penalties for violating these sections of the Clean Water Act are identified in 40 CFR 122.41 (a)(2) and (3).

(23) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

(24) The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(25) Collected screening, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes (or runoff from the wastes) into waters of the State. The proper authorization for such disposal shall be obtained from the Agency and is incorporated as part hereof by reference.

(26) In case of conflict between these standard conditions and any other condition(s) included in this permit, the other condition(s) shall govern.

(27) The permittee shall comply with, in addition to the requirements of the permit, all applicable provisions of 35 Ill. Adm. Code, Subtitle C, Subtitle D, Subtitle E, and all applicable orders of the Board or any court with jurisdiction.

(28) The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the remaining provisions of this permit shall continue in full force and effect.

United States Environmental Protection Agency | Office of Enforcement and Compliance Assurance | September 2015

Final NPDES Electronic Reporting Rule

On 24 September 2015, Administrator Gina McCarthy signed the final National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule for publication in the Federal Register. The publication of this rule is the latest step in an extensive multi-year outreach effort with EPA's state, tribal and territorial partners. This rule will replace most paper-based Clean Water Act (CWA) NPDES permitting and compliance monitoring reporting requirements with electronic reporting.

Purpose of the Final Rule

This final rule is designed to save authorized state, tribe, or territorial NPDES programs considerable resources, make reporting easier for NPDES-regulated entities, streamline permit renewals, ensure full exchange of basic NPDES permit data between states and EPA, improve environmental decision-making, and better protect human health and the environment.

This final rule requires that NPDES regulated entities electronically submit the following permit and compliance monitoring information instead of using paper reports:

- Discharge Monitoring Reports (DMRs);
- Notices of Intent to discharge in compliance with a general permit; and
- Program reports.

Authorized NPDES programs will also electronically submit NPDES program data to EPA to ensure that there is consistent and complete reporting nationwide, and to expedite the collection and processing of the data, thereby making it more accurate and timely. Importantly, while the rule changes the method by which information is provided (i.e., electronic rather than paper-based), it does not increase the amount of information required from NPDES regulated entities facilities under existing regulations.

Overview of Benefits

EPA anticipates that the final rule will save significant resources for states, tribes, and territories as well as EPA and NPDES permittees, while resulting in a more complete, accurate, and nationally-consistent set of data about the NPDES program. With full implementation (5 years after the effective date), the anticipated savings are:

- Authorized State NPDES programs: $22.6 million annually,
- NPDES regulated entities: $0.5 million annually, and
- EPA: $1.2 million annually.

the authorized NPDES biosolids program); and all other remaining NPDES program reports. These program reports include:

- Sewage Sludge/Biosolids Annual Program Reports [40 CFR 503] (for the 8 states that implement the Federal Biosolids Program)
- Concentrated Animal Feeding Operation (CAFO) Annual Program Reports [40 CFR 122.42(e)(4)]
- Municipal Separate Storm Sewer System (MS4) Program Reports [40 CFR 122.34(g)(3) and 122.42(c)]
- Pretreatment Program Reports [40 CFR 403.12(i)]
- Significant Industrial User Compliance Reports in Municipalities Without Approved Pretreatment Programs [40 CFR 403.12(e) and (h)]
- Sewer Overflow/Bypass Event Reports [40 CFR 122.41(l)(4), (l)(6) and (7), (m)(3)]
- CWA Section 316(b) Annual Reports [40 CFR 125 Subpart J]

How the final rule addresses comments

In response to concerns about implementation raised during the comment periods, the final rule provides authorized NPDES programs more flexibility to implement the final rule by providing them up to three additional years to electronically collect, manage, and share their data. Authorized NDPES Programs will also have more flexibility in how they can grant electronic reporting waivers.

Further Information

For additional information, please contact Messrs. John Dombrowski, Director, Enforcement Targeting and Data Division (202-566-0742) or Carey A. Johnston (202-566-1014), Office of Compliance (mail code 2222A), Environmental Protection Agency, 1200 Pennsylvania Avenue, N.W., Washington, DC, 20460; e-mail addresses: dombrowkski.john@epa.gov or johnston.carey@epa.gov.

Useful Final Rule Link:

Email sign up for outreach events
https://public.govdelivery.com/accounts/USAEPAOECA/subscriber/new?

Alliance Consulting, Inc.
Engineers · Constructors · Scientists

February 4, 2019

Project No.: B19-003-1413

Mr. James Plumley
FORESIGHT ENERGY, LLC
16824 Liberty School Road
Marion, IL 62959

Wetland and Stream Inventory Report
East Refuse Disposal Area
Franklin County, Illinois
Sugar Camp Energy, LLC
Macedonia, Illinois

Dear Mr. Plumley:

This letter has been prepared to transmit a Wetland and Stream Inventory Report of the project area in association with the proposed East Refuse Disposal Area in Franklin County, Illinois.

