

Skyline Mine Flat Canyon Coal Lease Tract
Mining Plan Modification
Environmental Assessment



Prepared in cooperation with the
U.S. Department of the Interior Bureau of Land Management, U.S. Department of Agriculture Forest
Service, and Utah Division of Oil, Gas and Mining

U.S. Department of the Interior
Office of Surface Mining Reclamation and Enforcement

Program Support Division
1999 Broadway, Suite 3320
Denver, CO 80202
Phone 303-293-5000
Fax 303-293-5032



Table of Contents

Chapter 1 Introduction..... 1

1.1 Introduction 1

1.2 Background 1

1.3 Regulatory Framework and Necessary Authorizations 4

1.4 Purpose and Need for the Proposed Action 6

 1.4.1 Purpose 6

 1.4.2 Need..... 6

1.5 Outreach and Issues Identification 6

Chapter 2 Proposed Action and Alternatives..... 9

2.1 Introduction 9

2.2 Existing Operations..... 9

 2.2.1 Mining Methods 11

 2.2.2 Topsoil..... 11

 2.2.3 Waste Rock Storage..... 11

 2.2.4 Access and Haul Roads..... 11

 2.2.5 Power Lines 11

 2.2.6 Ponds, Impoundments, Diversions..... 12

 2.2.7 Water Source..... 14

 2.2.8 Hazardous Materials 14

 2.2.9 Mine Personnel..... 14

 2.2.10 Rail Transport 14

 2.2.11 Reclamation..... 15

 2.2.12 Life of Operations 16

 2.2.13 Project Design Features 16

2.3 Proposed Action Alternative..... 23

 2.3.1 Topsoil..... 23

 2.3.2 Waste Rock Storage..... 25

 2.3.3 Access and Haul Roads..... 25

 2.3.4 Power Lines 25

 2.3.5 Mine Facilities 25

 2.3.6 Ponds, Impoundments, Diversion 25

 2.3.7 Water Source..... 25

 2.3.8 Hazardous Material..... 25

 2.3.9 Mine Personnel..... 25

 2.3.10 Rail Transport 25

 2.3.11 Reclamation..... 25

 2.3.12 Life of Operations 25

 2.3.13 Project Design Features 26

2.4 No Action 31

 2.4.1 Alternatives Considered but Eliminated from Detailed Analysis 32

Chapter 3 Affected Environment..... 35

3.1 Introduction 35

3.2 Topography and Geology 48

3.3	Air Quality and Climate Change	52
3.3.1	Air Quality.....	52
3.3.2	Climate Change.....	60
3.4	Social and Economic	62
3.5	Greater Sage-Grouse	64
3.6	Water Resources	67
3.6.1	Surface Water	67
3.6.2	Groundwater.....	69
3.6.3	Surface and Groundwater Quality.....	69
3.6.4	Mine Dewatering and Discharges	70
3.7	Soils	71
Chapter 4 Direct and Indirect Impacts		73
4.1	Introduction	73
4.1.1	Summary of Direct and Indirect Environmental Impacts.....	74
4.2	Topography and Geology	75
4.2.1	Proposed Action	75
4.2.2	No Action.....	76
4.3	Air Quality and Climate Change	76
4.3.1	Proposed Action	77
4.3.2	No Action.....	86
4.4	Social and Economic	87
4.4.1	Proposed Action	87
4.4.2	No Action.....	88
4.5	Greater Sage-Grouse	89
4.5.1	Proposed Action	89
4.5.2	No Action.....	89
4.6	Water Resources	90
4.6.1	Proposed Action	90
4.6.2	No Action.....	94
4.7	Soils	94
4.7.1	Proposed Action	94
4.7.2	No Action.....	95
Chapter 5 Cumulative Impacts		97
5.1	Introduction	97
5.1.1	Analysis Areas.....	97
5.1.2	Past, Present, and Reasonably Foreseeable Actions	97
5.2	Cumulative Impacts	99
5.2.1	Topography and Geology	99
5.2.2	Air Quality and Climate Change.....	99
5.2.3	Social and Economic	101
5.2.4	Greater Sage-Grouse	102
5.2.5	Water.....	102
5.2.6	Soils	102
Chapter 6 Coordination and Consultation		103

6.1 Agencies and People Consulted 103
 6.1.1 Public Comment Process..... 103
 6.1.2 Tribal Consultation..... 104
6.2 Preparers and Participants 104
Chapter 7 References 107

List of Tables

Table 1. Approved Facilities and Acres of Disturbance 9
 Table 2. Annual Shipments to Power Plants from Skyline Mine #3*, 2010-2015 10
 Table 3. Summary of the Proposed Action 23
 Table 4. Issue Disposition 36
 Table 5. NAAQS 54
 Table 6. Federal Prevention of Significant Deterioration Limits 55
 Table 7. MATS Emission Requirements – Coal and Oil-Fired Units 57
 Table 8. Utah Large Industrial Source Emissions (Tons per Year) by Facility - 2012 58
 Table 9. 2012 Oil and Gas Compressor and Gas Plant Emissions (Tons per Year) 58
 Table 10. 1995-2014 Estimated US Greenhouse Gas Emissions Allocated to Economic Sectors (Million Metric Tons of CO_{2e}) 61
 Table 11. U.S. SO₂ (Indirect GHG) Emissions..... 61
 Table 12. Employment by Industry – Carbon and Sanpete Counties..... 63
 Table 13. 2015 Electricity Generation Fuel Sources..... 64
 Table 14. Comparison of Direct and Indirect Impacts 74
 Table 15. Regulated Pollutants Evaluated for Air Quality Permit 77
 Table 16. Skyline Mine Criteria Pollutant Emission Calculations (tons per year) 79
 Table 17. Black Carbon Emissions (tons per year) from Haul Trucks, Proposed Action 80
 Table 18. Direct GHG Emissions (metric tons per year), Maximum 8 Million Tons 82
 Table 19. Ozone Precursor Emissions Rates Based on the Maximum Annual Coal Mined Production Limit..... 82
 Table 20. Railcar Criteria Pollutant Emissions..... 83
 Table 21. GHG Coal Combustion Emissions, Proposed Action 85
 Table 22 Rail Transport GHG Emissions..... 86
 Table 23. 2011 Triennial Inventory (tons/year) 99
 Table 24. Skyline Mine Direct and Indirect Emissions as a Percentage of the Utah Cumulative Total Emissions..... 100
 Table 25. List of Preparers 104
 Table 26. Contractors..... 105

List of Figures

Figure 1. Project Location2
Figure 2. Skyline Mine Coal Flow Diagram 13
Figure 3. Proposed Action24
Figure 4. Topography.....49
Figure 5. Previous Mining50
Figure 6. Generalized Columnar Section51
Figure 7. Regional Airshed53
Figure 8. Sage Grouse Priority Habitat Management Areas.....66
Figure 9. Watershed Boundaries68
Figure 10. Subsidence91
Figure 11. Project Vicinity Coal Mines.....98

Appendices

Appendix A Outreach Letter and Legal Notice

Appendix B Water Monitoring Results

Acronyms

Acronym	Definition
μS/cm	micro-Siemens per centimeter
BLM	Bureau of Land Management
CAA	Clean Air Act of 1970, as amended
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalent
CO ₃	Carbon trioxide
CWA	Clean Water Act of 1972
DEQ	Department of Environmental Quality (Utah)
DOGM	Division of Oil, Gas and Mining (Utah)
EA	environmental assessment
EIS	environmental impact statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FCLAA	Federal Coal Leasing Amendments Act of 1976
FEIS	final environmental impact statement
FLPMA	Federal Land Policy and Management Act of 1976
GHG	greenhouse gas
gpm	gallons per minute
GWh	Gigawatt hours
HAPs	hazardous air pollutants
HCO ₃	bicarbonate
HFCs	hydrofluorocarbons
MER	Maximum Economic Recovery
Mg	Magnesium
mg/L	Milligrams per liter
MLA	Mineral Leasing Act of 1920
MMPA	Mining Minerals Policy Act of 1970
MPDD	mining plan decision document
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
NO _x	nitrogen oxide
NRCS	Natural Resources Conservation Service
O ₃	ozone
OSMRE	Office of Surface Mining Reclamation and Enforcement
PAP	Permit application package
Pb	lead
PFCs	Perfluorocarbons
PM ₁₀	Particulate matter less than 10 microns in diameter
PM _{2.5}	Particulate matter less than 2.5 microns in diameter
R2P2	Resource Recovery and Protection Plan
ROD	Record of Decision
SF ₆	Sulfur hexafluoride
SHPO	State Historic Preservation Office

Acronym	Definition
SIR	Supplemental Information Report
SMCRA	Surface Mining Control and Reclamation Act of 1977
SC-CO ₂	Social Cost of Carbon
SO ₂	sulfur dioxide
SO ₄	Sulfate
SR	State Route
TDS	total dissolved solids
UAC	Utah Administrative Code
UDAQ	Utah Division of Air Quality
UDWR	Utah Division of Wildlife Resources
UPDES	Utah Pollutant Discharge Elimination System
VOC	Volatile Organic Compounds

Chapter 1

Introduction

1.1 Introduction

This Environmental Assessment (EA) has been prepared by the U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region Office, in cooperation with the Utah Division of Oil, Gas and Mining (DOGM); the U.S. Forest Service, Manti-La Sal National Forest; and the Bureau of Land Management (BLM) Utah State Office and Price Field Office. The EA analyzes the potential environmental impacts of a mining plan modification proposed by Canyon Fuel Company, owned by Bowie Resource Holdings, to underground mine federally leased coal in the Flat Canyon Federal Coal Lease Tract UTU-77114 at the Skyline Mine. Canyon Fuel Company submitted a permit application package (PAP) which included Flat Canyon Federal Coal Least Tract UTU-77114 into their Surface Mining Control and Reclamation Act of 1977 (SMCRA) permit. Including the lease UTU-77114 would extend the life of the Skyline Mine, near Helper, Utah, by approximately 9 to 12 years.

The mining plan modification would authorize mining activities to produce up to 8 million tons per year of coal from UTU-77114. However, it is anticipated that the Skyline mine would likely produce 3 to 4.5 million tons per year, which has been their general range of production over the past 10 years.

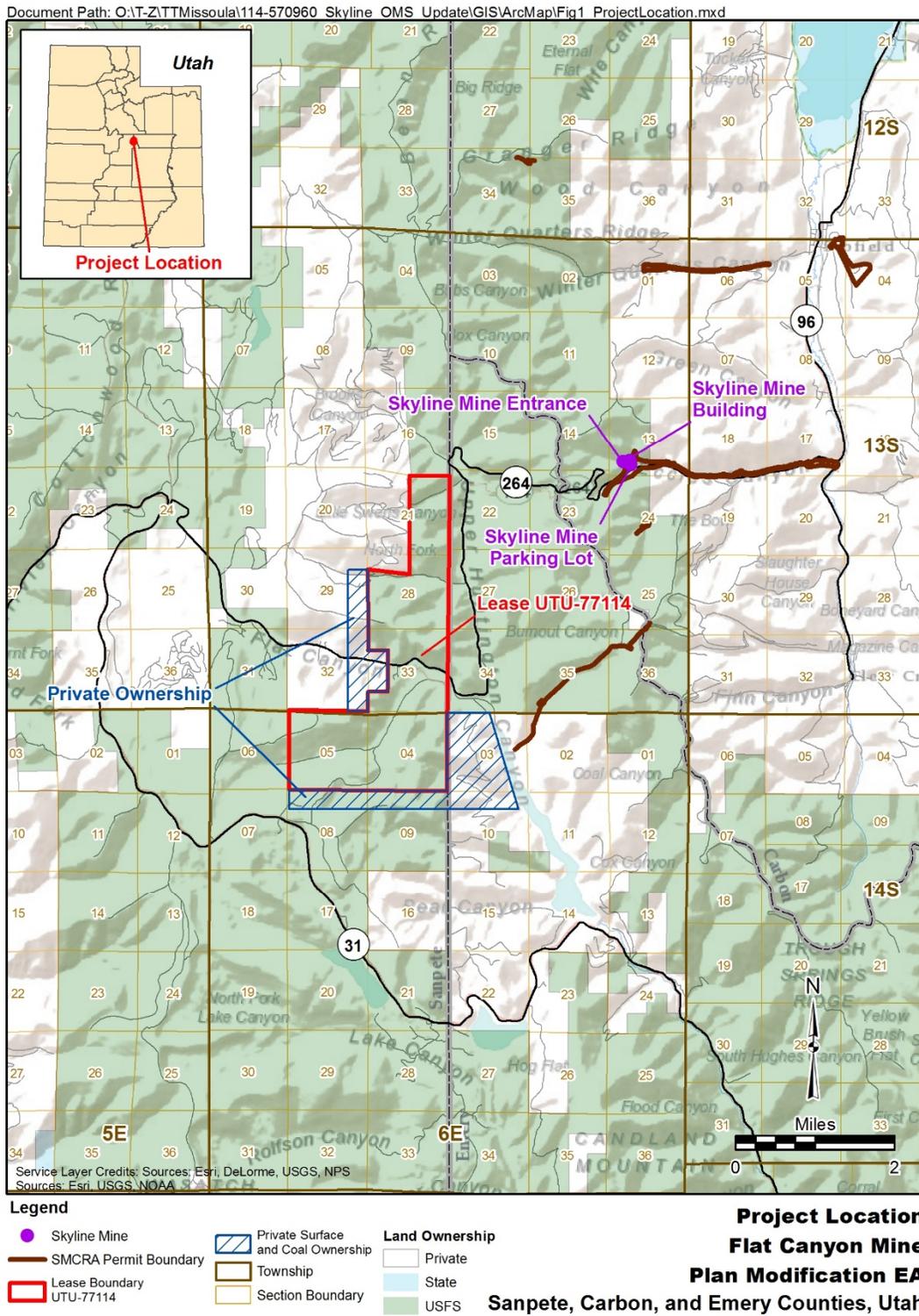
The EA review has been conducted in accordance with the National Environmental Policy Act of 1969 (NEPA) and the President's Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); DOI regulations for implementation of NEPA (43 CFR Part 46); DOI Departmental Manual Part 516; and OSMRE guidance on implementing NEPA, including the OSMRE Handbook on Procedures for Implementing the National Environmental Policy Act (OSMRE 1989). Information gathered from federal, state, and local agencies, Canyon Fuel Company, and publicly available literature, as well as in-house OSMRE sources such as Canyon Fuel Company's PAP, were used in the preparation of this EA.

The NEPA requires federal agencies to disclose the potential environmental impacts of projects they authorize and to make a determination as to whether the analyzed actions would significantly impact the environment. The term "significantly" is defined in 40 CFR 1508.27. If OSMRE determines that the project would have significant impacts following the analysis in the EA, then an Environmental Impact Statement (EIS) would be prepared. If OSMRE determines that the potential impacts would not be significant, OSMRE would prepare a "Finding of No Significant Impact" to document this finding, and, accordingly, would not prepare an EIS.

1.2 Background

Canyon Fuel Company has operated the Skyline Mine (**Figure 1**) since 1981 under Utah DOGM Permit C0070005. Canyon Fuel Company has submitted a modification to their mine plan to the

Figure 1. Project Location



Utah DOGM for the inclusion of Flat Canyon Federal Coal Lease Tract UTU-77114 into their SMCRA permit. Canyon Fuel Company leased Flat Canyon Federal Coal Lease Tract UTU-77114 from the BLM on July 1, 2015.

The Flat Canyon Federal Coal Lease Tract UTU-77114 encompasses approximately 2,692 acres of federal coal reserves of the Wasatch Plateau Coal Field on National Forest System lands within the Manti-La Sal National Forest:

- Township 13 South, Range 6 East, Salt Lake Meridian
 - Section 21, Lots 1-4, E1/2E1/2;
 - Section 28, Lots 1-8, S1/2NW1/4, SW1/4; and
 - Section 33, E1/2, E1/2W1/2, NW1/4NW1/4, SW1/4SW1/4.Consisting of 1430 surface acres of federal coal.
- Township 14 South, Range 6 East, Salt Lake Meridian
 - Section 4, Lots 1-4 S1/2N1/2, S1/2; and
 - Section 5, Lots 1-4 S1/2N1/2, S1/2.Consisting of 1262 surface acres of federal coal.

Privately-owned land consisting of approximately 1100 surface acres (which includes 268 coal acres) are adjacent to the Federal Coal Lease Tract UTU-77114:

- Township 13 South, Range 6 East, Salt Lake Meridian
 - Section 29 E1/2SE1/4, SE1/4NE1/4, S1/2NE1/4NE1/4; and
 - Section 32, E1/2E1/2.
- Township 14 South, Range 6 East, Salt Lake Meridian
 - Section 3, Lots 1 and 2; S1/2NE1/4; E1/2SE1/4; E1/2W1/2SE1/4; NW1/4NW1/4SE1/4;
 - Section 8, N1/2N1/2;
 - Section 9, N1/2N1/2; and
 - Section 10, N1/2NW1/4; NW1/4NE1/4; W1/2NE1/4NE1/4.

The Flat Canyon Federal Coal Lease Tract UTU-77114 and adjacent private lands are collectively the Project Area; therefore, the total area analyzed in this EA is approximately 3,792 acres, with a probable maximum of 47 million tons of coal to be mined over 9 to 12 years. Flat Canyon Federal Coal Lease Tract UTU-77114 is in Sanpete County, Utah, while private surface and coal ownership extends into Emery County. The Skyline Mine surface facilities are in Carbon County.