The area for this proposed project falls under a previously permitted area (Permit No. 382, Sugar Camp Mine No. 1) that has already been submitted and approved. Several impacts from the refuse area have already been mitigated in the original permit as well. Alliance Consulting, Inc. (Alliance) is pleased to submit the following Wetland and Stream Inventory Report on behalf of our client, Sugar Camp Energy, LLC (Sugar Camp), as a portion of the Joint Application for Section 404/401 CWA Permit and Nationwide Permit 27.

The stream and wetland determinations on the western portion of the proposed project area were conducted in 2005-2007. The stream determination work on the western area was completed in 2007 by Alliance at Sugar Camp's request to be utilized during the permitting process. The initial wetland determinations were conducted in 2005-2007 by HDR/Cochran and Wilken, Inc. (HDR/CWI) of Springfield, Illinois at Sugar Camp's request to be utilized in the permitting process as well. The original Request for Jurisdictional Determination completed by Alliance can be found in Appendix A of this document. A detailed report on the initial wetland determination work can be found in Appendix B of this document. Alliance and HDR/CWI prepared their respective reports in general accordance with the Corps of Engineers Guidance for Stream and Wetland Delineations. A second stream and wetland determination was conducted in 2011/2012 on the eastern portion of the proposed project area. The second Jurisdictional Determination was completed in 2012 by EcoSource, Inc. of Georgetown, Kentucky at Sugar Camp's request to be used during the permitting process. A detailed report on the stream and wetland determination work can be found in Appendix C of this Joint Application. EcoSource prepared this report in general accordance with the Corps of Engineers Guidance for Stream and Wetland Delineations.

The original Request for Jurisdictional Determination (Appendix A), Wetlands Assessment Report (Appendix B) and the second Jurisdictional Determination (Appendix C) are enclosed in this document. The other portions of this report have been updated to only contain the pertinent information for the proposed area (Appendices D-F). The scope of this project is only for a portion of the original permit area and, therefore, attention should be focused on the proposed area for the purposes of this application. The project, as proposed, would impact two of the wetland areas that were delineated by HDR/CWI in the original report (Areas 1 & 2). The project, as proposed, would also impact several of the wetland areas that were delineated by EcoSource in the second report (Areas A-1, A-2, B, C, D, and OWA). It should be noted that Wetland Area 2 from the original report and Wetland Areas B, C, D, and OWA from the second report are in the same location and could be considered the same area. The project, as proposed, would impact several of the stream channels that were delineated by Alliance in the original report (Stream channels: E, G, G4A, G9A, G9B, and G4-G12). The project, as proposed, would also impact several of the channels that were delineated by EcoSource in the second report (Stream Channels: SR1-SR6 and SR15). This proposed area includes approximately 523.70 acres, which, if approved, will have a coal refuse disposal area constructed on it for the purpose of refuse storage.

If you have any questions or require clarification, please do not hesitate to call.

Respectfully submitted,

ALLIANCE CONSULTING, INC.

Daniel E. Brady
Staff Scientist

Braden A. Hoffman
Project Manager

APPENDIX A

REQUEST FOR JURISDICTIONAL DETERMINATION LETTER REPORT (ALLIANCE, 2008)

REQUEST FOR JURISDICTIONAL DETERMINATION
CORPS REGULATORY BRANCH FILE NO. MVS-2008-18

SUGAR CAMP MINE NO. 1
NEAR MACEDONIA, FRANKLIN COUNTY ILLINOIS

PREPARED FOR

SUGAR CAMP ENERGY, LLC
JOHNSTON CITY, ILLINOIS

ALLIANCE PROJECT NO. B07-021-1413
MARCH 2008

APPENDIX B

WETLANDS ASSESSMENT REPORT
(HDR/CWI, 2007)

Sugar Camp Mine #1 – Wetlands Delineation Report

Figures

Tables

Appendices

APPENDIX C

JURISDICTIONAL STREAMS AND WETLANDS DETERMINATIONS (ECOSOURCE, 2012)

Sugar Camp Energy LLC
DNR No. 382, Revision 4
Sugar Camp Mine No. 1

Jurisdictional Streams and Wetland Determinations

Submitted to

CBC Engineers & Associates Ltd.
Lexington, Kentucky

February 2012

APPENDIX F

NRCS WEB SOIL SURVEY REPORT
(GENERATED 2019)

United States Department of Agriculture

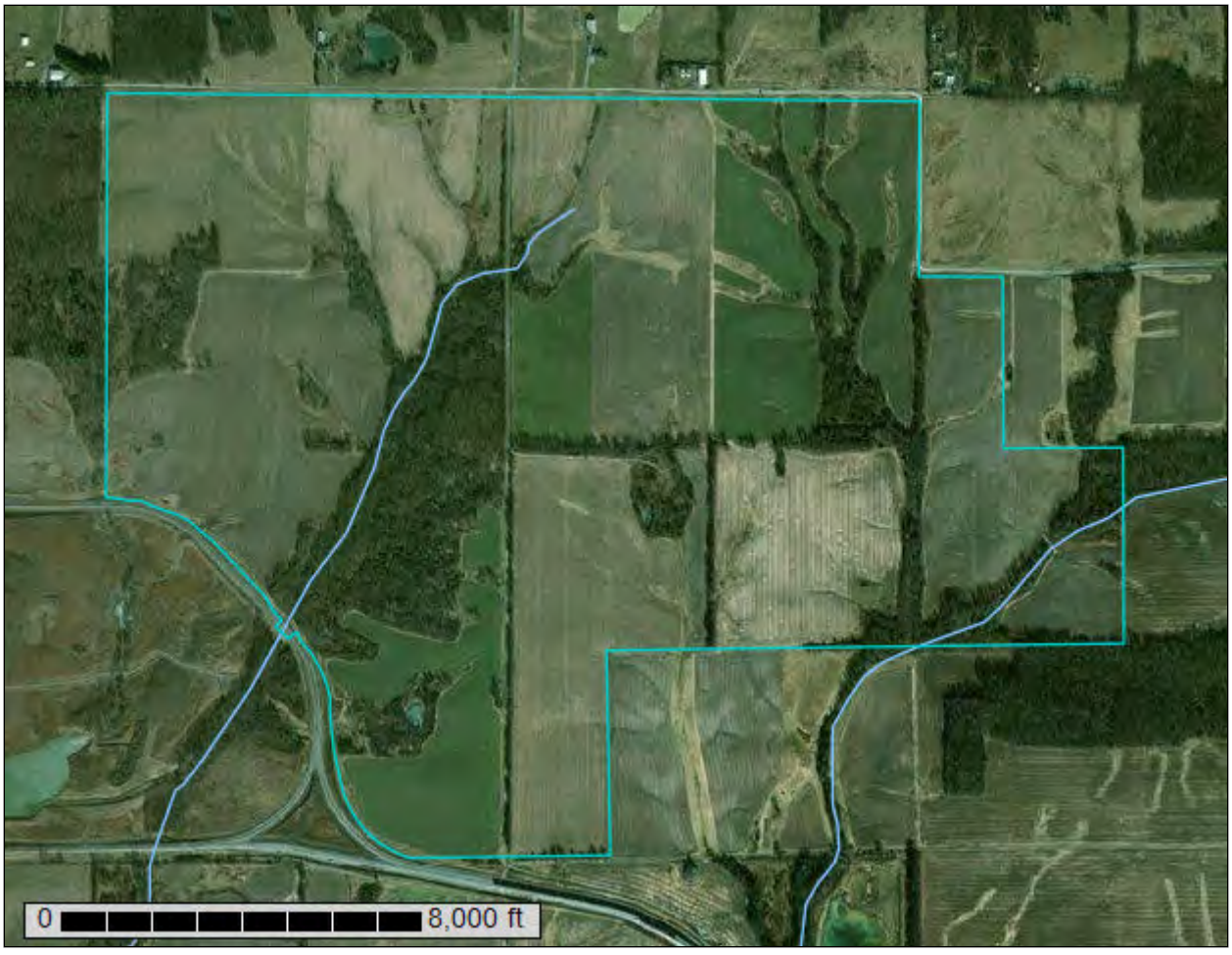
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Franklin County, Illinois

East Refuse Area



January 25, 2019

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Southern Illinois Sub-Office (ES)
8588 Route 148
Marion, Illinois 62959

FWS/SISO

August 4, 2017

Mr. Scott K. Fowler
Illinois Department of Natural Resources
Office of Mines and Minerals
Land Reclamation Division
One Natural Resources Way
Springfield, Illinois 62702-1271

Dear Mr. Fowler:

Thank you for your letter dated April 12, 2017, requesting review of significant revision No. 6 to permit 382 by Sugar Camp Energy, LLC (No. 1 Mine), for surface coal mining and reclamation operations in Hamilton and Franklin Counties, Illinois. The revision will add 37,971.9 acres of shadow area to existing permit No. 382. These comments are provided under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*); the Migratory Bird Treaty Act (40 Stat. 755, as amended; 16 U.S.C. 703 *et seq.*) and, the National Environmental Policy Act (83 Stat. 852, as amended P.L. 91-190, 42 U.S.C. 4321 et seq.).