The U.S. Forest Service, Manti-La Sal National Forest manages the surface resources within their jurisdiction and other uses including, but not limited to, special use permits for outfitting, rights-of-way, grazing permits, and scientific collection permits. Subsurface minerals are managed by the BLM. All of the coal resources are subsurface (1,500 feet underground). The Manti-La Sal National Forest, and the BLM Utah State Office, with OSMRE as a cooperating agency, completed a Final Environmental Impact Statement (FEIS) reviewing the impacts of the federal coal leasing action (US Forest Service, 2002a), the BLM also signed a Record of Decision (ROD) (BLM, 2002) to offer

the lease for sale, and the Forest Service issued a ROD in 2002 (US Forest Service, 2002b) consenting to the leasing action proposed by the BLM.

Canyon Fuel Company subsequently requested that the sale of the lease be delayed and years later the lease was auctioned in July 2015. Because the NEPA review was more than 10 years old, in compliance with the U.S. Forest Service Handbook 1909.15, the Manti-La Sal National Forest reviewed the project and completed a supplemental information report (SIR) (US Forest Service, 2013), which identified the changed conditions, determined that the new information did “not constitute significant new circumstances or information relevant to environmental concerns and bearing” on the decision, and confirmed the Forest Service consent to lease decision. The Forest Service issued a consent letter on February 4, 2015. The BLM also completed a Determination of NEPA Adequacy (BLM, 2015a) under BLM Handbook 1700-1, confirming the 2002 NEPA decision.

1.3 Regulatory Framework and Necessary Authorizations

The following key laws, as amended, establish the primary authorities, responsibilities, and requirements for developing Federal coal resources:

- Mineral Leasing Act of 1920 (MLA)
- National Historic Preservation Act of 1966 (NHPA)
- National Environmental Policy Act of 1969 (NEPA)
- Mining and Minerals Policy Act of 1970 (MMPA)
- Clean Air Act of 1970 (CAA)
- Clean Water Act of 1972 (CWA)
- Endangered Species Act of 1973 (ESA)
- Utah Surface Coal Mining Reclamation Act of 1979
- Federal Land Policy and Management Act of 1976 (FLPMA)
- Federal Coal Leasing Amendments Act of 1976 (FCLAA)
- National Forest Management Act of 1976 (NFMA)
- Surface Mining Control and Reclamation Act of 1977 (SMCRA)

The MLA and FCLAA provide the legal foundation for the leasing and development of federal coal resources. BLM is the federal agency delegated the authority to offer federal coal resources for leasing and to issue leases. The Forest Service has authority to consent to BLM issuing leases on National Forest System lands. If consent is given, the Forest Service identifies conditions (stipulations) for use and protection of the non-mineral resources in the lands subject to leasing.

The MMPA declares that it is the continuing policy of the federal government to foster and encourage the orderly and economic development of domestic mineral resources. In that context, BLM complies with FLPMA and the Forest Service complies with NFMA to plan for multiple uses of public lands and determine if the land is suitable and available for coal leasing and development.

Through preparation of land use plans and/or in response to coal industry proposals to lease Federal coal, BLM complies with NEPA to disclose the potential impacts from coal leasing and development, and also complies with the NHPA, CAA, CWA, ESA, and other environmental laws ensuring appropriate protection of other resources. BLM then makes the lands determined suitable for coal development available for leasing. BLM is also responsible for ensuring that the public receives fair market value for the leasing of federal coal. Once a lease is issued, BLM ensures that the maximum economic recovery of coal is achieved during the mining of federal leases and ensures that waste of federal coal resources is minimized through review and approval of a mine's Resource Recovery and Protection Plan (R2P2) as required under the MLA. BLM implements its responsibilities for leasing and oversight of coal exploration and development under its regulations at CFR, Title 43, Public Lands, Subtitle B, Chapter II, BLM, Department of the Interior, Subchapter C – Minerals Management, Parts 3400 – 3480.

The Forest Service must concur with the approval terms of coal exploration activities, determine the adequacy of the reclamation bond, and ensure coal exploration plans are consistent with lease stipulations. The Forest Service implements its responsibilities for oversight of coal exploration and development following the Forest Service Manual 2800.

SMCRA provides the legal framework for the federal government to regulate coal mining by balancing the need for continued domestic coal production with protection of the environment and society while also ensuring the mined land is returned to beneficial use when mining is finished. OSMRE implements its responsibilities for the MLA and SMCRA under regulations at CFR Title 30 - Mineral Resources, Chapter VII - OSMRE, Department of the Interior, Subchapters A-T, Parts 700-955.

As provided for under SMCRA, OSMRE works with coal producing states to develop their own regulatory programs to regulate coal mining. Once a regulatory program is approved for a state, OSMRE provides oversight. OSMRE has approved Utah DOGM's coal regulatory program, therefore DOGM manages its program under Utah Coal Mining and Reclamation Act (1979). DOGM has the authority and responsibility to make decisions to approve surface and underground coal mining permits and regulate coal mining in Utah under Utah Administrative Code R645-301. The Utah DOGM will review the PAP specifying the mining and reclamation methods to be employed in the permit amendment. Once Utah DOGM finds the PAP administratively complete, the PAP will be submitted to OSMRE for review. The Utah DOGM will continue to work with the permittee to finalize the PAP. After a 30-day public comment period, DOGM will issue their findings and recommendations to OSMRE and, if deemed appropriate, issue the permit to the permittee.

Once the State's findings and recommendations are received, OSMRE will prepare a mining plan decision document (MPDD) in support of its recommendation to the ASLM, who will decide whether or not to approve the mining plan modification and whether or not additional conditions are needed. Pursuant to 30 CFR 746.13, the OSMRE's recommendation shall be based on:

- The PAP including the R2P2;
- Information prepared in compliance with NEPA, including this EA;

- Documentation assuring compliance with the applicable requirements of federal laws, regulations, and executive orders other than NEPA;
- Comments and recommendations or concurrence of other federal agencies and the public;
- Findings and recommendations of the BLM with respect to the R2P2, federal lease requirements, and the MLA;
- Findings and recommendations of the Utah DOGM regarding the PAP and the Utah State program; and
- The findings and recommendations of the OSMRE regarding additional requirements of 30 CFR Chapter VII, Subchapter D.

1.4 Purpose and Need for the Proposed Action

As described at §1502.13 (40 CFR 1500-1508) the purpose and need statement shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the Proposed Action.

1.4.1 Purpose

The purpose of the action is established by the MLA and the SMCRA, which requires the evaluation of Canyon Fuel Company's PAP before Canyon Fuel Company may conduct underground mining and reclamation operations to develop the Flat Canyon Federal Coal Lease Tract UTU-77114. OSMRE is the agency responsible for making a recommendation to the ASLM to approve, disapprove, or approve with conditions the proposed mining plan modification. The ASLM will decide whether the mining plan modification is approved, disapproved, or approved with conditions.

1.4.2 Need

The need for the action is to provide the opportunity for Canyon Fuel Company to exercise its valid existing rights granted under Flat Canyon Federal Coal Lease Tract UTU-77114 to extract coal from their leased federal coal under the MLA of 1920, as amended. The Proposed Action to approve the mining of the coal within Flat Canyon Federal Coal Lease Tract UTU-77114 would also allow mining of private coal reserves, which would be geographically and economically accessible through the federal coal lease and continue operations for approximately 9 to 12 additional years.

1.5 Outreach and Issues Identification

On October 9, 2015, a letter was sent to 62 addresses on a mailing list including adjacent landowners, federal, state, and local agencies, and other individuals and organizations known to be interested in coal mining activities in Carbon, Emery, and Sanpete counties. Legal notices announcing the project and requesting comments were published in the *Emery County Progress* and *Sun Advocate* newspapers on October 13 and 27, 2015, and the *Sanpete Messenger* on October 25 and 29, 2015. The letter and legal notice are in **Appendix A**.

OSMRE developed a project website, which provided additional notice, information, and comment opportunities: <http://www.wrcc.osmre.gov/initiatives/skylineMine.shtm>. The website was activated on October 16, 2015, and is updated periodically as additional information becomes available.

Five letters (WildEarth Guardians, Sierra Club, Sanpete County, Carbon County, Utah Office of the Governor' public Land Policy Coordinating Office) were received (support and opposition), along with a mass mailing of approximately 273 emails largely stating the same opposition to the project. These scoping comments were reviewed and issues identified to be evaluated in this EA.

The primary focus of WildEarth Guardian's letter was air quality and climate change, cumulative effects, threatened and endangered species, impacts on water quality, the social cost of carbon, and the need for an EIS. They also identified several potential alternatives which are described in **Section 2.4.1**. The Sierra Club letter included issues similar to the WildEarth Guardians, along with the Clean Power Plan. Sanpete County provided information on the economic impact Skyline Mine has on the county (jobs, royalty revenue, income, and revenue to the state. Carbon County raised concerns about water resources and the importance of them, economic importance (income, jobs). The mass mailing letters were generated by a WildEarth Guardians website alert and included the same issues as the letter from the WildEarth Guardians. The Governor's Office generally supported the employment and power supply qualities of the proposal and stated concerns about wildlife.

Examples of the comments related to the concerns listed include:

- *Climate Change Impacts, emissions of methane (including from mining activities), carbon dioxide, and other greenhouse gases that have been found to endanger public health and welfare, extent they contribute to global climate change.*
- *516 DM 13, approval of a mining plan requires an environmental impact statement (EIS) where "[t]he environmental impacts of the proposed mining operations are not adequately analyzed in an earlier environmental document covering the specific leases or mining activity," "[t]he area to be mined is 1280 acres or more, or the annual full production level is 5 million tons or more," and "[m]ining and reclamation operations will occur for 15 years or more." 516 DM 13.4(A)(4). Upon review of available information, it appears that all three criteria are met with regards to the proposed mining plan modification.*
- *Use the social cost of carbon to analyze and disclose the climate impacts of the proposal.*
- *[A]nalyze whether the proposed Flat Canyon expansion would interfere with efforts to meet federal greenhouse gas emission reduction targets recently established by President Obama and are in line with the goals of President Obama's Clean Power Plan and Climate Action Plan.*
- *The social cost of carbon must be analyzed.*
- *The greatest environmental impact to Sanpete County is reflected in the Socio-Economic benefit. Currently, Skyline Mine employs over 200 full-time employees which contributes significantly to our economy. This equates to approximately \$14 million annually in wages and benefits for these employees. Therefore, it is imperative that this mine grow and continue to produce coal for the next 9-12 years.*

- *The estimated royalty revenue to Sanpete would be somewhere around \$2 million annually.*
- *[M]aintaining the water management program to protect our watershed would be an issue to consider through the EA process.*
- *[C]oal mining is the historic and economic backbone of Carbon County. Coal mining historically is the biggest supplier of high paying jobs in our county and for many years provided the highest royalty income to our government infrastructure until the last few years when oil and gas production over took it.*
- *The primary impact to wildlife likely to result from mining operations as proposed involves potential reduction of surface water flow associated with and caused by mining subsidence.*

The issues and how they are incorporated into the analysis are shown in in **Table 4** (see Chapter 3).

Chapter 2

Proposed Action and Alternatives

2.1 Introduction

This chapter describes the alternatives considered and analyzed in detail; the Proposed Action and the No Action. In addition, it identifies alternatives considered but eliminated from detailed analysis. This chapter also describes the current operations, which explains the continuation of activities under the Proposed Action and under the No Action.

2.2 Existing Operations

Utah DOGM originally approved the SMCRA permit for the Skyline Mine in 1981 (DNR, 2015). Since then, Skyline Mine has operated an underground mine on leasehold interests on approximately 10,733 acres and mined almost 100 million tons of coal.

The Skyline Mine surface facilities are located in Township 13 South, Range 6 East, Section 13 (see **Figure 1**). Support facilities include a rail loadout, conveyors, coal stockpiles, crushers, waste rock storage, ventilation, and other systems. The existing mine facilities total approximately 125 acres of surface disturbance (**Table 1**). The coal is mined underground and transported by underground conveyor to the surface transfer building (see **Figure 2**).

Table 1. Approved Facilities and Acres of Disturbance

Facility	Disturbed Acres
Loadout	13.86
Portal Yard	42.55
Water tanks, water lines, and well pads	0.60
Conveyor bench	14.18
Waste rock disposal site and road	32.48
South Fork breakout	0.96
James Canyon Buried Power Line	0.30
James Canyon Buried Pipeline	1.60
James Canyon water wells and road	2.95
Winter quarters ventilation facility	7.93
North of Graben Shaft	3.00
Winter Quarters Road	4.90
Total	125.31

Coal is transferred by covered conveyor either to a stockpile or to a silo. Stockpiled coal is eventually transferred via covered conveyor back to the transfer building (all transfers drop points are in buildings with baghouses) then on to the silo. After passing through the silo where waste rock and oversized material is segregated, coal is transferred by conveyor to crushers for crushing as needed. Waste rock from the silo is sent through a covered chute to the nearby waste rock pile. From the crushers, coal is transferred approximately two miles by covered conveyor to a truck

dump or may be transferred directly onto trucks to be transported to customers on the interstate highway system.

Once at the truck dump, a covered conveyor delivers the coal to two silos for screening and short-term storage. From there a covered conveyor takes the coal to a loadout facility for loading onto railcars or trucks and transported offsite to the market. Some coal from the silos could enter the stoker circuit before going to another loadout bin where it is loaded onto truck for transportation to market. The majority of the coal mined is transported by a covered conveyor system to the rail loadout where it is shipped by rail.

Coal from Skyline Mine has typically gone to industrial customers and power plants (Galecki, 2015a). Contracts are generally of short duration. Past contracts are not necessarily a predictor for future shipments. **Table 2** provides information on which electricity generating plants received coal from Skyline Mine within the past six years. The remainder of the coal was shipped to industrial customers. Coal from Skyline is blended and destinations are based on 1) specific characteristics of coal being mined; 2) the characteristics of coal being mined at other Bowie mines; and 3) specific needs of a customer.

Table 2. Annual Shipments to Power Plants from Skyline Mine #3*, 2010-2015

Plant/Year ¹	2010	2011	2012	2013	2014	2015
Colbert	--	--	6,661	--	--	--
Paradise	--	--	--	--	--	--
Shawnee	--	90,986	31,188	--	--	--
Reid Gardner	215,276	83,033	--	--	--	--
Allen Steam Plant	--	--	30	--	--	--
Cumberland (TN)	--	--	6,035	5,152	--	--
Carbon	255,520	327,248	50,618	--	--	--
Hunter	--	--	--	--	3,198	589,214
Intermountain Power Project	--	142,520	104,976	464,205	779,054	909,840
Huntington	--	--	--	--	--	303,216
North Valmy	689,605	854,023	216,615	--	--	193,149
Stockton Cogen	98,964	83,772	--	--	--	--
Stockton Biomass	--	--	--	--	--	--
Mt Poso Cogeneration	128,737	48,452	--	--	--	--
Total Shipped to Power Plants	1,388,102	1,630,034	416,123	469,357	782,252	1,995,419
Total Production From Skyline Mine ²	2,805,489	2,948,091	1,894,468	3,137,170	4,170,162	Data Not Available
Percentage used by Power Plants	49%	55%	22%	15%	19%	NA

Source:

1 (Energy Information Administration, 2016a).

2 (Energy Information Administration, 2016b).

2.2.1 Mining Methods

Mining methods include continuous miner and longwall panel extraction. Longwall panels are generally more than 2,500 feet long, although they vary depending on physical and economic factors. The minimum thickness is six feet. Continuous miners are used in the room and pillar method, where pillars remain permanently to avoid subsidence. The rooms are mined out and the coal removed.

Underground mine access is from five portals, which provide air intake, mining crew transportation, material transportation, and air exhaust. One additional portal is used for conveying coal from the mine. Portals were constructed in 1982.

2.2.2 Topsoil

Topsoil has been removed and stockpiled prior to construction and protected from wind and water erosion and contamination. To prevent suitable topsoil from being wasted or contaminated by spoil or other waste materials, topsoil removal was a separate operation. Stockpiled topsoil will not be removed or otherwise disturbed until required for redistribution operations on a prepared, regraded disturbed area. Revegetation involved the immediate seeding of stockpiled topsoil. The seed mix may need to be altered based on seed availability. Modifications will be based on consultation with Utah DOGM personnel.

2.2.3 Waste Rock Storage

The approved waste rock disposal site is 3.6 air miles from the Skyline Mine. It is an abandoned strip mine pit. Rock wastes are hauled by truck from the portal area and the rail loadout facility. Underground rock waste produced during mining operations is stored there when it cannot be permanently stored underground due to space or the coal content exceeding limits. A very small portion is stored above ground because nearly all is stored underground.

2.2.4 Access and Haul Roads

The Eccles Canyon Road from Highway SR-96 to Highway SR-31 has been included in the State Highway System as Utah State Highway SR-264. Approximately 2.5 miles of paving was completed on the road adjacent to Eccles Creek. The public road was constructed to bypass the mine portals and facilities. It is the responsibility of the Utah Department of Transportation. The Mine Portal Road is approximately 1,200 feet of primary road, surfaced with crushed gravel and tar sands. Other local roads provide access to the mine portals, storage areas, and various buildings.