Threatened and Endangered Species

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain from the Fish and Wildlife Service (Service) information concerning any species, listed or proposed to be listed, that have ranges which include the project area. As the State of Illinois has been delegated the responsibility of issuing mining permits by the Office of Surface Mining, we are providing the following list of threatened and endangered species to assist in your evaluation of the proposed permit. The list for the proposed permit area includes the endangered Indiana bat (*Myotis sodalis*), endangered piping plover (*Charadrius melodus*), and threatened northern long-eared bat (*Myotis septentrionalis*). There is no designated critical habitat in the project area at this time.

Information provided in the permit application indicates that there is no surface disturbance proposed in this revision and therefore no impacts to listed species are anticipated. Based on the information provided in the permit application, the Service concurs that the proposed permit actions are not likely to adversely affect any federally listed species. Although no surface

disturbance is proposed in this revision, post-subsidence mitigation may be necessary to restore pre-existing drainage patterns which could result in impacts to forested riparian areas.

- The Service recommends that any tree clearing be minimized or avoided if possible to reduce impacts to potential habitat for the Indiana bat and northern long-eared bat. If tree clearing is necessary, it should not occur during the April 1 thru October 14 time frame. Also, any forested areas impacted by post-subsidence mitigation should be restored.

Fish and Wildlife Resources

Although no surface disturbance is proposed in this revision, post-subsidence mitigation may be necessary to restore pre-existing drainage patterns which could result in impacts to streams and wetlands. Activities in the project area that would alter these streams or wetlands may require a Section 404 permit from the US Army Corps of Engineers.

- The Service recommends that impacts to streams and wetlands be avoided or impacts minimized to the greatest extent possible. If a permit is required than an appropriate mitigation plan should be developed and coordinated with the Service.

Migratory Birds

Although the bald eagle has been removed from the threatened and endangered species list, it continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (BGEPA). The Service developed the National Bald Eagle Management Guidelines to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the BGEPA. A copy of the guidelines is available at:

http://www.fws.gov/midwest/eagle/pdf/NationalBaldEagleManagementGuidelines.pdf

- The Service is unaware of any bald eagle nests in the permit area; however, if a bald eagle nest is found in the permit area or vicinity of the permit area then our office should be contacted and the guidelines implemented.

Thank you for the opportunity to comment on the proposed surface mining permit and provide information concerning threatened and endangered species. If you have any questions, please contact me at (618) 997-3344, ext. 345.

Sincerely,

/s/ Matthew T. Mangan

Matthew T. Mangan
Fish and Wildlife Biologist

Alliance Consulting, Inc.
Engineers · Constructors · Scientists

February 26, 2015

Project No. B12-603-1413

Mr. Matthew Mangan
U.S. FISH AND WILDLIFE SERVICE
Marion Field Office
8588 Route 148
Marion, IL 62959

Comprehensive Bat Survey Demonstration
Sugar Camp Mine No.1 and North Refuse Disposal Facility,
Franklin and Hamilton Counties, Illinois
Sugar Camp Energy, LLC
Macedonia, Illinois

Dear Mr. Mangan:

On behalf of our client, Sugar Camp Energy, LLC (Sugar Camp), this letter has been prepared to present the results of five years of endangered bat species surveys and monitoring within the Sugar Camp Mine No. 1 project area, one year of endangered bat species surveys and monitoring within the North Refuse Disposal Facility, and one year of acoustic survey within the North Refuse Disposal Facility. The various surveys were conducted in association with the proposed construction of each project or with monitoring plans established for the project. Alliance Consulting, Inc. (Alliance) conducted the surveys and presented the results each year accordingly. This document has been prepared as a comprehensive summary of Indiana bats, captured or detected, for all of the surveys conducted for Sugar Camp Energy, LLC, from 2010-2014.

1.0 PURPOSE

The purpose of these surveys was to determine the presence/absence of endangered bat species within and adjacent to the proposed Sugar Camp Mine No. 1 Shadow Area and the North Refuse Disposal Facility and annual monitoring of the identified colony as required by your office, based upon the 2010 protection and enhancement plan approved by your office, mist net surveys and telemetry tracking were required. This document also represents Alliance's findings during a voluntary acoustic and mist net survey within the North Refuse Disposal Facility project area, which was conducted at twice the minimal level of recommended effort. This survey was conducted to determine the usage of the North Refuse Area by Indiana bats since it is within known habitat (2.5 miles of maternity roost).

2.0 INTRODUCTION

Alliance Consulting, Inc.
Engineers • Constructors • Scientists

A SUMMER SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (*MYOTIS SODALIS*) AND THE THREATENED NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*)

VIKING SHADOW AREA 1
PERMIT NO. 382/NPDES IEPA LOG NO. 1357-07
NEAR MACEDONIA,
FRANKLIN AND HAMILTON COUNTIES, ILLINOIS

Prepared for:

SUGAR CAMP ENERGY, LLC
JOHNSTON CITY, ILLINOIS

ALLIANCE PROJECT NO. B17-112-1413
SEPTEMBER 2017

Beckley, WV
Raleigh County Airport Industrial Park
124 Philpott Lane
Beaver, WV 25813-9502
Telephone: (304) 255-0491
Fax: (304) 255-4232

Canonsburg, PA

3 Four Coins Drive, Ste. 100
Canonsburg, PA 15317
Telephone: (724) 745-3630
Fax: (724) 745-3631

Alliance Consulting, Inc.
Engineers • Constructors • Scientists

A SUMMER SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (*MYOTIS SODALIS*) AND THE THREATENED NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*)

VIKING SHADOW AREA 2
PERMIT NO. 382/NPDES IEPA LOG NO. 1357-07
NEAR MACEDONIA,
FRANKLIN AND HAMILTON COUNTIES, ILLINOIS

Prepared for:

SUGAR CAMP ENERGY, LLC
JOHNSTON CITY, ILLINOIS

ALLIANCE PROJECT NO. B17-112-1413
JULY 2017

Beckley, WV
Raleigh County Airport Industrial Park
124 Philpott Lane
Beaver, WV 25813-9502
Telephone: (304) 255-0491
Fax: (304) 255-4232

Canonsburg, PA
3 Four Coins Drive, Ste. 100
Canonsburg, PA 15317
Telephone: (724) 745-3630
Fax: (724) 745-3631

Alliance
Consulting, Inc.
Engineers • Constructors • Scientists

A SUMMER SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (*MYOTIS SODALIS*) AND THE THREATENED NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*)

SUGAR CAMP SHADOW AREA 3
PERMIT NO. 382
FRANKLIN AND HAMILTON COUNTIES, ILLINOIS

Prepared for:
SUGAR CAMP ENERGY, LLC
JOHNSTON CITY, ILLINOIS

ALLIANCE PROJECT NO. B17-111-1413
JULY 2017

Beckley, WV
Raleigh County Airport Industrial Park
124 Philpott Lane
Beaver, WV 25813-9502
Telephone: (304) 255-0491
Fax: (304) 255-4232

Canonsburg, PA
3 Four Coins Drive, Ste. 100
Canonsburg, PA 15317
Telephone: (724) 745-3630
Fax: (724) 745-3631

Alliance Consulting, Inc.
Engineers • Constructors • Scientists

A SUMMER SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (*MYOTIS SODALIS*) AND THE THREATENED NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*)

SUGAR CAMP SHADOW AREA 4
PERMIT NO. 382/NPDES IEPA LOG NO. 1357-07
NEAR MACEDONIA,
FRANKLIN AND HAMILTON COUNTIES, ILLINOIS

Prepared for:

SUGAR CAMP ENERGY, LLC
JOHNSTON CITY, ILLINOIS

ALLIANCE PROJECT NO. B17-111-1413
SEPTEMBER 2017

Beckley, WV
Raleigh County Airport Industrial Park
124 Philpott Lane
Beaver, WV 25813-9502
Telephone: (304) 255-0491
Fax: (304) 255-4232

Canonsburg, PA
3 Four Coins Drive, Ste. 100
Canonsburg, PA 15317
Telephone: (724) 745-3630
Fax: (724) 745-3631

Alliance Consulting, Inc.
Engineers • Constructors • Scientists

A SUMMER SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (*MYOTIS SODALIS*) AND THE THREATENED NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*)