A truck loop around the storage silos was upgraded from gravel to asphalt in 2009. The loop is accessed from SR-96. The upgrade reduced dust and track-out onto the highway. Subsequently, some asphalt areas were upgraded to concrete when the asphalt deteriorated.

2.2.5 Power Lines

Overhead power lines provide power to the mine and surface facilities. Underground mining operations, conveyors, buildings, and wells are all powered with electricity. Electricity reaches the

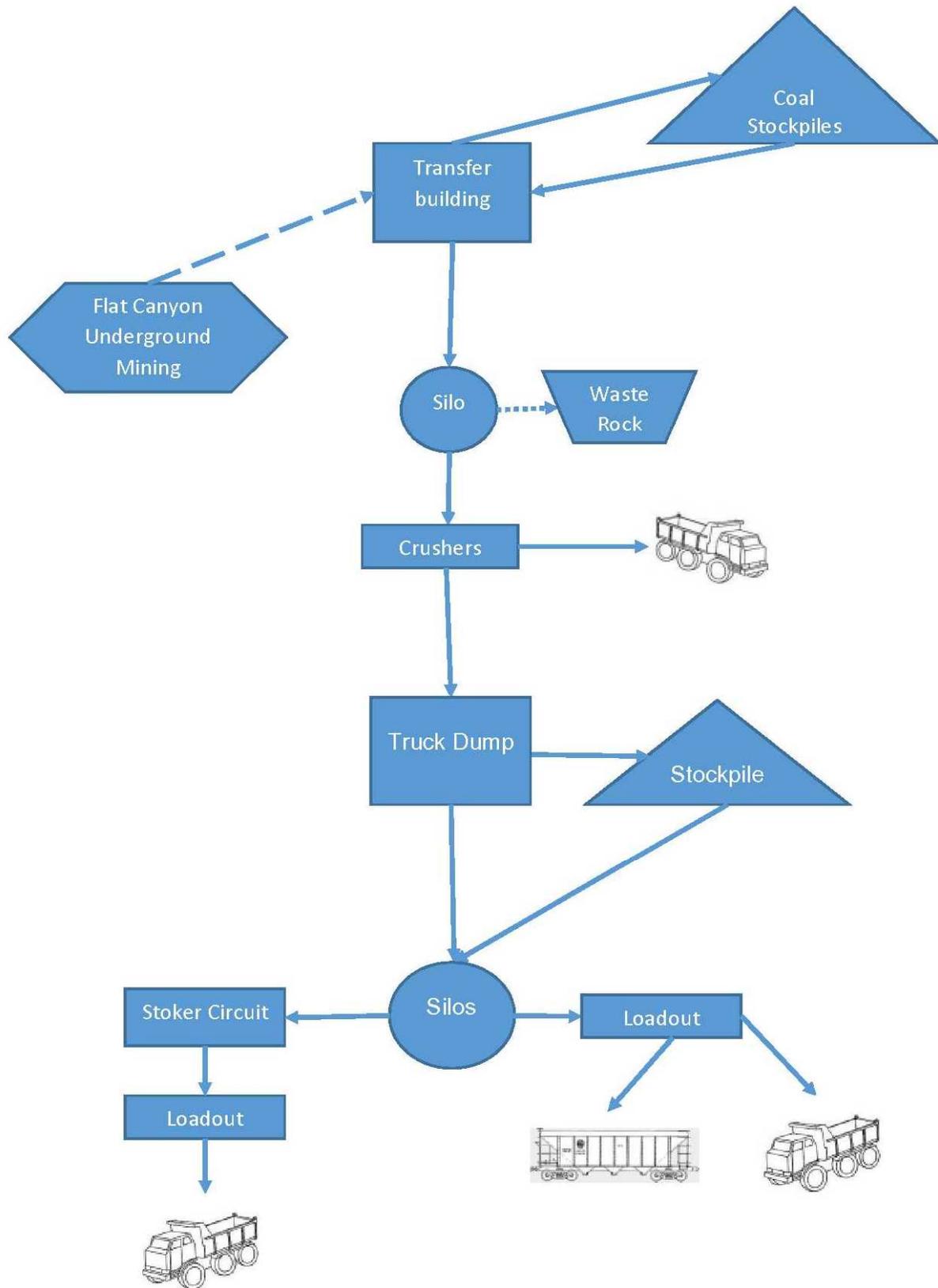
site via overhead power lines. From there, some power is distributed by buried cable. Cables are generally buried in the ditch next to a road.

2.2.6 Ponds, Impoundments, Diversions

Except for small areas, all run-off from disturbed areas is directed to sediment ponds through a collection system of surface ditches, swales, and culverts. No drainage from the Utah State Highway system enters the mine drainage system. Four sediment ponds are used at the mine facilities.

1. The mine site sedimentation pond contains additional volume to adequately treat mine water discharge. This pond is located at the mine site adjacent to the crushing and truck loading station.
2. The coal loadout sediment pond treats surface runoff. Mine water is permitted to be discharged directly to Eccles Creek. This pond is designed to hold a peak run-off from a six-hour 100-year storm event.
3. The rock disposal sediment pond is located at the west end of the disposal site. The design capacity of this pond is for run-off from a 10-year, 24-hour precipitation event, and two years of sediment yield.
4. The Winter Quarters ventilation facility pond is located at the east end of the Winter Quarters ventilation facility site. The volume of this pond provides retention of run-off from a 10-year, 24-hour storm.

Figure 2. Skyline Mine Coal Flow Diagram



When ponds are being cleaned of sediment (at least every three years), storm water discharge is discharged per the Utah Pollutant Discharge Elimination System (UPDES) permit requirements. All discharges from the ponds are permitted to discharge to nearby Creeks.

The three main tributaries to Eccles Creek are diverted under the mine facilities through a system of large culverts. This diversion system is designed to handle the run-off from a 100-year, 24-hour precipitation event. Four seep areas are dewatered with French drains and discharged directly to the diversion culverts. Run-off from surrounding hillsides is intercepted by a system of diversion channels that handle a 10-year, 24-hour storm event. These channels are lined with mature vegetation to reduce erosion and to provide energy dissipation. Channels have been seeded and have well-established vegetation.

2.2.7 Water Source

Mine water is from underground on existing water rights. Underground storage sumps store mine drainage water. The water is used as mine process water within the mine. High or low pH is treated before discharge from the permit area.

2.2.8 Hazardous Materials

No toxic waste materials are anticipated. If any are identified, they will be stored and/or disposed of in accordance with all applicable state and federal regulations.

Diesel fuel, gasoline, and oil are stored in above ground tanks located behind impervious concrete walls which form a containment areas that will hold the entire contents of the single largest tank plus sufficient freeboard to allow for approximately five inches of precipitation.

The explosive magazine (for storing explosive for underground construction and mining activities) is not located near power line, fuel tanks, storage areas, or other possible sources of fire.

Construction material is noncombustible covered with a fire retardant.

According to the Mine and Reclamation Plan, extensive testing of soil material near the coal seams failed to identify the presence of any materials capable of causing acidity or toxicity problems. However, material placed in the waste disposal site will be sampled every 2,000 tons of waste placement and tested for potential toxic or acid forming material. Should acidity or toxicity problems be identified during operations or reclamation, remedial action will be taken in coordination with the Utah DOGM. Testing has not identified acid- or toxin-generating material to date.

2.2.9 Mine Personnel

The mine currently employs approximately 320 people.

2.2.10 Rail Transport

The majority of coal is conveyed to the unit train loadout then shipped via rail. The Denver and Rio Grande Western Railroad Company designed the rail haulage system.

2.2.11 Reclamation

The Reclamation Plan is described in detail in Section 4.1 through Section 4.25 of the Mine and Reclamation Plan and summarized here.

Eventual reclamation of the mine site will satisfy the standards current at the time of reclamation and will be conducted using the most applicable current technology. The mine site will be returned to a wildlife/grazing habitat. It is not intended that all of the disturbed areas will be returned to their original contours or configurations. Steep slopes where returning to their original condition is not practical will be stabilized and revegetated. Stream diversions, other than those in the portal area, will be left in their present channels.

Closure of large diameter openings will be designed to prevent mine drainage from entering surface water. They will be sealed using backfilling with non-combustible material. Mine portals will be broken up and used as backfill at reclamation. Fans and motors will be salvaged.

All surface structures will be removed and salvaged when possible. Silos will be demolished and used as backfill material or will be hauled away. The overland conveyor will be completely removed at reclamation. Steel, exterior siding and conveyor equipment will be salvaged. Disturbed areas will be scarified and a minimum of six inches of topsoil will be placed. Regrading and revegetation of the conveyor route will be performed. Machinery will be removed and concrete stack tube and reclaim tunnel will be demolished and used as backfill in the portal entrances. The foundation for the stack tube and some of the reclaim tunnel will be left in place where cover will avoid interference with final reclamation requirements.

Final contours on rock disposal sites will remain as constructed. Part of the disturbed area will be leveled off and reclaimed to native rangeland as requested by the landowner. The access road to the rock disposal site will remain except the cattle guard will be removed.

Vent shafts and emergency escape shaft will be sealed and backfilled with an engineered fill. The shafts will be backfilled above the pad surface with excess fill to allow for settling. The slope will be sealed with solid, substantial, incombustible materials. Slopes will be recontoured and reseeded.

Solid waste generated by the abandonment will be collected and removed. Concrete footers will be fractured to a minimum of two feet below the surface. Foundations will be broken up and removed, and used for backfill.

At mine closure, benches will be ripped, topsoiled and revegetated. The cut slopes will be reduced to a more gradual grade and will be topsoiled and revegetated. This will return the mine site to the desired wildlife and grazing (rangeland) habitat.

No impoundments, sediment ponds, or treatment facilities will remain. Diversions and culverts which may remain will be renovated to the approved design specification prior to abandonment. Water transmission lines are buried in the highway right-of-way and will remain in place. Ponds will be drained, the sediment will be tested for toxicity and removed for disposal as appropriate, then the pond will be allowed to dry out. When the soil is dry, the railroad loadout pond will be backfilled. The portal pond will be configured as part of stream reclamation. The landowner has requested the Scofield Waste Disposal Site sediment pond be retained.

All highwalls and cutslopes will be reclaimed using geotechnically stable fill slopes with surfaces that have been sufficiently roughened with deep gouging. The bench slopes will be graded back to the approximate original contour at a two horizontal to one vertical slope or shallower upon abandonment with a bulldozer. A geotechnical analysis will be made of the slope at the time of reclamation and design adjustment made as necessary to insure slope stability.

The mine support roads will be reclaimed in the permit area. Culverts and blacktop surfacing material will be removed. Reclamation would then include recontouring, ripping, adding cross drains, water bars, topsoil, and seed.

Vegetation will be established to prevent erosion, to optimize the edge effect and to provide cover. Perennial woody species will be emphasized along with those of proven nutritional value and ability to support wildlife. All areas to be reseeded will be mulched. Various mulches will be used including straw, wood fibers, and excelsior mats.

Fencing, irrigation, and weed control will be used only as needed, according to operation testing results.

2.2.12 Life of Operations

The currently approved mining is anticipated to be complete in 2018.

2.2.13 Project Design Features

2.2.13.1 Measures for the Mine and Reclamation Plan

The Mine and Reclamation Plan was initially approved in 1981 by Utah DOGM and has been updated since. It has requirements and commitments to protect the environment and minimize impacts. Some of them include:

Subsidence Impact Prevention Measures

- Subsidence is monitored.
- Where subsidence could damage surface resources, room and pillar mining methods will be used
- A natural gas pipeline will be protected from subsidence from coal mining. Wherever the pipeline and creek buffer zones coincide, creek buffer zone requirements will take precedence.
- No mining will be conducted beneath Electric Lake.
- Subsidence damage of any surface structures despite the planned subsidence prevention measures will be repaired.
- If it is determined that subsidence causes surface damage or a loss of flow in a perennial stream, the best technology currently available to mitigate the damage will be employed. These measures include backfilling with surrounding native material, incorporating bentonite or

other water-retaining native material into the backfill, or possibly temporarily bypassing/piping flow through impacted areas until mitigation is achieved.

Long-Term Topsoil Stockpile Protection

- A stable surface is provided in an area outside the influence of active operation.
- As a stockpile was completed, it was left in a rough condition to minimize erosion.
- A diversion ditch was dug around these piles to divert runoff from entering the stockpiled area.
- Storage piles were vegetated with quick-growing, soil-stabilizing plants. Revegetation involved the immediate seeding of stockpiled topsoil.
- Signs are posted to protect the stockpiles from accidental use as fill or from other inadvertent material contamination.
- The establishment of noxious plant species is prevented.
- The slope of stockpiles does not exceed 2h:1v.

Protection of Hydrological Balance

- Canyon Fuel Company inspects and maintains diversion channels throughout the site.
- All mine site operations will be conducted in such a way as to minimize potential impacts to surface and subsurface water quality.
- Water originating in or flowing through disturbed areas is collected by a drainage control system and suspended materials allowed to settle in sediment control ponds before being discharged into the natural drainage system.
- Stream buffer zones are designated with signs
- Grease and oil in underground water is removed before the water is pumped out of the mine and discharged.

Fish and Wildlife

- Canyon Fuel Company will minimize disturbances and adverse impacts on fish, wildlife, and related environmental values identified in baseline studies.
- Posted speed limits maintained on the Eccles Canyon road to minimize animal-vehicle collisions. Warning signed indicating animal crossings are installed.
- Power transmission lines were designed and constructed to comply with the guidelines set forth in "Environmental Criteria for Electric Transmission System". Power distribution was designed and constructed in accordance with the REA Bulletin 61-10 "Powerline Contacts by Eagles and Other Large Birds".
- If necessary, a wire fence will be erected and maintained around the perimeter of the portal area to protect grazing stock and wildlife. Other vent shafts and structures will be similarly fenced, covered, or otherwise protected if required.

- Wildlife will be excluded from ponds if necessary.
- No persistent pesticides will be used unless approved by the regulatory authority as part of a reclamation management plan.
- Raptor data will be updated annually in the late spring/early summer.

2.2.13.2 Air Quality

Skyline Mines Approval Order DAQE-AN0092007-03 (UDAQ, 2015b), includes requirements to prepare and operate in accordance with a submitted fugitive coal dust emissions control plan. The requirements are supported by the Utah Administrative Code. The requirements listed in Section II.B.1 (Requirements and Limitations) of Approval Order DAQE-AN0092007-03 are:

- Coal shall be transferred only by enclosed conveyor. Inter-site truck haulage site may be used only during conveyor emergency periods. The direct offsite shipments by truck of coal and waste material combined total shall not exceed 8,000,000 tons per rolling 12-month period. The direct offsite shipments by truck of coal from each individual load-out shall not exceed 4,500,000 tons per rolling 12-month period. [R307-401-8].
- Compliance with the limitations shall be determined on a rolling 12-month total. The owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Records shall be kept for all periods when the plant is in operation. Records, including rolling 12-month totals, shall be made available to the Director or Director's representative upon request and the records shall include the two-year period prior to the date of the request. The records of shipments shall be determined by supervisor monitoring and maintenance of an operations log. The records shall be kept on a monthly basis. [R307-401-8].
- Conveyor transfer points shall contain flaps on entry and discharge ends. [R307-401-8].
- The upper elevation silo (8,000-ton capacity) shall be controlled by two baghouses, Day Model 72RF10 or equivalent. The baghouses shall be operated when coal being transported is dry (less than 4% moisture) or whenever opacity readings exceed 20%. [R307-401-8].
- Two lower elevation silos, rated at 15,000-ton capacity each, shall be controlled by two baghouses, Dynaclone Model 6A or equivalent. The baghouses shall be operated when the coal being transported is dry (less than 4% moisture) or whenever opacity readings exceed 20%. [R307-401-8].
- The Headhouse (rail load out) shall be controlled by one baghouse, Dynaclone Model 7A or equivalent. Storage at train loadout facilities shall be enclosed with venting to fabric filter baghouses. The baghouse shall be operated when the coal being transported is dry (less than 4% moisture) or whenever opacity readings exceed 20%. [R307-401-8].
- Visible emissions from the following emissions points shall not exceed the following values:
 - A. All conveyor transfer points – 20% opacity
 - B. Conveyor drop points – 20% opacity

C. All other points – 20% opacity

Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-401-8]

- Visible emissions from haul road traffic and mobile equipment shall not exceed 20% opacity. Visible emissions determinations for traffic sources shall use procedures similar to Method 9, but the requirement for observations to be made at 15-second intervals over a six-minute period shall not apply. Six points, distributed along the length of the haul road, shall be chosen by the director or his/her representative. An opacity reading shall be made at each point when a vehicle passes the selected point. Opacity readings shall be made no less than one half vehicle length behind the vehicle and no less than one half the height of the vehicles. The accumulated six readings shall be averaged for the compliance value. [R304-401-8].
- The following production limits shall not be exceeded:
 - A. 600,000 tons maximum capacity in the upper elevation stockpile
 - B. 8,000,000 tons maximum throughput for the upper elevation stockpile and lower elevation stockpile combined
 - C. 300 tons maximum capacity in the emergency storage pile.
 - D. 500,000 tons maximum capacity in the lower elevation stockpile
 - E. 8,000,000 tons coal produced per rolling 12-month period. [R307-401-8].
- Compliance with the limitations shall be determined on a rolling 12-month total. The owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Records of production shall be kept for all periods when the plant is in operation. Records of production including rolling 12-month totals, shall be made available to the Director or Director's representative upon request and the records shall include the two-year period prior to the date of the request. The records of production shall be determined by examination of company coal sales records and examination of company throughput records for the points in question. The records shall be kept on a monthly basis. [R307-401-8].
- All unpaved roads and other unpaved operational areas that are used by mobile equipment shall be water sprayed and/or chemically treated to control fugitive dust. The application of water or chemical treatment shall be used. Treatment shall be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition. Records of water treatment shall be kept for all periods when the plant is in operation. The records shall include the following items.
 - A. Date of treatment
 - B. Number of treatments made, dilution ratio, and quantity
 - C. Rainfall received, if any, and approximate amount
 - D. Time of day treatments were made.

[R307-401-8].

- The speed of vehicles on the haul roads shall not exceed 25 mph. [R307-401-8].
- The Eccles Canyon road (State Highway U-96) is paved, and the owner/operator shall clean all coal spills on the road immediately. There shall be no “track out” of fugitive dust from unpaved roads onto the paved haul roads. [R307-401-8].
- The moisture content of the material shall be maintained at a value of no less than 4 percent of water by weight. The moisture content shall be tested, if directed by the Director, using the appropriate ASTM method. [R307-401-8].
- The storage piles shall be watered to minimize generation of fugitive dusts as dry conditions warrant during recovery operations only or as determined necessary by the Director. [R307-401-8].
- The coal fines content of the stored coal shall not exceed 5.1 percent by weight, and that of the haul roads and pile areas shall not exceed 10 percent by weight. The coal fines content shall be determined, if directed by the Director, using appropriate ASTM method. The coal fines content is defined as all material passing a #200 U.S. Standard Sieve. [R307-401-8].
- The sulfur content of any fuel oil burned shall not exceed 15 parts per million by weight as determined by ASTM Method D-4294-89 or approved equivalent. The sulfur content shall be tested, if directed by the Director [R307-401-8].

2.2.13.3 Utah Pollutant Discharge Eliminating Permit UT0023540

The Utah Department of Environmental Quality (UDEQ), Division of Water Quality issued a discharge permit (UT0023450) to Skyline Mine, effective May 1, 2015 and valid through midnight on April 30, 2020 authorizing discharges.

Skyline Mine is permitted to discharge mine water at outfall locations. The permit establishes limits on the discharge from these points into the Eccles Creek, UP Canyon Creek, and Winter Quarters Canyon Creek (all tributaries to the Price and Colorado River Systems (UDEQ, 2015). The permit includes limits on discharge quality, monitoring requirements, sampling methods, testing methods, and reporting requirements.

The permit also specifies the requirements of a storm water pollution prevention plan, which includes Measurements and Controls for minimizing water pollution:

- Good Housekeeping – Good housekeeping requires the maintenance of areas that may contribute pollutants to storm water discharges in a clean, orderly manner. These are practices that would minimize the generation of pollutants at the source or before it would be necessary to employ sediment ponds or other control measures at the discharge outlets. Where applicable, such measures or other equivalent measures would include the following: sweepers and covered storage to minimize dust generation and storm runoff; conservation of vegetation where possible to minimize erosion; watering of haul roads to minimize dust generation; collection, removal, and proper disposal of waste oils and other fluids resulting from vehicle and equipment maintenance; or other equivalent measures.

- Preventative Maintenance – A preventative maintenance program shall involve timely inspection and maintenance of storm water management devices as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems. Where applicable, such measures would include the following; removal and proper disposal of settled solids, in catch basins to allow sufficient retention capacity; periodic replacement of siltation control measures subject to deterioration such as straw bales; inspections of storage tanks and pressure lines for fuels, lubricants, hydraulic fluid or slurry to prevent leaks due to deterioration of faulty connections; or other equivalent measures.
- Spill Prevention and Response Procedures – Areas where potential spills that can contribute pollutants to storm water discharges can occur, and their accompanying drainage points shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up shall be available to personnel.
- Inspections – in addition to or as part of the comprehensive site evaluation required under paragraph 3.a.(4) of this section, qualified facilities personnel shall be identified to inspect designated areas of the facility at appropriate intervals specified in the plan.
- Employee Training – Employee training programs shall inform personnel responsible for implementing activities identified in the storm water pollution prevention plan or otherwise responsible for storm water management at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The pollution prevention plan shall identify periodic dates for such training.
- Record keeping and Internal Reporting Procedures – A description of incidents (such as spills, or other discharges) along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.
- Non-storm Water Discharges:
 - Certification – the plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges such as drainage from underground portions of inactive mines or floor drains from maintenance or coal handling buildings. The certification shall include the identification of potential significant sources of non-storm water discharges at the site, a description of the results of any test and/or evaluation of potential significant sources of non-storm water discharges at the site, a description of the results of any test and/or evaluation, a description of the evaluation criteria or testing method used, the data of any testing

and/or evaluation, and the onsite drainage points that were directly observed during the test. Certifications shall be signed in accordance with Part IV.G.4. of this permit.

- Exceptions – Except for flows from the fire fighting activities, authorized sources of non-storm water listed in Part I.E.2.a. that are combined with storm water discharges associated with industrial activities must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.
- Failure to Certify – If Skyline Mine is unable to provide the certification required (testing or other evaluation for non-storm water discharges), the Director must be notified within 180 days after the effective date of this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe: the procedure for any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water to the storm discharge lines; and why adequate tests for such storm discharge lines were not feasible. Non-storm water discharges to waters of the State that are not authorized by a UPDES are unlawful, and must be terminated.
- Sediment and Erosion Control – The plan shall identify areas that, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization measures to be used to limit erosion and reduce sediment concentrations in storm water discharges. As indicated in paragraph I.E.3. above, SMCRA requirement regarding sediment and erosion control measures are primary requirements of the pollution prevention plan for mining-related areas subject to SMCRA authority. The following sediment and erosion control measures or other equivalent measures, should be included in the plan where reasonable and appropriate for all areas subject to storm water runoff:
 - Stabilization Measures – Interim and permanent stabilization measures to minimize erosion and lessen amount of structural sediment control measures needed, including: mature vegetation preservation; temporary seeding; permanent seeding and planting; temporary mulching, matting, and netting; sod stabilization; vegetative buffer strips; temporary chemical mulch, soil binders, and soil palliatives; nonacidic road surfacing material; and protective trees.
 - Structural measures – Structural measures to lessen erosion and reduce sediment discharges, including; silt fences; earth dikes; straw dikes' gradient terraces; drainage swales; sediment traps; pipe slope drains; porous rock check dams; sedimentation ponds; riprap channel protection; capping of contaminated sources; and physical/chemical treatment of storm water.
- Management of Flow – the plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (other than those as sediment and erosion control measures listed above) used to manage stormwater runoff in a manner that reduces

pollutants in storm water runoff from the site. The plan shall provide that the measures, which the permittee determines to be reasonable and appropriate, shall be implemented and maintained. Appropriate measures may include: discharge diversions; drainage/storm water conveyances; runoff dispersion; sediment control and collection; vegetation;/soil stabilization; capping of contaminated sources; treatment; or other equivalent measures.

2.3 Proposed Action Alternative

The Proposed Action to approve the mining of the coal within Flat Canyon Federal Coal Lease Tract UTU-77114 and make a recommendation to the ASLM to approve the MPDD. The MPDD would authorize Canyon Fuel Company to expand their underground Skyline Mine operations west from the current mining operation. **Table 3** summarizes the activities. No new surface facilities or disturbances are proposed. Access to the coal would be from the existing underground mine.

Table 3. Summary of the Proposed Action

Condition Evaluated	Proposed Action
Federal Coal	Probable maximum of 42
Federal Coal	2,692 coal acres
Federal Surface	2,692 acres
Federal Disturbance Area	0 acres
Private Coal	5 million tons
Private Coal	1,100 coal acres
Private Surface	0 acres
Private Disturbance Area	0 acres
Remaining full production	Approximately 9 to 12

The Proposed Action (**Figure 3**) Alternative would authorize Canyon Fuel Company to expand their underground Skyline Mine operations west from the current mining operations into approximately 2,692 acres of federal coal reserves and to access another 1,100 acres of private coal. Typical depths of cover from the minable coal seam to the surface range from 900 feet to 2,300 feet. The Proposed Action would produce a probable maximum of 42 million tons of coal and extend the life of the Skyline Mine by approximately 9 to 12 years. DOGM has not set a maximum number of tons Skyline Mine can produce annually; however, the current air quality permit, DAQE-AN0092007-03 (DEQ, DAQ, 2015), at Skyline Mine limits the mine to a maximum of 8 million tons per year. Over the last six years, Skyline Mine produced 1.9 to 4.2 million tons of coal a year (**Table 2**). In the future, Skyline anticipates mining 3 to 4.5 million tons of coal per year.

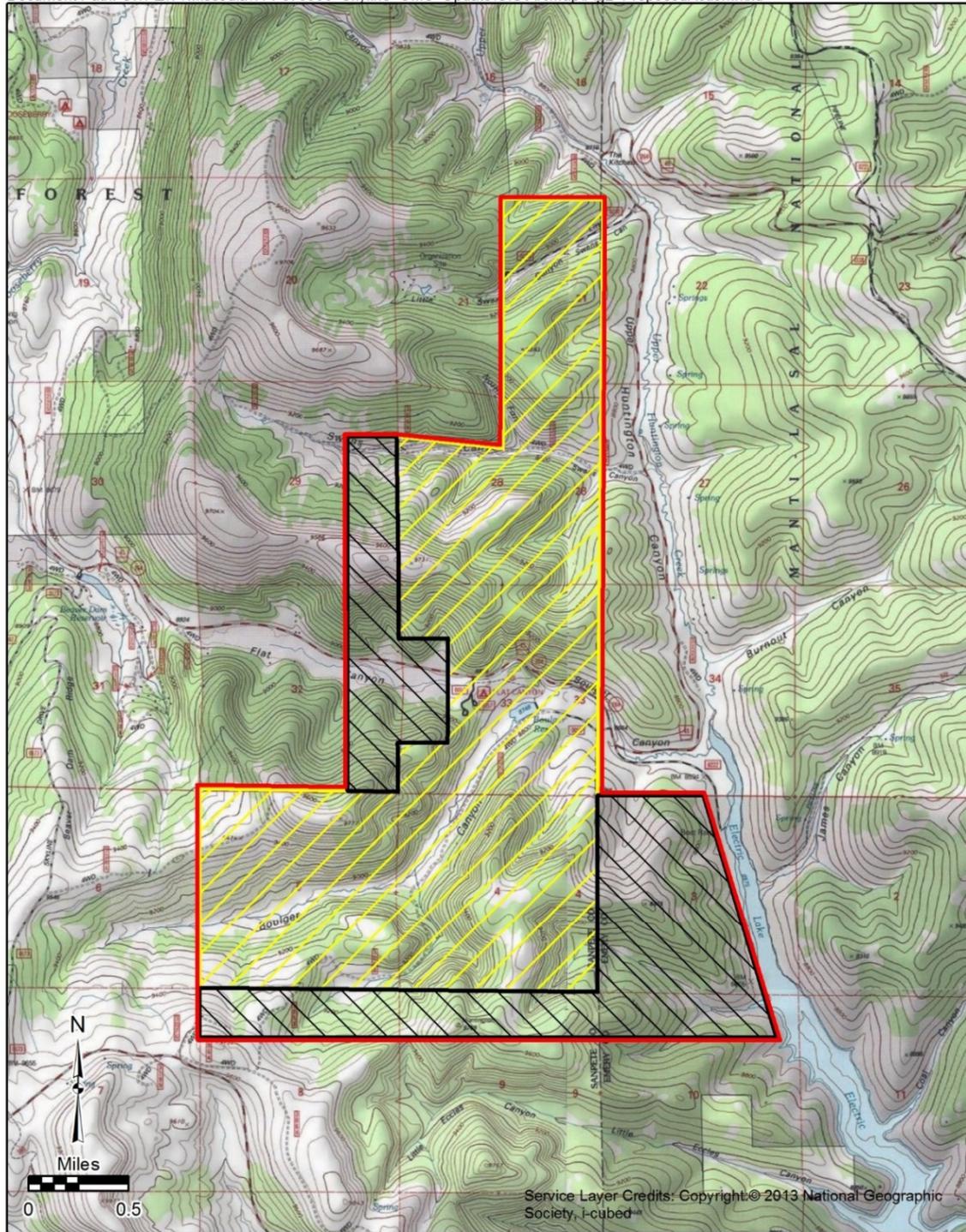
Mine operations would not change as a consequence of the modification and operations would continue to be conducted as described in Section 2.2 Existing Operations.

2.3.1 Topsoil

No new topsoil will be removed or waste rock piles are planned to facilitate Flat Canyon Federal Coal Lease Tract UTU-77114 mining and there would be no impact from acid-or toxic-forming materials.

Figure 3. Proposed Action

Document Path: O:\T-Z\TTMissoula\114-570960 Skyline OMS Update\GIS\ArcMap\Fig2 ProposedAction.mxd



Legend

-  Project Area
-  Federal Surface and Coal Ownership
-  Private Surface and Coal Ownership

Proposed Action
Flat Canyon Mine
Plan Modification EA
Sanpete, Carbon, and Emery Counties, Utah

2.3.2 Waste Rock Storage

Waste rock would be managed as described under the Existing Operations.

2.3.3 Access and Haul Roads

There would be no change in the access or haul roads as described under the Existing Operations.

2.3.4 Power Lines

There would be no change in the power supply or requirements as described under the Existing Operations.

2.3.5 Mine Facilities

There would be no change in the mine facilities as described under the Existing Operations.

2.3.6 Ponds, Impoundments, Diversion

There would be no change in the settling ponds, impoundments, or diversion described under the Existing Operations.

2.3.7 Water Source

There would be no change in the water source described under the Existing Operations.

2.3.8 Hazardous Material

There would be no change in the handling or production of hazardous materials described under the Existing Operations.

2.3.9 Mine Personnel

There would be no change in the mine personnel described under the Existing Operations.

2.3.10 Rail Transport

There would be no change in the rail transport described under the Existing Operations.

2.3.11 Reclamation

There would be no change in the reclamation requirements described under the Existing Operations, except that reclamation would be initiated at the end of the future mining in 9 to 12 years.

2.3.12 Life of Operations

The Proposed Action would extend the mine life by 9 to 12 years (2027 to 2030), depending on the rate of production between 3 and 4.3 million tons per year.

2.3.13 Project Design Features

Design Features listed in Section 2.2.14 from the Mine and Reclamation Plan and the Air Permit would apply, along with the additional measures attached to the Flat Canyon Federal Coal Lease Tract UTU-77114 listed below.

2.3.13.1 Stipulations Attached to Flat Canyon Federal Coal Lease UTU-77114

The Flat Canyon Federal Coal Lease Tract UTU-77114 contains special stipulations. The following stipulations are attached to the executed coal lease (BLM, 2015a).

1. In accordance with Sec. 523(b) of the "Surface Mining Control and Reclamation Act of 1977," surface mining and reclamation operations conducted on this lease are to conform with the requirements of this act and are subject to compliance with Office of Surface Mining regulations, or as applicable the Utah program approved under the cooperative agreement in accordance with Sec. 523(c). The United States Government does not warrant that the entire tract will be susceptible to mining.
2. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory and a paleontological appraisal of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists or qualified paleontologists, as appropriate, and a report prepared itemizing the findings. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified cultural or paleontological resources.

If cultural resources or paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the lessee prior to disturbance shall, immediately bring them to the attention of the appropriate authorities. Paleontological remains of significant scientific interest do not include leaves, ferns, or dinosaur tracks commonly encountered during underground mining operations.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the lessee.

3. If there is reason to believe that Threatened or Endangered (T&E) species of plants or animals, or migratory bird species of high Federal interest occur in the area, the Lessee shall be required to conduct an intensive field inventory of the area to be disturbed and/or impacted. The inventory shall be conducted by a qualified specialist and a report of findings will be prepared. A plan will be prepared making recommendations for the protection of these species or action necessary to mitigate the disturbance.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the Lessee.

4. The Lessee shall be required to perform a study to secure adequate baseline data to quantify the existing surface resources on and adjacent to the lease area. Existing data may be used if such data are adequate for the intended purposes. The study shall be adequate to locate,

- quantify, and demonstrate the interrelationship of the geology, topography, surface and ground water hydrology, vegetation and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.
5. Powerlines used in conjunction with the mining of coal from this lease shall be constructed so as to provide adequate protection for raptors and other large birds. When feasible, powerlines will be located at least 100 yards from public roads.
 6. The limited area available for mine facilities at the coal outcrop, steep topography, adverse winter weather, and physical limitations on the size and design of the access road, are factor which will determine the ultimate size of the surface area utilized for the mine. A site specific environmental analysis will be prepared for each new mine site development and for major modifications to existing developments to examine alternatives and mitigate conflicts.
 7. Consideration will be given to site selection to reduce adverse visual impacts. Where alternative sites are available, and each alternative is technically feasible, the alternatives involving the least damage to the scenery and other resources shall be selected. Permanent structures and facilities will be designed, and screening techniques employed, to reduce visual impacts, and where possible achieve a final landscape compatible with the natural surroundings. The creation of unusual, objectionable, or unnatural land forms and vegetative landscape features will be avoided.
 8. The Lessee shall be required to establish a monitoring system to locate, measure, and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data.
 9. The Lessee shall provide for the suppression and control of fugitive dust on haul roads and at coal handling and storage facilities. On Forest Development Roads (FDR), Lessees may perform their share of road maintenance by a commensurate share agreement if a significant degree of traffic is generated that is not related to their activities.
 10. Except at locations specifically approved by the Authorized Officer, with the concurrence of the Forest Service, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to existing surface structures, and (3) damage or alter the flow of perennial streams. The Lessee shall provide specific measures for the protection of escarpments, and determine corrective measures to assure that hazardous conditions are not created.