SUGAR CAMP EAST REFUSE DISPOSAL AREA
PERMIT NO. 382
NEAR MACEDONIA, FRANKLIN COUNTY, ILLINOIS

Prepared for:
SUGAR CAMP ENERGY, LLC
JOHNSTON CITY, ILLINOIS

ALLIANCE PROJECT NO. B19-003-1413
OCTOBER 2019

Charleston, WV	Beckley, WV	Canonsburg, PA
928 Cross Lanes Drive, Suite 300 Charleston, WV 25313 Telephone: (681) 217-2090 Fax: (681) 217-2092	Raleigh County Airport Industrial Park 124 Philpott Lane Beaver, WV 25813-9502 Telephone: (304) 255-0491 Fax: (304) 255-4232	3 Four Coins Drive, Ste. 100 Canonsburg, PA 15317 Telephone: (724) 745-3630 Fax: (724) 745-3631

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902

Ms. Rachel Leibowitz
Deputy State Historic Preservation Officer
Preservation Services Division
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62701-1507

Dear Ms. Leibowitz:

TENNESSEE VALLEY AUTHORITY (TVA), INITATION OF CONSULTATION, SUGAR CAMP MINE NO.1 EXPANSION PROJECT (IDNR PERMIT NO. 382 REVISION 6)

Sugar Camp Energy, LLC (Sugar Camp) proposes to expand mining operations of its Mine No. 1 in Franklin and Hamilton Counties in southern Illinois. The proposed expansion (approximately 37,972 acres) includes approximately 12,125 acres of TVA-owned coal (Figure 1). Planned subsidence is included in Sugar Camp's proposed mining plan. Subsidence would only occur under a portion of the project area (Figure 1:Permit No 382 Revision 6 Shadow Area). Surface activities to support the underground mining of TVA-owned coal would include construction of approximately five bleeder shafts and installation of associated utilities needed to operate the bleeder shafts. The exact location and nature of these surface activities is unknown at this time but they would occur within the project area shown in purple in Figure 1. . TVA has determined the area of potential effects (APE) as the footprint of the project area (12,125) as well as the five bleeder shafts and installation of associated utilities needed to operate the bleeder shafts where physical effects could occur, as well as areas within a half-mile radius of the project within which the project would be visible, where visual effects on above-ground resources could occur.

Per the *Programmatic Agreement between the Illinois Historic Preservation Agency and the Illinois Department of Natural Resources*, "shadow areas in which there will be no surface disturbance" are a class of exempt activities which are "considered to have no effect on historic properties" (Enclosed).TVA agrees with the Programmatic Agreement finding that no archaeological resources will be affected within the shadow area where no surface disturbance is propose, although TVA will take into account any potential effects to architectural historic properties that may be effected by the subsidence.

By this letter, TVA is initiating consultation regarding the proposed undertaking. Due to the size and scope of the project TVA proposes to proceed under phases as provided under 36 CFR § 800.4(b)(2) and § 800.5(c)(1). Once the locations of the bleeder shafts and associated infrastructure are identified, TVA will conduct a Phase I Cultural Resources survey of the APE and provide to your office for consultation.

Pursuant to 36 C.F.R. Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the National Register of Historic Places.

Please contact Michaelyn Harle by telephone (865) 632-2248 or by email, mharle@tva.gov with your comments.

Sincerely,

Clinton E. Jones
Manager
Cultural Compliance

INTERNAL COPIES NOT TO BE INCLUDED WITH OUTGOING LETTER:

Michael C. Easley, BR 2C-C
Patricia B. Ezzell, WT 7C-K
Travis A. Giles, BR 2C-C
Michaelyn S. Harle, WT 11C-K
Susan R. Jacks, WT 11C-K
Paul J. Pearman, BR 2C-C
M. Susan Smelley, BR 2C-C
Elizabeth Smith, WT 11C-K
Rebecca C. Tolene, WT 7B-K
ECM, WT CA-K