Limited subsidence zones consisting of perennial streams in the lease, Boulger Reservoir/Dam, SR-264, and Flat Canyon Campground are specifically approved for subsidence resulting from a single-seam of full-extraction mining. The limited-subsidence zones, where subsidence from a second overlapping seam of full-extraction mining is not approved, will be determined based on the typical angle-of-draw for past operations in the

Skyline Mine Permit Area (23 degrees). "Angle-of-draw" is defined in the FEIS (pg. 4-7). The angle-of-draw will be applied to perennial stream buffer zones that include the natural floodplain and alluvium in perennial drainages, bounded by the first major slope break in the associated canyons. For structures, it will be applied to an area delineated by a 50-foot slope break in the associated canyons. For structures, it will be applied to an area delineated by a 50-foot radius or distance from the major structures that could sustain damage.

The Authorized Officer (AO) can approve full extraction of multiple seams in limited subsidence zones, if the Lessee can provide information, based on actual subsidence data from the tract, that impacts can be tolerated or mitigated. The Forest Service will have to consent to the decision and issue a new record of decision.

11. In order to avoid surface disturbance on steep canyon slopes and to preclude the need for surface access, all surface breakouts for ventilation tunnels shall be constructed from inside the mine, except at specifically approved locations.
12. If removal of timber is required for clearing of construction sites, etc., such timber shall be removed in accordance with the regulations of the surface management agency.
13. The coal contained within, and authorized for mining under this lease, shall be extracted only by underground mining methods.
14. Existing Forest Service owned or permitted surface improvements will need to be protected, restored, or replaced to provide for the continuance of current land uses.
15. In order to protect big game wintering areas, elk calving and deer fawning areas, sage-grouse strutting areas, and other critical wildlife habitat and/or activities specific surface uses outside the mine development area may be curtailed during specific periods of the year.
16. Support facilities, structures, equipment, and similar developments will be removed from the lease area within 2 years after the final termination of use of such facilities. This provision shall apply unless the requirement of Section 10 of the lease form is applicable. Disturbed areas and those areas previously occupied by such facilities will be stabilized and rehabilitated, drainages, reestablished, and the areas returned to an acceptable post mining land use.
17. The Lessee at the conclusion of the mining operation, or at other times as surface disturbance related to mining may occur, will replace all damaged, disturbed, or displaced corner monuments (section corners, quarter corners, etc.) their accessories and appendages (witness trees, bearing trees, etc.), or restore them to their original condition and location, or at other locations that meet the requirements of the rectangular surveying system. This work shall be conducted at the expense of the Lessee, by BLM, to the standards and guidelines found in the Manual of Surveying Instructions, U.S. Department of the Interior.
18. The Lessee, at his expense, will be responsible to replace any surface and/or developed ground water sources identified for protection, that may be lost or adversely affected by mining operations, with water from an alternate source in sufficient quantity and quality to

maintain existing riparian habitat, fishery habitat, livestock and wildlife use, or other land uses (authorized by 36 CFR 251).

19. The Licensee/Permittee/Lessee must comply with all the rules and regulations of the Secretary of Agriculture set forth at Title 36, Chapter 11, of the Code of Federal Regulations governing the use and management of the National Forest System when not inconsistent with the rights granted by the Secretary of the Interior in the license/permit/lease. The Secretary of Agriculture's rules and regulations must be complied with for (1) all use and occupancy of the NFS prior to approval of a permit/operation plan by the Secretary of Interior, (2) uses of all existing improvements, such as Forest Development Roads, within and outside the area licensed, permitted or leased by the Secretary of the Interior, and (3) use and occupancy of the NFS not authorized by a permit/operation plan approved by the Secretary of the Interior.

All matters related to this stipulation re to be addressed to:

Forest Supervisor
Manti-La Sal National Forest
599 West Price River Drive
Price, Utah 84501
Telephone No.: 435-637-2817

The Forest Supervisor is the authorized representative of the Secretary of Agriculture.

20. Notwithstanding the approval of a resource recovery and protection plan by the BLM, lessor reserves the right to seek damages against the operator/Lessee in the event (1) the operator/Lessee fails to achieve maximum economic recovery [as defined at 43 CFR §3480.0-5(21)] of the recoverable coal reserves. Damages shall be measured on the bases of the royalty that would have been payable on the wasted or unrecovered coal.

The parties recognize that under an approved R2P2, conditions may require a modification by the operator/Lessee of that plan. In the event a coal bed or portion thereof is not to be mined or is rendered unminable by the operation, the operator shall submit appropriate justification to obtain approval by the Authorized Officer to leave such reserves unmined. Upon approval by the AO, such coal beds or portions thereof shall not be subject to damages as described above. Further, nothing in this section shall prevent the operator/Lessee from exercising its right to relinquish all or a portion of the lease as authorized by statute and regulation.

In the event the Authorized Officer determines that the R2P2 modification will not attain Maximum Economic Recovery (MER) resulting from changed conditions, the Authorized Officer will give proper notice to the operator/Lessee as required under applicable regulations. The Authorized Officer will order a new R2P2 modification if necessary, identifying additional reserves to be mined in order to attain MER. Upon a final administrative or judicial ruling upholding such ordered modification, any reserves left unmined (wasted) under that plan will be subject to damages as described in the first paragraph under this section.

Subject to the right to appeal hereinafter set forth, payment of the value of the royalty on such unmined recoverable coal reserves shall become due and payable upon determination by the Authorized Officer that the coal reserves have been rendered unminable or at such time that the Lessee has demonstrated an unwillingness to extract the coal.

The BLM may enforce this provision either by issuing a written decision requiring payment of the ONRR demand for such royalties, or by issuing a notice of non-compliance. A decision or notice of non-compliance issued by the lessor that payment is due under this stipulation is appealable as allowed by law.

21. WASTE CERTIFICATION: The Lessee shall provide upon abandonment and/or sealing off a mined area and prior to lease termination/relinquishment, certification to the lessor that, based upon a complete search of all the operator's records for the mine and upon their knowledge of past operations, there has been no hazardous substances per (40 CFR 302.4) or used oil as per Utah State Management Rule R-315-15, deposited within the lease, either on the surface or underground, or that all remedial action necessary has been taken to protect human health and the environment with respect to any such substances remaining on the property. The back-up documentation to be provided shall be described by the lessor prior to the first certification and shall include all documentation applicable to the Emergency Planning and Community Right-to-know Act (EPCRA, Public Law 99-499), Title III of the Superfund Amendments and Reauthorization Act of 1986 or equivalent.
22. ABANDONMENT OF EQUIPMENT: The Lessee/operator is responsible for compliance with reporting regarding toxic and hazardous material and substances under Federal Law and all associated amendments and regulations for the handling such materials on the land surface and in underground mine workings.

The Lessee/operator must remove mine equipment and materials not needed for continued operations, roof support and mine safety from underground workings prior to abandonment of mine sections. Exceptions can be approved by the Authorized Officer (BLM) in consultation with the surface management agency. Creation of a situation that would prevent removal of such material and by retreat or abandonment of mine sections without prior authorization would be considered noncompliance with lease terms and conditions and subject to appropriate penalties under the lease.

23. UNDERGROUND INSPECTION: All safe and accessible areas shall be inspected prior to being sealed. The Lessee shall notify the Authorized Officer in writing 30 days prior to the sealing of any areas in the mine and state the reason for closure. Prior to seals being put into place, the Lessee shall inspect the area and document any equipment/machinery, hazardous substances, and used oil that is to be left underground.

The purpose of this inspection will be: (1) to provide documentation for compliance with 42 U.S.C. 9620 section 120(h) and State Management Rule R-315-15, and to assure that certification will be meaningful at the time of lease relinquishment (2) to document the inspection with a mine map showing location of equipment/machinery (model, type of fluid, amount remaining, batteries etc.) that is proposed to be left underground. In additionally,

these items will be photographed at the Lessee's expense and shall be submitted to the Authorized Officer as part of the certification. The abandonment of any equipment/machinery shall be on a case by case basis and shall not be accomplished unless the Authorized Officer has granted a written approval.

24. All shafts or portals will be filled after mining has ceased or abandoned and all designs will be approved by the AO.
25. Prior to development of the panels that would cause subsidence of the Boulger Reservoir, the Lessee shall submit a plan for approval of mining under the reservoir facilities to the Authorized Officer. This plan shall include, but not be limited to, type of mining, when and how the dam will be taken out of service while undermining and/or subjected to mining-induced acceleration of 0.1g and greater, and what mitigation measures will be taken to place the dam and reservoir back into full service. This plan shall be submitted to and be approved by the Authorized Officer of the BLM, with consent of the surface management agency, and any requirements by the regulatory authority.
26. Prior to development of the panels that would cause subsidence of the Flat Canyon Campground, the Lessee shall submit a plan for approval to conduct mining under the campground. This plan shall include but not be limited to type of mining, when and how the Flat Canyon Campground will be taken out of service and what mitigation measures will be taken to place the Flat Canyon Campground back into full service. The Plan shall be submitted to and be approved by the Authorized Officer of the BLM, with the consent of the surface management agency, in addition to any requirements required by the regulatory authority.
27. The Lessee shall submit a plan for monitoring the gradient of the perennial streams within the lease and the associated effects to aquatic ecosystems and wetlands. The plans shall also include measures for mitigating detrimental effect discovered during monitoring. The plans shall be submitted to and be approved by the Authorized Officer of the BLM, with consent of the surface management agency in addition to any requirements by the regulatory authority, prior to mining.
28. The Lessee shall immediately notify the Authorized Officer of any seismic events that trigger a Richter scale reading in excess of 3.0.

2.4 No Action

Under the No Action, the MPDD to mine Flat Canyon Federal Coal Lease Tract UTU-77114 would not be prepared by OSMRE and therefore ASLM approval would not occur. Although DOGM has already approved the permit revision associated with the Proposed Action, without ASLM approval, DOGM's permit would revert to the previous permit.

The federal coal reserves in the Flat Canyon Federal Coal Lease Tract UTU-77114 would not be recovered. Mining would continue as described in Section 2.2 until available coal reserves are mined out in 2018 (Galecki, 2015b). Longwall panel development would cease within approximately one year and underground mining would cease completely within approximately two years. The

state and private coal reserves to the south and west would not be accessible. While a portion of these state and private reserves might be reached by reorientation, the accessible coal would not be economically mineable. Coal resources would be economically isolated and sterilized from use for the public need and the mine would close prematurely. Reclamation would last two years after closure. Monitoring of the reclamation would continue for at least the 10-year bond period.

Under the No Action, removal of coal, air quality impacts or any other effects associated with mining operations in the Flat Canyon Federal Coal Lease Tract UTU-77114 would not occur.

2.4.1 Alternatives Considered but Eliminated from Detailed Analysis

This section discusses alternatives that were considered but eliminated from detailed analysis. Reasons that an alternative might not be considered in detail, in accordance with the Council on Environmental Quality's (CEQ) NEPA implementing regulations (40 CFR 1502.14), are:

- Ineffective (does not respond to the purpose and need);
- Technically or economically infeasible (consider whether implementation of the alternative is likely given past and current practice and technology);
- Inconsistent with the basic policy objectives for the management of the area (such as, not in conformance with land use plans);
- Remote or speculative;
- Substantially similar in design to an alternative that is analyzed; or
- Substantially similar in impacts to an alternative that is analyzed.

Alternatives proposed during public outreach are described briefly below, along with the reasons they were eliminated from detailed analysis.

2.4.1.1 Alternative Mining Levels

Alternatives that would limit the amount of coal or acreage to be mined to lower levels than are currently proposed were suggested to reduce the impacts on air quality and climate change.

These alternatives were not considered in detail because they would not meet the purpose and need (see Section 1.4) and would be inconsistent with the MLA requirement to maximize recovery by achieving MER of this energy resource (43CFR§ 3480.0-5 (21)). OSMRE's purpose and need is to evaluate Canyon Fuel Company's proposed mining plan modification submitted in accordance with the federal coal lease granted to Canyon Fuel Company.

2.4.1.2 Low or No Pollutant Emitting Equipment

This proposed alternative would require that equipment used for mining produce less or no emissions (natural gas-fired vehicles and machinery, and electric machinery powered by solar or other renewable energy sources), and establish equipment maintenance standards to minimize emissions to the maximum extent practicable.

Mining at Skyline Mine has the potential to emit at the levels identified in **Section 3.3** and **Section 4.3**, which would not result in ambient quality concentrations exceeding the federal or state air quality standards.

The Skyline Mine currently uses all electric production units underground. The shuttle cars and longwall system are driven by electricity while transport vehicles are diesel, managed by a stringent exhaust filtering replacement program. Ventilation is managed by both forced exhausting fans, and passive exhaust portals. Dust and other airborne particulates are managed using water sprays which sometimes include a binding additive. Since no significant impacts on air quality are anticipated, an alternative that requires low or non-polluting equipment is eliminated from detailed analysis as it would have impacts similar to the Proposed Action.

2.4.1.3 Other Air Quality Mitigation to Limit or Reduce Other Greenhouse Gas (GHG) Emissions

Other alternatives were suggested that:

- Require stronger emission limits at power plants that use coal from the Skyline Mine;
- Eliminate nitrogen dioxide (NO₂) emissions during any blasting operations (including an alternative that prohibits cast blasting to prevent orange clouds from forming);
- Require a compensatory reduction in emissions for any and all emissions that would continue or increase as a result of the proposed coal lease by securing commitments from oil and gas operators in the region to reduce their emissions;
- Require the use of low carbon fuels for the operation of any heavy machinery; or
- Require that the Skyline Mine use renewable energy for power.

These alternatives were eliminated from detailed analysis because OSMRE does not have the regulatory authority to require electricity generating plants to reduce emissions and the emissions are regulated by states or countries where the plants are located.

The Skyline Mine is an underground mine and does not use “cast blasting”. Alternatives to prohibit cast blasting are unnecessary. Emissions from mining underground are released to the atmosphere through the mine’s ventilation system.

Requiring additional emission control measures for those that use the Skyline Mine coal and nearby oil and gas operations would be outside the scope of OSMRE's authority. Further, such an alternative would not be reasonable, as the Skyline Mine must comply with the requirements of the CAA and obtain approval of an air quality permit from the UDEQ- DAQ, under the requirements of the Utah Air Conservation Act (Title 19, Chapter 2 of the Utah Code). The air permit incorporates measures that address the issues raised.

2.4.1.4 Offsite Mitigation or Compensation

Comments suggested that there should be mitigation requirements, such as offsite mitigation, mitigation that requires compensation, or offset carbon dioxide (CO₂) emissions from the Skyline

Mine and the power plants fueled with coal from the Skyline Mine. Offsite mitigation could include developing a comparable amount of renewable energy.

The Proposed Action has the potential to emit CO₂ at the levels identified in **Section 3.3** and **Section 4.3**. CO₂ emissions from the Proposed Action are estimated at 14,893 metric tons per year, well below the U.S. Environmental Protection Agency's (EPA) Final Mandatory Reporting of Greenhouse Gases Rule threshold of 25,000 metric tons per year of carbon dioxide equivalent (CO₂e) (CEQ, 2014).

Because no significant impacts are predicted from CO₂ emissions attributed to the Proposed Action, an alternative that requires compensatory mitigation is eliminated from detailed analysis.

Chapter 3

Affected Environment

3.1 Introduction

This chapter describes the current condition of resources that could be affected by the Proposed Action. **Table 4** lists the issues, along with how they are incorporated into the analysis or otherwise addressed.

The summary of cumulative impacts in **Table 4** refers to Table 2.1 in the Forest Service's 2002 ROD (US Forest Service, 2002b). The analysis of the impacts of the selected alternative included surface disturbance, vent shafts, and exploration holes. These activities were either completed or no longer proposed and are not included in the Proposed Action or No Action analyzed in this EA. **Table 4** includes the summary of cumulative impacts from the mining of the Flat Canyon Federal Coal Lease Tract UTU-77114 identified in the 2002 ROD, but excludes the impacts from surface disturbance, vent shaft, or exploration drilling.

The CEQ's definition of a cumulative impact is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time" (40 CFR 1508.7). Therefore, if a project would have no direct or indirect effect, it would not have any cumulative effect.

Table 4. Issue Disposition

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
Air Quality and Climate Change	FEIS Section 2.4; SIR pages 5-8	Not Applicable	Not Applicable	Yes Air Quality and Climate change analysis is discussed in EA Sections 3.3, 4.3 and 5.3.	On July 13, 2015, the UDEQ approved the modification to Skyline Mine’s air quality permit (DQAE-AN0092007-03) to increase haulage of coal and add staking tube (DEQ, DAQ, 2015).
Cultural Resources	FEIS Section 3.1.12	FEIS Section 4.1.11	No impact from mining, subsidence impacts avoided through “subsidence protection zones”	No	The 2002 ROD indicates little potential for damage from subsidence Cracks would heal in one or two years. The State Historic Preservation Office (SHPO) concurred with a determination that no historic properties would be affected (Utah SHPO, 2001). There would be no direct or indirect impacts and therefore, no cumulative impact on cultural resources.
Environmental Justice	Not Addressed	Not Addressed	Not Addressed	Yes Sections 3.4, 4.4, and 5.2.3	There are no environmental justice populations present in the Project Area or vicinity and is not further analyzed in this EA. No minority or low-income populations ¹ are located in Sanpete County; minority population is 14.1 percent (%) (white alone) according to the 2014 (US Census Bureau, 2014).

¹ Minority population: Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. Low Income annual statistical poverty thresholds from the Bureau of the Census’ Current Population Report. http://www3.epa.gov/environmentaljustice/resources/policy/ej_guidance_nepa_ceq1297.pdf

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
					<p>The poverty level is 15.7 percent (2009-2013). Emery County's minority population in 2013 was 3.4 percent (white alone) according to the Census Bureau and the poverty level was 10.0 percent (2013) (US Census Bureau, 2014). Power stations supplied by Skyline Mine provide relatively low cost electrical power to populations that include low-income populations. As there are no direct or indirect impacts on environmental justice populations, there would be no cumulative impacts.</p>
Farm Lands (prime or unique)	Not Addressed	Not Addressed	NA	No	<p>No prime or unique farm lands occur in the vicinity (NRCS, 2014) and therefore there would be no direct, indirect, or cumulative impacts on farmlands.</p>
Fish (Aquatic Wildlife)	FEIS Section 3.1.8	FEIS Section 4.1.7	FEIS 4.1.7, pg. 4-56; Impacts considered: surface disturbance and logging, human uses. Cumulative impacts study area would not change.	No	<p>The FEIS found there would be no direct impacts on fish populations from subsidence and mine water discharge. Tributaries to Upper Huntington Creek provide spawning habitat for cutthroat trout, and there is low probability that subsidence will alter drainages. Rainbow trout are stocked yearly in Boulger Reservoir. The 2002 FEIS determined no impact on Boulger Reservoir from subsidence and no cumulative impacts on fish. Indirectly, coal combustion can affect fish. Coal combustion facilities are regulated to minimize emissions that adversely affect fish. Due to the representative</p>

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
					nature of the emissions analysis for coal combustion in this EA, OSM determined that indirect impacts to biological and water resources were not quantifiable, and therefore could not be analyzed, as those resources depend on site-specific landscape and ecosystem characteristics that would be different for every location.
Wildlife	FEIS Section 3.1.8 SIR (pgs 4-5)	FEIS Section 4.1.7	Cumulative impacts study area would not change. There are no new past, present or reasonably foreseeable actions that have or would cause additional cumulative impacts.	No	The FEIS found impacts from underground mining or subsidence would be negligible, and cited monitoring requirements that would be implemented. Indirectly, coal combustion can affect wildlife resources. Coal combustion facilities are regulated to minimize emissions that adversely affect wildlife. Due to the representative nature of the emissions analysis for coal combustion in this EA, OSM determined that indirect impacts to biological and water resources were not quantifiable, and therefore could not be analyzed, as those resources depend on site-specific landscape and ecosystem characteristics that would be different for every location.
Floodplains	NA	ROD findings of consistency with Other Laws and Regulations, pages 20 and 21.	NA	No	The ROD found that floodplains would not be affected. Proposed activities would not alter natural floodplains; Project Area would be within Zone C (low risk). The selected alternative will be in compliance with Executive Order

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
					11988 (Floodplain Management) and therefore, there would be no direct, indirect, or cumulative impacts
Geology	FEIS Section 3.1.2	FEIS Section 4.1.2; addressed surface disturbance, subsidence, and seismicity	FEIS Section 4.1.2, pg. 4-20; Cumulative impacts study area would not change. There are no new past, present or reasonably foreseeable actions that have or would cause additional cumulative impacts.	Yes Section 3.2 and Section 4.2.	Geology is carried forward for informational purposes and for supporting related resources. Geology analysis is discussed in EA
Grazing Management	FEIS Section 2.4	FEIS Section 2.4	FEIS Section 2.4	No	No range improvements were identified that could be damaged by subsidence and a no impact determination was made on forage in the 2002 FEIS.
Hazardous Materials	FEIS Section 4.1.4, 4.1.5	FEIS Section 4.1.5; ROD p. 11	FEIS pg. 4-43	No	The potential for surface and groundwater contamination is unlikely as Canyon Fuel Company is required to obtain approval from regulatory agencies to abandon equipment underground and given present evidence that there would be no connection between equipment and surface and groundwater; low permeability of rock layers exposed in Project Area. Canyon Fuel Company is required to remove all fluids, batteries, etc. prior to abandoning any approved equipment underground and therefore, there would be no direct, indirect, or cumulative impacts.
Land Use Authorization	FEIS Section	FEIS Section	FEIS Section	No	Mining-induced subsidence and seismicity would not damage Beaver

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
	2.4 (Issues Not Considered)	2.4 (Issues Not Considered)	2.4 (Issues Not Considered).		Dams Reservoir or Electric Lake, and their associated dams as neither dam would be mined-under or subsided. The Maximum Credible Event of Richter 3.45 would not produce ground shaking sufficient to damage facilities or dams at Beaver Dams Reservoir or Electric Lake. Additionally, the BLM has no plans to develop the lease area so no conflict would develop with a BLM Withdrawal in the lease area.
Migratory Birds	FEIS Section 3.1.8	FEIS Section 4.1.7	Cumulative impacts study area would not change. There are no new past, present or reasonably foreseeable actions that have or would cause additional cumulative impacts.	No	The 2002 FEIS found impacts from underground mining or subsidence would be negligible, and cited monitoring requirements that would be implemented.
Native American Cultural Concerns	Not Addressed	Not Addressed	Not Addressed	No	In 2001, the Hopi Tribe (The Hopi Tribe, 2001) and Utah SHPO concurred that no historic property resources were present. Government-to-Government consultation between OSMRE and the Hopi and Southern Ute Tribes, and Santa Clara Pueblos under Section 106 of the Historic Resources Preservation Act for this project are ongoing.
Noise	Not identified as an issue during scoping, therefore; not addressed.	ROD pg. 12.	Not identified as an issue during scoping, therefore; not addressed.	No	All mining production would be underground. Current levels of noise would continue, however, there would be no additional noise generated on the surface. There are no noise-sensitive receptors (such as schools or hospitals)

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
					in the Project Area or within a distance which would warrant analysis. The nearest school is at 13 miles away from the mine and separated by mountains. The nearest greater sage-grouse lek is approximately 10 miles away and would not be affected by mine-related noise. ROD states, "there would be no long-term noise that would displace [wildlife] use." There would be no direct or indirect impacts, and therefore no cumulative impacts.
Noxious Weeds, Invasive and Non-native Species	FEIS Section 2.4	FEIS Section 2.4	FEIS Section 2.4	No	Requirements for the prevention and spread of noxious weeds and reclamation are included in stipulations and Utah DOGM permit. There would be no surface disturbance associated with mining of the Flat Canyon Coal Lease Tract. UTU-77114, therefore there would be no direct, indirect, or cumulative impacts.
Paleontological Resources	FEIS Section 3.1.12	FEIS Section 4.1.11	FEIS 4-73; potential for unanticipated discoveries; protection measures in place; No change in cumulative impacts study area and no new past, present or reasonably foreseeable actions that have or would cause additional cumulative impacts.	No	Fossils of bone material are rarely found in the coal seams. No significant sites with Cretaceous plants and animals, including dinosaurs have been identified in the Project Area. No discoveries of Pleistocene mammal remains have been made in the Project Area; although it is likely they occur within the canyon bottoms and floodplains in the Project Area. Therefore, there would be no direct, indirect, or cumulative impacts.

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
Recreation	FEIS Section 3.1.9	FEIS Section 4.1.8	FEIS 4.1.8, pg. 4-62; Impacts considered: human use of reservoirs, oil and gas development	No	The 2002 FEIS evaluated subsidence and determined no impact on Boulger Reservoir or Flat Canyon Campground due to subsidence and subsidence prevention zones.
Social and Economic Values	FEIS Section 3.1.14	FEIS Section 3.1.13	FEIS pg. 4-74; Impacts considered: employment, mining economy in Utah.	Yes Sections 3.4, 4.4, and 0	Updated information is provided for revenue, employment, and coal value.
Soils	Not Addressed	Not Addressed	Not Addressed	Yes Sections 0, 0 and 5.2.6	No surface disturbance is proposed. The 2002 FEIS noted subsidence may produce a zone of flexure resulting in minor surface cracking that is followed by a zone of compression where fractures close and heal. Fractures may occur in areas with little lateral constraint, such as ridges. Of the total area mined at Skyline, less than 0.5 percent produced tensile factures. Section 2.2 discusses existing disturbance. Therefore, there would be no direct, indirect, or cumulative impacts
Threatened or Endangered, Candidate, and Proposed Wildlife and Plants	FEIS Sections 3.1.7 and 3.1.8; SIR pages 4-5.	FEIS Sections 4.1.6 and 4.1.7; SIR pages 4-5.	Not Addressed	No	There would be no impact on threatened and endangered species. The Forest Service SIR identified no suitable habitat within the Flat Canyon Federal Coal Lease Tract UTU-77114 for three candidate species added to the USFWS County list since the 2002 FEIS. There would be no impact on threatened and endangered species. Indirectly, coal combustion can affect threatened, endangered, candidate, or

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
					<p>proposed wildlife or plants. Coal combustion facilities are regulated to minimize emissions that adversely affect these species. Due to the representative nature of the emissions analysis for coal combustion in this EA, OSM determined that indirect impacts to biological and water resources were not quantifiable, and therefore could not be analyzed, as those resources depend on site-specific landscape and ecosystem characteristics that would be different for every location.</p>
<p>Rare Plants, Fish, and Wildlife, Including greater sage-grouse</p>	<p>FEIS Sections 3.1.7 and 3.1.8; SIR pages 4-5.</p>	<p>FEIS Sections 4.1.6 and 4.1.7; SIR pages 4-5.</p>	<p>NA</p>	<p>Yes Greater sage-grouse is discussed in Sections 3.5, 4.5, and 5.2.4.</p>	<p>There would be no impact on sensitive species (ROD, Attachment 3, pages 12-13). For Forest Service sensitive species, the SIR identified the western boreal toad as the only species with suitable habitat within the lease area. The SIR concluded that the original amphibian analysis was complete in the FEIS and no additional analysis was necessary. Indirectly, coal combustion can affect rare plant, fish, and wildlife. Coal combustion facilities are regulated to minimize emissions that adversely affect these species. Due to the representative nature of the emissions analysis for coal combustion in this EA, OSM determined that indirect impacts to biological and water resources were not quantifiable, and therefore could not be analyzed, as those resources depend on site-specific landscape and</p>

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
					ecosystem characteristics that would be different for every location.
Inventoried Roadless Area	FEIS Section 2.4; SIR page 3.	FEIS Section 2.4; SIR page 3.	FEIS Section 2.4; SIR page 3.	No	There would no direct, indirect, or cumulative impacts on Inventoried Roadless Areas or Unroaded Undeveloped Areas because none are located within the Project Area.
Transportation and Access	FEIS Section 3.1.11	FEIS Section 4.1.10	FEIS pg. 4-68; Impacts considered: other uses on SR 264 and SR 31. No change in cumulative impacts study area or new past, present or reasonably foreseeable actions that have or would cause additional cumulative impacts	No	The 2002 FEIS disclosed that minor cracks from subsidence could occur on State Route (SR) 264 that would need repair. On National Forest and private roads, larger cracks are expected. These cracks would also require repair by lessee.
Vegetation	FEIS Section 3.1.7	FEIS Section 4.1.6	FEIS Section 4.1.6; Impacts considered: surface disturbance, grazing, human uses. No change in cumulative impacts study area or new past, present or reasonably foreseeable actions that have or would cause additional cumulative impacts.	No	There would be no impact on vegetation. Due to surface disturbance proposed.
Visual Resources	FEIS Section 3.1.10	FEIS Section 4.1.9	FEIS pg.4-66: considered additional private development, oil and gas. No change in cumulative impacts study area or new past, present or	No	Visual quality would not be affected. There would be no apparent visible impacts of mining-induced subsidence and seismicity. Impacts from past mine development are consistent with visual quality objectives.

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
			reasonably foreseeable actions that have or would cause additional cumulative impacts		
Water Quality, Surface/ Groundwater	FEIS Sections 3.1.5 and 3.1.6; SIR page 3.	FEIS Sections 4.1.4 and 4.1.5; SIR pages 3 -4.	FEIS Section 4.1.4; Impacts considered: Skyline Mine construction, water diversions and changes in discharge, grazing pressure on riparian; subsidence impacts on surface flows, dewatering of deep-perched aquifers. No change in cumulative impacts study area or new past, present or reasonably foreseeable actions that have or would cause additional cumulative impacts	Yes Sections 3.5, 4.6, and 5.2.5.	Impacts on water determined in the 2002 FEIS included mine water discharge, possible subsidence in Huntington drainage, possible interception of groundwater and contamination from oils and other fluids. Indirectly, coal combustion can affect water quality. Coal combustion facilities are regulated to minimize emissions that adversely affect water quality. Due to the representative nature of the emissions analysis for coal combustion in this EA, OSM determined that indirect impacts to biological and water resources were not quantifiable, and therefore could not be analyzed, as those resources depend on site-specific landscape and ecosystem characteristics that would be different for every location.
Water Rights	Not Addressed	FEIS Section 4.1.5, pg. 4-40	NA	No	The Proposed Action would not affect groundwater or surface water flow and therefore no impacts on water rights. There would be no impact on water rights. Water rights in the Project Area are addressed under Water Replacement Rules. Utah Code 40-10-18 requires the mine operator to "promptly replace any state

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
					appropriated water in existence prior to the application for a surface coal mining and reclamation permit."
Wetlands/ Riparian Zones	FEIS Section 3.1.7	FEIS Section 4.1.6		No	The 2002 FEIS noted subsidence of perennial stream channels would not occur with the possible exception of the Cunningham Drainage. No impacts to riparian vegetation in the vicinity of the stream channel are anticipated. Most of the springs that maintain wetlands are located adjacent to the valley bottom and would be within the subsidence protection zone. No adverse impacts to wetlands are anticipated. Indirectly, coal combustion can affect wetlands and riparian areas. Coal combustion facilities are regulated to minimize emissions that adversely affect wetlands and riparian areas. Due to the representative nature of the emissions analysis for coal combustion in this EA, OSM determined that indirect impacts to biological and water resources were not quantifiable, and therefore could not be analyzed, as those resources depend on site-specific landscape and ecosystem characteristics that would be different for every location.
Wild and Scenic Rivers	Not Addressed	Not Addressed	Not Addressed	No	Wild and Scenic Rivers would not be affected because no Wild and Scenic rivers occur in or near the Project Area. Virgin River, at a distance of 175 miles to the southwest, is closest Wild and Scenic River.

Resource	Affected Environment (FEIS or SIR Reference)	Environmental Consequences (FEIS, SIR, or ROD Reference)	Cumulative Impacts (FEIS or ROD Table 2.1 Selected Alternative)	Brought Forward for Further Analysis	Rationale for Elimination, Summary of Impacts from ROD or EA Section Number
Wilderness/ Wilderness Study Areas	Not Addressed	Not Addressed	Not Addressed	No	Wilderness or Wilderness Study Areas are not present within or near the Project Area. Mt. Nebo Wilderness Area, located 25 miles to the northwest, is the closest wilderness area.

3.2 Topography and Geology

The Flat Canyon Coal Lease Tract UTU-77114 lies in the interior of the Wasatch Plateau. The Wasatch Plateau has been incised by deep canyons shaped by glaciers and by wind and water erosion. Huntington Canyon drains the eastern flank of the Wasatch Plateau. Upper Huntington Creek along the eastern project boundary forms the headwaters of Huntington Canyon, trending north-south (see **Figure 4**). The Flat Canyon Coal Lease Tract UTU-77114 lies on the western slope of Upper Huntington Creek and the tributaries that drain the west slope of Huntington Canyon. The major tributaries generally trend east-west.

Previous mining includes the Skyline Mine with surface facilities located to the east in Eccles Canyon (see **Figure 4**, single seam mining shown for simplicity). Coal was extracted from underground using the longwall mining method. Mining occurred in three separate coal seams that partially overlap. Historically, two sets of longwall mining equipment operating were used concurrently in separate mine levels. However, current production is from a single longwall face operating in the Lower O'Conner A Seam of the Skyline No. 3 Mine (DNR, 2015). See **Figure 6** for a generalized columnar section for the Flat Canyon Lease Tract UTU-77114.

Full extraction longwall mining results in failure of the immediate roof strata, leading to fracture and flexure of the overburden rocks progressing upwards and resulting in surface subsidence. The degree of subsidence varies with the mining layout, geology, thickness of extraction, and amount and type of overburden. With the overburden depths at the Skyline Mine, flexure of the rock strata occurs near the surface due to differential subsidence, generally without fracture. However, in some isolated areas, tension fractures can open, such as where massive rock beds are located near the surface or above stacked barrier pillars.