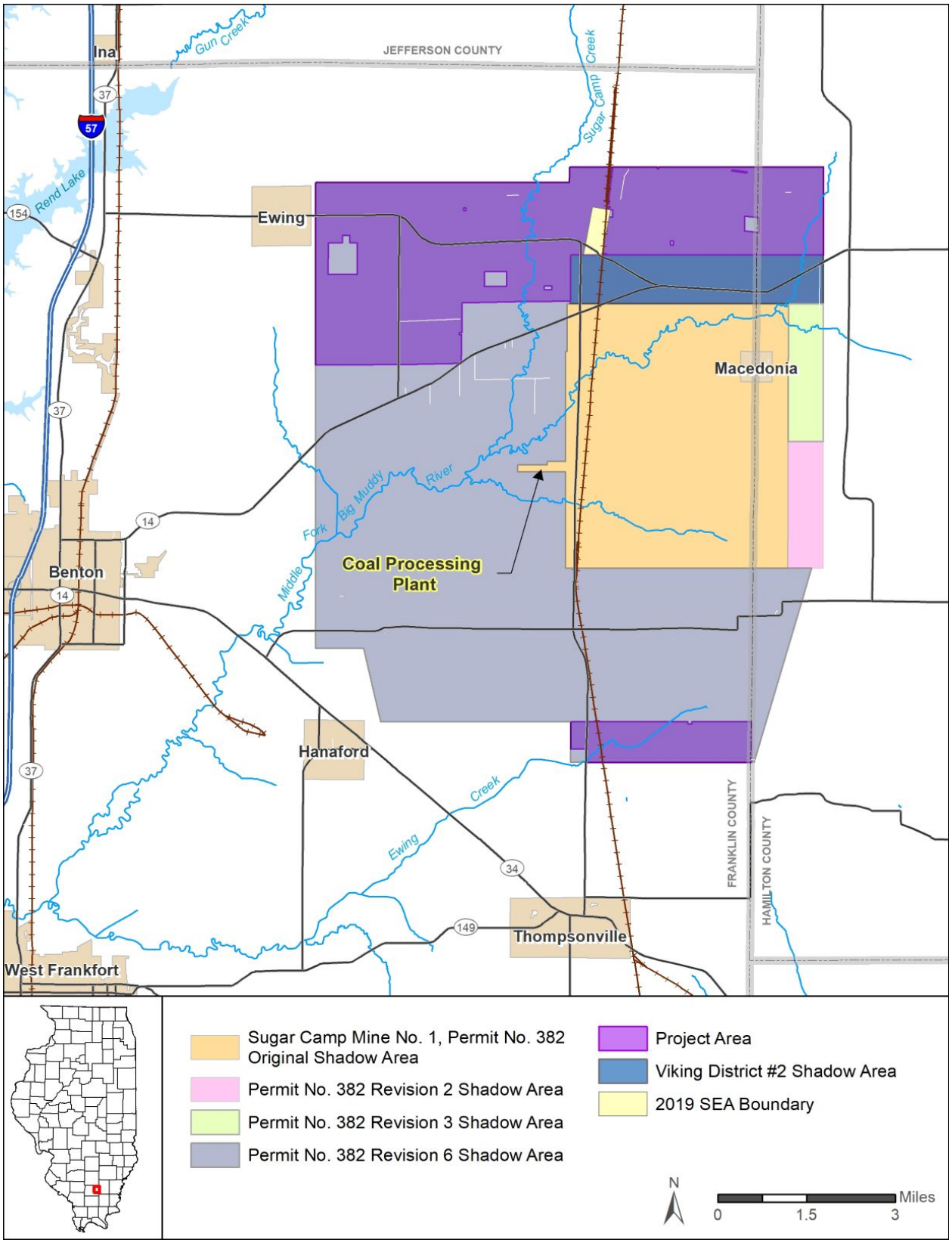


Figure 1. Location of the proposed project area and shadow area.

Miami Tribe of Oklahoma

3410 P St. NW, Miami, OK 74354 ● P.O. Box 1326, Miami, OK 74355
Ph: (918) 541-1300 ● Fax: (918) 542-7260
www.miamination.com

Via email: mmshuler@tva.gov

December 13, 2019

Marianne Shuler
Senior Specialist, Archaeologist and Tribal Liaison
Cultural Compliance
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902

Re: Sugar Camp Mine No. 1 Expansion Project – Comments of the Miami Tribe of Oklahoma

Dear Ms. Shuler:

Aya, kikwehsitoole – I show you respect. My name is Diane Hunter, and I am the Tribal Historic Preservation Officer for the Federally Recognized Miami Tribe of Oklahoma. In this capacity, I am the Miami Tribe's point of contact for all Section 106 issues.

The Miami Tribe offers no objection to the above-mentioned project at this time, as we are not currently aware of existing documentation directly linking a specific Miami cultural or historic site to the project site. However, as this project is within the aboriginal homelands of the Miami Tribe, if any human remains or Native American cultural items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) or archaeological evidence is discovered during any phase of this project, the Miami Tribe requests immediate consultation with the entity of jurisdiction for the location of discovery. In such a case, please contact me at 918-541-8966 or by email at dhunter@miamination.com to initiate consultation.

The Miami Tribe accepts the invitation to serve as a consulting party to the proposed project. In my capacity as Tribal Historic Preservation Officer I am the point of contact for consultation.

Respectfully,

Diane Hunter

Diane Hunter
Tribal Historic Preservation Officer

Osage Nation Historic Preservation Office

Date: **January 11, 2020** **File: 1920-2160IL-11**

RE: **Tennessee Valley Authority (TVA), Sugar Camp Mine No. 1 Expansion Project, Franklin and Hamilton Counties, Illinois**

Tennessee Valley Authority
Marianne Shuler
400 West Summit Hill Drive
Knoxville, TN 37902

Dear Ms. Shuler,

The Osage Nation has received notification and accompanying information for the proposed project listed as Tennessee Valley Authority (TVA), Sugar Camp Mine No. 1 Expansion Project, Franklin and Hamilton Counties, Illinois. **The Osage Nation Historic Preservation Office requests a copy of the cultural resource survey report for review and comment.**

In accordance with the National Historic Preservation Act, (NHPA) [54 U.S.C. § 300101 et seq.] 1966, undertakings subject to the review process are referred to in 54 U.S.C. § 302706 (a), which clarifies that historic properties may have religious and cultural significance to Indian tribes. Additionally, Section 106 of NHPA requires Federal agencies to consider the effects of their actions on historic properties (36 CFR Part 800) as does the National Environmental Policy Act (43 U.S.C. 4321 and 4331-35 and 40 CFR 1501.7(a) of 1969).

The Osage Nation has a vital interest in protecting its historic and ancestral cultural resources. **The Osage Nation anticipates reviewing and commenting on the survey report for the proposed Tennessee Valley Authority (TVA), Sugar Camp Mine No. 1 Expansion Project, Franklin and Hamilton Counties, Illinois.**

Should you have any questions or need any additional information please feel free to contact me at the number listed below. Thank you for consulting with the Osage Nation on this matter.

Bobi Deere
Archaeologist

627 Grandview * Pawhuska, OK 74056 Telephone 918-287-5328 * Fax 918-287-5376

Contract Publication Series 07-001

A CULTURAL RESOURCE SURVEY FOR THE PROPOSED REFUSE DISPOSAL AREA FOR THE SUGARCAMP NO. 1 COAL MINE OPERATION, FRANKLIN COUNTY, ILLINOIS

By Brian G. DelCastello, M.A.

With contributions by Jennifer M. Faberson, Lori O'Connor, MSLS, and Trent Spurlock

Cultural Resource Analysts, Inc.

Contract Publication Series 07-001

A CULTURAL RESOURCE SURVEY FOR THE PROPOSED REFUSE DISPOSAL AREA FOR THE SUGARCAMP NO. 1 COAL MINE OPERATION, FRANKLIN COUNTY, ILLINOIS

by

Brian G. DelCastello, M.A.

With contributions by Jennifer M. Faberson, Lori O'Connor, MSLS, and Trent Spurlock

Prepared for

Tim Myers
Sugarcamp Energy, LLC.
430 Harper Park Drive
Beckley, WV 25801
Phone: (618) 993-0650
Fax: (618) 993-8125

Prepared by

Cultural Resource Analysts, Inc.
151 Walton Avenue
Lexington, Kentucky 40508
Phone: (859) 252-4737
Fax: (859) 254-3747
E-mail: cmniquette@crai-ky.com
CRAI Project No.: K06S019

Charles M. Niquette, RPA
Co-Principal Investigator

Richard L. Herndon, RPA
Co-Principal Investigator

December 20, 2007

Lead Agency: Illinois Department of Natural Resources, Division of Mine Permits

Doc#17664 R0803120 9

Contract Publication Series 05-162

AN ARCHAEOLOGICAL SURVEY OF THE PROPOSED SUGAR CAMP NO. 1 COAL MINE OPERATION BETWEEN AKIN CREEK AND THE MIDDLE FORK OF THE BIG MUDDY RIVER, FRANKLIN COUNTY, ILLINOIS (PERMIT APPLICATION NO. 382)

by

Brian G. DelCastello, M.A.

With contributions by Rebecca Miller Gillespie, Pamela J. Richardson, M.A., and Trent Spurlock

Prepared for

Douglas A. Dobbins
Sugar Camp Energy, LLC
3303 ½ Commercial Drive
PO Box 1829
Marion, IL 62959
Phone: (618) 998-8010
Fax: (618) 998-8012

Prepared by

Cultural Resource Analysts, Inc.
151 Walton Avenue
Lexington, Kentucky 40508
Phone: (859) 252-4737
Fax: (859) 254-3747
E-mail: cmniquette@crai-ky.com
CRAI Job No.: K05C006

Charles M. Niquette, RPA
Co-Principal Investigator

Richard L. Herndon, RPA
Co-Principal Investigator

April 4, 2006

Lead Agency: Illinois Department of Natural Resources, Division of Mine Permits
Permit Application Number 382

tva.com

tva.com