Subsidence produces a zone of flexure where tension can sometimes result in minor cracking of the surface that soon close and rapidly heal. Permanent tensile zones that produce fractures may take longer to heal. Of the total area mined at Skyline Mine (10,733 acres), less than 0.5 percent of the area has produced tensile fractures. Additionally, the overburden depth in this subsided area was as low as 600 feet. **Figure 4** shows past areas of subsidence, along with the current Project Area and previously mined areas of Skyline Mine. Similar conditions are not present in the Project Area. The depth of overburden is greater than 1,000 feet.

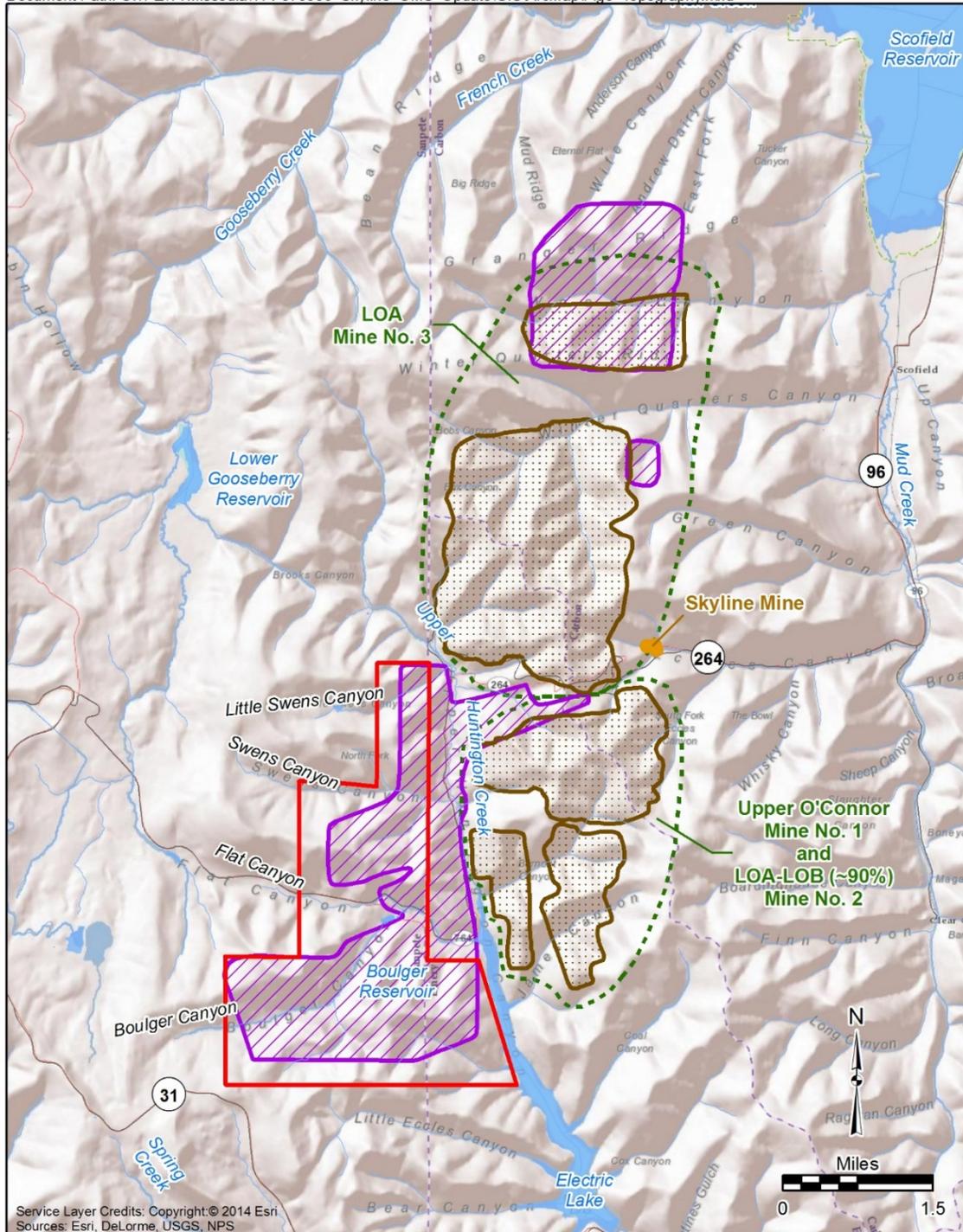
No major slope failures have been observed at Skyline Mine (BLM, 2002).

Mining-induced seismicity has also been experienced as a direct result of longwall mining at Skyline Mine. Seismicity, the propagation of measurable earthquake waves, results from collapsing ground.

A study of this phenomenon was carried out from 1986 to 1996 while the Skyline Mine was operating in the northern section of the current mining area (Arabasz, et al., 1997). Results of the study indicated a very strong correlation between mining induced seismicity and longwall production at depths greater than 1,500 feet. No surface damage or slope failure was reported due to the seismicity.

Figure 4. Topography

Document Path: O:\T-Z\T\Missoula\114-570960 Skyline OMS Update\GIS\ArcMap\Fig3 Topography.mxd



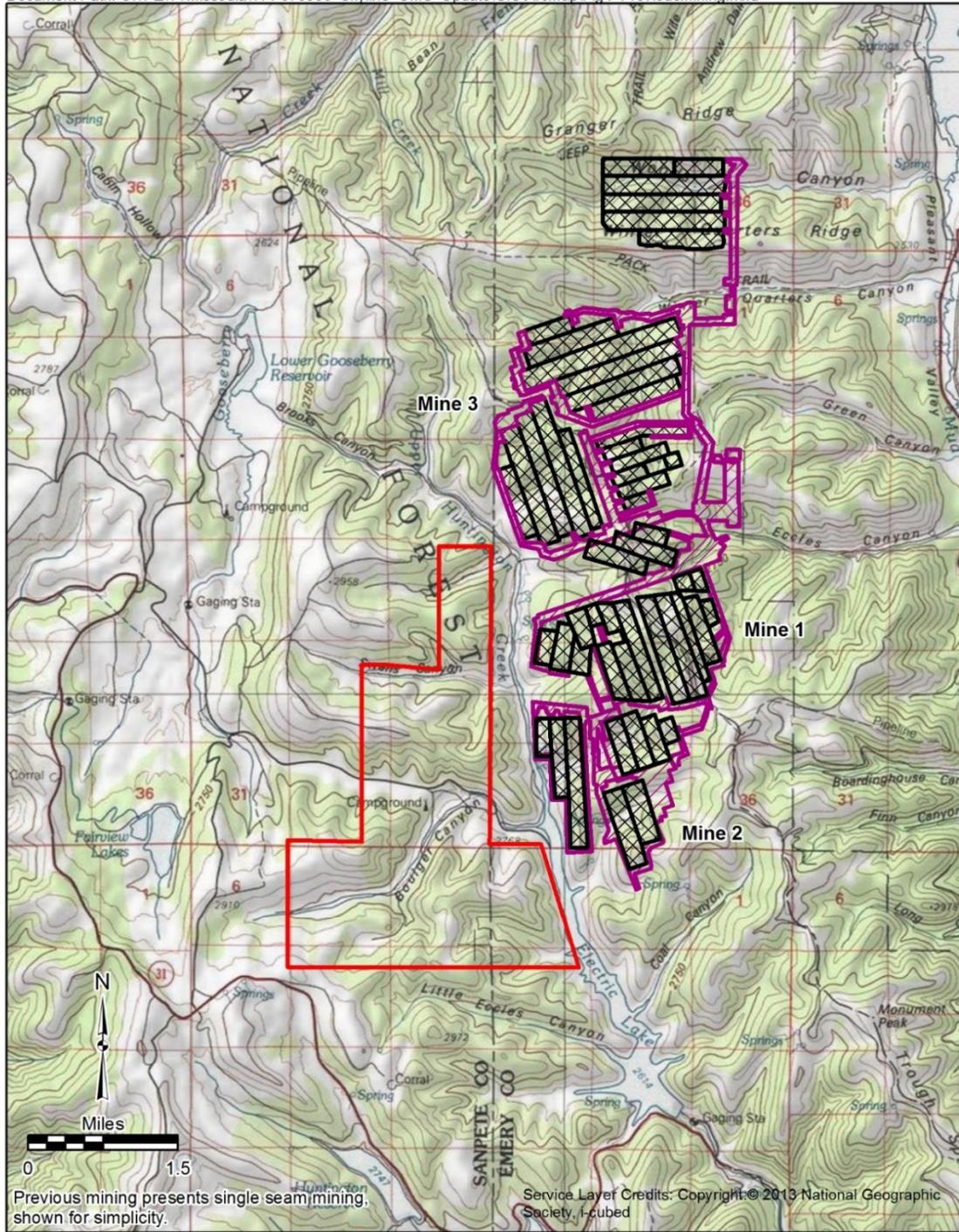
Service Layer Credits: Copyright © 2014 Esri
Sources: Esri, DeLorme, USGS, NPS

- Legend**
- Skyline Mine
 - Project Area
 - Lake
 - Stream/River
 - Past Subsidence
 - Estimated Subsidence
 - Previously Mined Area

Topography
Flat Canyon Mine
Plan Modification EA
Sanpete, Carbon, and Emery Counties, Utah

Figure 5. Previous Mining

Document Path: O:\T-Z\T\Missoula\114-570960 Skyline_OMS_Update\GIS\ArcMap\Fig4_PreviuousMining.mxd



Legend

-  Mined Long Panel
-  Mined Room and Pillar
-  Project Area

Previous Mining

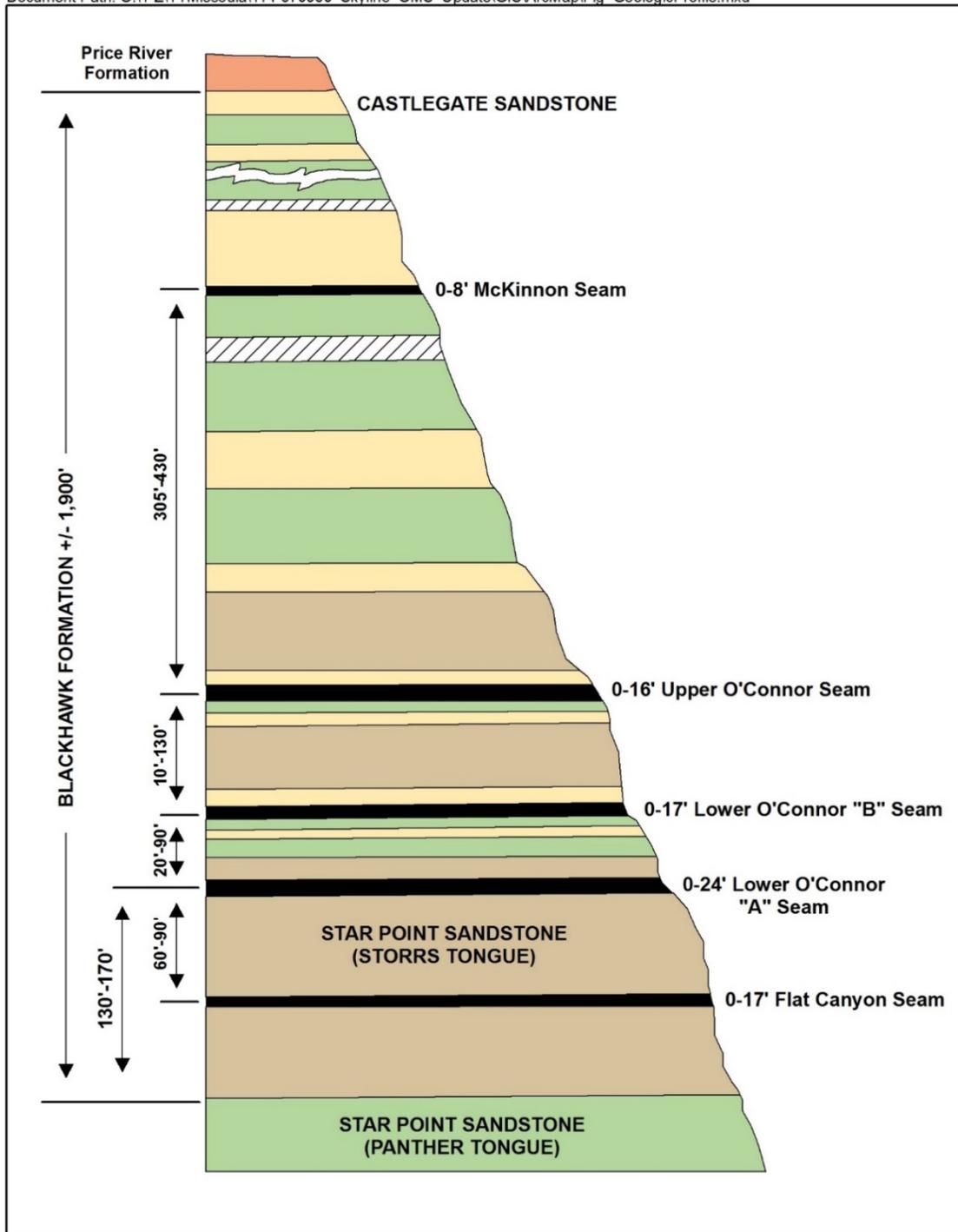
Flat Canyon Mine

Plan Modification EA

Sanpete, Carbon, and Emery Counties, Utah

Figure 6. Generalized Columnar Section

Document Path: O:\T-Z\T\Missoula\114-570960 Skyline_OMS_Update\GIS\ArcMap\Fig_GeologicProfile.mxd



Generalized Columnar Section
Flat Canyon Mine
Plan Modification EA
Sanpete, Carbon, and Emery Counties, Utah

3.3 Air Quality and Climate Change

3.3.1 Air Quality

3.3.1.1 Airshed for Analysis

The regional airshed for analysis was delineated using topography with consideration of the climatic wind regime based on the location of Skyline Mine's surface facilities (where the emissions occur). Skyline Mine facilities were assessed to determine the likely region where local emission impacts could occur to determine the likely region of influence. The regional airshed is approximately 1,891 square miles (**Figure 7**). The airshed's northern boundary runs along the north side of Highway 6 from the town of Tucker to Helper, Utah. The northeast part of the airshed is bounded by the Book Cliffs from Helper to just south of East Carbon. The southeast boundary of the airshed is made up of Flattop Mountain, Cedar Mountain, Sids Mountain and various ridges in between to approximately four miles north of County Road 803. The southwest boundary lies between the towns of Ferron and Moore and turns north at Young's Peak. The western boundary runs along the eastern boundary of the Manta-La Sal National Forest north to Red Point then heads northwest to Candland Mountain. The boundary continues north on along the east side of Electric Lake along ridgetops to the town of Tucker.

3.3.1.2 Regulatory Requirements

Federal actions must meet the requirements of the CAA and must not cause or contribute to a violation of applicable air quality standards. The State of Utah, Division of Air Quality (UDAQ) is the delegated authority for implementing the CAA in Utah and has developed a State Implementation Plan, outlining the requirements and regulations that the State will follow to assure that it is and will remain in compliance. There are no county or local air quality permitting requirements.

Criteria Pollutants National Ambient Air Quality Standards

The EPA sets the standards for the criteria pollutants (**Table 5**). The National Ambient Air Quality Standards (NAAQS) include primary and secondary standards for criteria pollutants. Primary standards provide for the protection of the public health, including "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide for the protection of the public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. The EPA designates whole or partial counties as attainment, non-attainment, or maintenance for each criteria air pollutant. Areas of the country where air pollution levels persistently exceed the NAAQS are designated as nonattainment. Areas that are able to meet the NAAQS are designated as attainment areas. These designations have been developed to help areas with air pollution above the NAAQS to conform, and to prevent the deterioration of air quality in areas that currently meet the NAAQS. The monitored ambient air quality levels in the regional airshed indicate that the criteria pollutant levels for all criteria pollutants are below the applicable NAAQS (**Table 5**), therefore, EPA has designated the area as an attainment area for all criteria pollutants. In attainment areas like Carbon County, the CAA allows for growth and limited degradation of the ambient air quality that may be associated with that growth.

Figure 7. Regional Airshed



- Legend**
- Town
 - Skyline Mine
 - Project Area
 - Regional Airshed Boundary
 - US Forest Service Lands
 - County

Regional Airshed
Flat Canyon Mine
Plan Modification EA
 Sanpete, Carbon, and Emery Counties, Utah

Table 5. NAAQS

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 period	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	1 year	53 ppb ⁽²⁾	Annual Mean
Ozone (O ₃)		primary and secondary	8 hours	0.070 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	PM _{2.5}	primary	1 year	12.0 µg/ m ³	annual mean, averaged over 3 years
		secondary	1 year	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
	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	1 year	15.0 µg/ m ³	Not to be exceeded more than once per year

Source: (EPA, 2016a)

(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/m³ as a calendar quarter average) also remain in effect.

(2) The level of the annual NO₂ 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.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards additionally remain in impact in some areas. Revocation of the previous (2008) O₃ standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

Prevention of Significant Deterioration

The CAA also divides areas where air quality is already cleaner than required by federal standards into three classes, and specifies the increments of SO₂, NO₂ and PM pollution allowed in each class (**Table 6**) as regulated by the Prevention of Significant Deterioration regulations (40 CFR 52.21).

Table 6. Federal Prevention of Significant Deterioration Limits

Pollutant	Averaging Time	Class I Area Maximum Allowable Increase ($\mu\text{g}/\text{m}^3$)	Class II Area Maximum Allowable Increase ($\mu\text{g}/\text{m}^3$)	Class III Area Maximum Allowable Increase ($\mu\text{g}/\text{m}^3$)
PM _{2.5}	Annual	1	4	8
	24-hour	2	9	18
PM ₁₀	Annual	4	17	34
	24-hour	8	30	60
SO ₂	Annual	2	20	40
	24-hour	5	91	182
	3-hour	25	512	700
NO ₂	Annual	2.5	25	50

$\mu\text{g}/\text{m}^3$ = Micrograms Per Cubic Meter of Air

The five mandatory Class I areas in Utah include: Zion National Park, Bryce National Park, Capitol Reef National Park, Arches National Park, and Canyonlands National Park (UAC, 2016). The closest Class I area is Capitol Reef, approximately 75 miles to the southwest of the project. This Class I area would not be affected by the proposed action. The allowable increments of new pollution in these areas are very small. All other areas are designated as Class II except non-attainment areas (UAC, 2016); where allowable increments of new pollution are modest. Class III represents selected areas that states may designate for development; allowable increments of new pollution are large (but not exceeding NAAQS). No Class III areas are designated in Utah (UAC, 2016). Because the Project Area is not in a national park or a non-attainment area, it is located in a Class II area².

The regulations are applicable to a source pollutant if the source has the potential to exceed the major source thresholds of either 100 or 250 tons per year of a regulated New Source Review pollutant, depending on the type of source pollutant. For stationary source categories listed in the regulation, the threshold is 100 tons per year, while the threshold for source categories that are not listed, such as surface mining operations, is 250 tons per year. The potential to emit calculation does not include fugitive emissions for the purpose of determining if the facility exceeds 250 tons per year. Fugitive emissions are defined by EPA as, “*those emissions that could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening*”.

The Skyline Mine is classified as a minor source of emissions that would not exceed the 250 tons per year threshold for non-listed sources. Therefore, Prevention of Significant Deterioration regulations and preconstruction monitoring are not applicable to the mine or the Proposed Action.

HAPs

The CAA also enacted the New Source Performance Standards and National Emissions Standards for Hazardous Air Pollutants (HAPs) for specific types of equipment located at new or modified stationary pollutant sources. New Source Performance Standards regulations limit emissions from source categories to minimize the deterioration of air quality. Stationary sources are required to

² R307-405 Permits: Major Sources in Attainment or Unclassified Areas.

meet these limits by installing newer equipment or adding pollution controls to older equipment that reduce emissions below the specified limit. The Proposed Action would not include equipment that is subject to these regulations. New Source Performance Standards and National Emissions Standards for HAPs standards will apply to final coal combustion.

Unlike criteria pollutants, there are no NAAQS for HAPs. Although, these pollutants are also regulated under the CAA, the approach taken is focused on restricting or limiting emissions of pollutants, setting emission standards and control requirements, and requiring record keeping and reporting of emissions to demonstrate on-going compliance with applicable limits and requirements.

HAPs are defined in 40 CFR part 61 as a pollutant that causes or may cause cancer or serious health impacts such as birth defects. There are currently 187 listed HAPs (EPA, 2016b) The majority of HAPs originate from stationary sources (e.g., factories, refineries, power plants) and mobile sources (e.g., cars, trucks, buses), as well as indoor sources (building materials and cleaning solvents). Specific permitting requirements are a function of the type of source or activity to be permitted, the type(s) of pollutants, and the quantity of pollutants to be emitted. Sources that have the potential to emit greater than 10 tons per year of any one HAP; or more than 25 tons per year of all HAPs in aggregate; are classified as major sources. Sources are considered minor if they are less than the limits set for major sources.

The Skyline Mine would not be categorized as a major source for HAPs because the mine produces a maximum of 0.23 tons per year of total HAPs (HDR Engineering, Inc., 2015). Skyline Mine is not required to obtain a Federal Title V operating permit.

Mercury

The final location of coal combustion is regulated under environmental regulations. On December 16, 2011, the EPA finalized the first national standards (40 CFR Part 63) to reduce mercury and other toxic air pollution from coal and oil-fired power plants. These rules set technology-based emissions limitation standards for mercury and other toxic air pollutants, reflecting levels achieved by the best-performing sources currently in operation. The final rule sets standards for all HAPs emitted by coal- and oil-fired electric generating units with a capacity of 25 megawatts or greater. All regulated units are considered major under the final rule. EPA did not identify any size, design, or engineering distinction between major and area sources. Existing sources generally have up to four years to comply with the Mercury and Air Toxics Standards (MATS).

The emissions limits associated with the MATS rule are presented in **Table 7**. The National Electric Energy Data System identified coal and oil fueled electricity generating plants where the MATS rule is likely to apply (EPA, 2011). In Utah, the power plants that the MATS rule is likely to apply to are all coal fired. The plants and the county they are in are Bonanza (Uintah), Carbon (Carbon), Hunter (Emery), Huntington (Emery), Intermountain Power Project (Millard), KUCC (Salt Lake), and Sunnyside Cogen Associates (Carbon).

Table 7. MATS Emission Requirements – Coal and Oil-Fired Units

Subcategory	Existing Mercury Emission Limit (lb./GWh)	New Mercury Emission Limit (lb./GWh)
Regular Coal	0.013	0.0002
Designed for Low Rank Coal ¹	0.12 or 0.040	0.04
IGCC (Gasified Coal)	0.03	0.003
Solid-oil Derived & Continental Liquid Oil	0.002	0.002
Continental Liquid Oil	NA	0.0001
Non-continental Liquid Oil	0.004	0.0004

Source: 40 CFR Part 63.

lb./GWh = pounds of pollutant per gigawatt – electric output

Greenhouse Gases

There are no NAAQS for GHGs. In its Endangerment and Cause or Contribute Findings for Greenhouse Gases under CAA Section 202(a) (FR EPA-HQ-OAR-2009-0171), EPA determined that GHGs are air pollutants subject to regulation under the CAA. EPA acted on its understanding that GHG pollutants have long-term impacts on the climate because of their increasing concentrations in the earth's atmosphere, which has been tied to industrialization and the burning of fossil fuels. The amount of GHG emissions produced by mining or burning coal varies depending on the mining technique used (i.e., surface versus underground mining) and combustion technologies employed.

EPA has regulated six key GHGs: CO₂, CH₄, N₂O, hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF₆). Because CO₂ is the most prevalent of the regulated GHGs, the EPA references the impact of GHG emissions in terms of their equivalence to CO₂ or CO₂e.

Under the EPA's GHG Mandatory Reporting Rule (74 FR 56260, 40 CFR 98), coal mines subject to the rule are required to report emissions in accordance with the requirements of Subpart FF, which is applicable to underground coal mines. The EPA Tailoring Rule (70 FR 31514, 40 CFR 51, 52, 70, and 71) was, in part, struck down by a 2014 Supreme Court decision. Based on the Supreme Court decision, an underground mine is subject to permitting for GHGs only if the mine has the potential to emit more than 100,000 tons per year of CO₂e and if the mine exceeded the major source threshold for one or more criteria pollutants.

The President's Clean Power Plan [40 CFR Part 60 Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule, 2015, (EPA, 2015a)] directs regulations for power plants and does not apply to OSMRE's Proposed Action to approve a mining plan modification.

3.3.1.3 Regional and Local Air Quality

The Project Area and regional airshed are currently in attainment or unclassified for all criteria pollutants. Population centers or areas of specific interest in the region are monitored for criteria pollutants and as a result the data collected for this analysis is regionally representative. The UDAQ maintains a network of monitoring stations across the state. One of these monitoring stations is

located in Price, Utah (Carbon County). There are no monitoring stations in the surrounding counties (Sanpete and Emery). In the late 1990s the EPA allowed monitoring to cease where pollutants were less than 60 percent of the NAAQS (UDAQ, 2015a). There are no local monitoring stations.

Industrial Sources

Permitted air quality emission sources located within 50 miles of the Skyline Mine are shown in **Table 8**. DEQ includes all sources of air quality emissions that are required by law to acquire a state air quality permit. Sources such as dust from dirt roads, agricultural operations, recreational activities, and automobile use are not included because they are not regulated as stationary industrial sources but have the capacity to produce air quality emissions regionally.

Table 8. Utah Large Industrial Source Emissions (Tons per Year) by Facility - 2012

Site Name (Miles from Skyline Mine)	City	County	CO	NO _x	PM ₁₀	SO _x	PM _{2.5}	VOC
Wellington Asphalt Plant (28)	Wellington	Carbon	3.59	8.8	0.8	3.5	0.3	4.8
Oak Spring Turbine Compressor Station (12)	Spring Glen	Carbon	2.6	55.2	11.1	0.2	11.1	0.9
Carbon Power Plant (18)	Helper		153.6	3,587.8	459.8	8,307.7	432.7	18.4
Price Dew Point Plant (21)	-	Carbon	4.0	1.5	0.1	0.0	0.1	21.2
East Carbon Landfill (40)	East Carbon	Carbon	9.0	18.8	11.4	1.9	3.2	42.5
Sunnyside Cogeneration Facility (45)	Carbon County	Carbon	68.3	400.6	61.2	586.3	38.9	11.7
Huntington Power Plant (22)	Huntington	Emery	4,012.2	7,389.8	665.9	2,301.2	244.1	83.1
South Town Quarry & Concrete Batch Plant (34)	Nephi	Juab	2.9	11.7	8.7	0.9	3.1	1.1
Salem Aggregate Facility (34)	Salem	Utah	1.3	4.5	13.8	0.7	1.4	0.4
Gomex Pit- Aggregate Processing Plant (33)	Spanish Fork	Utah	0.3	1.1	1.9	0.1	0.9	0.1

Source: <http://enviro.deq.utah.gov/>. (UDAQ, 2016)

Table 9 indicates the oil and gas compressor and gas plant emissions for 2012 in Utah.

Table 9. 2012 Oil and Gas Compressor and Gas Plant Emissions (Tons per Year)

Site Name (Miles from Skyline Mine)	NO _x	VOC	NO _x & VOC Combined
Scofield Compressor Station (6.7)	2.05	1.66	3.70
Oak Spring Turbine Compressor Station (12.1)	55.16	0.89	56.05
Drunkards Wash Compressor Station (19.6)	58.91	44.45	103.36
Emma Park Natural Gas Treatment Plant (24.4)	58.91	44.45	103.36
Aberdeen Field Compressor Station (24.5)	58.91	44.45	103.36
Cave Pad Compressor Station (25.2)	6.95	2.55	9.50

Source: (UDAQ, 2016).

Ambient Background Monitoring

The record keeping and reporting required by the Approval Order: DAQE-AN10092001-15 provides evidence that Skyline Mine is in compliance with all permit standards. The Skyline Mine is required

to maintain records of operational throughput to provide evidence of compliance with all throughput limitations. The maximum throughputs listed in the Approval Order were used to calculate the facility potential to emit emissions. The facility emissions will not be exceeded as long as the throughput limits are not exceeded.

The only monitoring station in the regional airshed is in Price, Utah, approximately 25 miles east-southeast of the Project Area.

PM₁₀

PM₁₀ data monitoring data from Price showed the highest 24-hr concentration was 48 micrograms per cubic meter of air; below the NAAQS of 150 micrograms per cubic meter (**Table 5**). The meteorological data is for January 1, 2006 through December 31, 2010 (HDR Engineering, Inc., 2015).

NO₂

The Price monitoring station registered one exceedance of the NO₂ 1-hour NAAQS in 2012 and none in 2013 or 2014 (UDAQ, 2015a). The highest hourly background at the site during 2014 was 6.1 parts per billion (ppb) which is below the NAAQS (100 ppb).

Ozone

The Price monitoring station registered one exceedance of the ozone 8-hour 2008 NAAQS in 2012, and none in 2013 or 2014 (UDAQ, 2015a). The highest 8-hr background at the site during 2014 was 0.067 parts per million which is below the NAAQS (0.070 parts per million, or 70 parts per billion).

SO₂ and CO

The monitoring station in Price does not measure SO₂ or CO. Three network stations outside the regional airshed monitor CO (in Hawthorne, Ogden, and North Provo). During the reporting period 2010 through 2015, none of the monitoring stations in the network registered exceedances of the NAAQS for CO. UDAQ reports that all areas in Utah are in compliance with the NAAQS for CO. (UDAQ, 2015a). Stations that monitor SO₂ are in Beach, Magna, North Salt Lake, Hawthorne, Bountiful, and Roosevelt. Of these, only the Beach station registered an exceedance of the primary 1-hour SO₂ NAAQS during the 2011 through 2014 reporting period. The exceedance occurred one time in 2013. All sites show a decreasing trend (UDAQ, 2015a).

EPA Air Quality Index

The air quality index (AQI) is a range used by the EPA to measure and characterize the quality of air at a given location (EPA, 2014). The AQI focuses on health impacts that may be experienced within a few hours or days after breathing polluted air. AQI index ranges from 0 to 500.

- 0 to 50 – good,
- 51 to 100 – moderate,
- 101 to 150 - unhealthy for sensitive groups,
- 151 to 200 – unhealthy,
- 201 to 300 - very unhealthy,
- 301 to 500 – hazardous

The 2014 Carbon County AQI consisted of 350 days when air quality was good, and 15 days that experienced moderate conditions. From 2012 through 2014 Carbon County AQI consisted of 950

days registered as good, 144 days registered as moderate, and 1 day registered as unhealthy for sensitive groups.

3.3.2 Climate Change

3.3.2.1 Analysis Area for Climate Change

For climate, climate change, and GHG the analysis area is the state of Utah and the cumulative impacts analysis area is the US.

3.3.2.2 Greenhouse Gas Emissions and Climate Change

The primary natural and synthetic GHGs in the atmosphere are water vapor, CO₂, CH₄, nitrous oxide (N₂O), and fluorinated gases. GHGs allow heat from the sun to pass through the upper atmosphere and warm the earth by blocking some of the heat that is radiated from the earth back into space.

Human-caused CO₂ emissions occur from the combustion of fossil fuels (i.e., oil, natural gas, and coal) by industry and in the transportation sector, and as a result of other chemical reactions (e.g., the manufacture of cement). CH₄ emissions occur from livestock and other agricultural practices and also from the decay of organic waste placed in municipal solid waste landfills. CH₄ also is emitted during the production and transport of coal, natural gas, and oil. N₂O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Fluorinated gases, while not abundant in the atmosphere, are powerful GHGs that are emitted from a variety of industrial processes and are often used as substitutes for O₃-depleting substances (e.g., chlorofluorocarbons, hydrochlorofluorocarbons, and halons).

Utah

On a regional scale, the EPA estimated the 2013 CO₂ emissions in Utah were 66 million metric tons (73 million tons), although coal mined from Skyline may or may not be used in Utah (Energy Information Administration, 2015a). The U.S. emissions from fossil fuels in 2015 was 5,264 million metric tons, of which 1,499 million metric tons were from coal (Energy Information Administration, 2015b).

Utah is part of the National Climate Assessment's U.S. Southwest Region. The National Climate Assessment is a key deliverable of President Obama's Climate Action plan to cut carbon pollution. The May 6, 2015 Fact Sheet provides a comprehensive scientific assessment of climate change and its impacts across the Southwest Region of the U.S. The selected findings in Utah contribute to agricultural decline, loss in snowpack and streamflow, increased exposure to extreme heat, and stress on the diversity of ecosystems.

US

The EPA estimates the trend in GHG emissions in the U.S. by source sector (e.g., industrial, land use, electricity generation, etc.); fuel source (e.g., coal, natural gas, geothermal, petroleum, etc.); and economic sector (e.g., residential, transportation, commercial, agriculture, etc.). **Table 10** shows the estimated GHG emissions by economic sector calculated based on output in units of

CO₂e (EPA, 2016d). Compared to 1995, the 2014 U.S. GHG emissions increased by 35 percent (based on total net emissions in 1995 divided by the total net emissions in 2014). CO₂e estimates are based on guidelines recommended by the Intergovernmental Panel on Climate Change from fossil fuel combustion, non-energy use of fuels, and stationary combustion, wastewater treatment, composting, landfills, cultivation, fermentation, etc. Reporting of emissions over 25,000 metric tons per year did not begin until 2009. The reporting is not used in the calculations of the estimated emissions in the EPA's report, but is used to "improve the national estimates presented" in the inventory (EPA, 2016d).

Table 10. 1995-2014 Estimated US Greenhouse Gas Emissions Allocated to Economic Sectors (Million Metric Tons of CO₂e)

Implied Sectors	1995	2005	2010	2014
Electric Power Industry	1,864.80	2,443.90	2,300.50	2,080.70
Transportation	1,551.30	1,999.60	1,827.40	1,810.30
Industry	1,620.90	1,486.20	1,394.50	1,461.70
Agriculture	563.40	600.20	631.10	625.40
Commercial	418.10	420.30	425.50	453.90
Residential	344.90	370.40	361.20	393.70
US Territories	33.70	58.20	45.30	44.70
Total Emissions	6,397.10	7,378.80	6,985.50	6,870.40
Land Use, Land-Use Change, and Forestry (Sink)	(738.00)	(698.50)	(766.40)	762.50
Net Emissions (Sources and Sinks)	5,659.10	6,680.30	6,219.10	7,632.90

Source: Table 2-10 (EPA, 2016d)

Note that "Land Use, Land-Use Change, and Forestry" represents a sink rather than a source, and is therefore presented in parentheses.

Additionally, some of these gases may react with other chemical compounds in the atmosphere to form compounds that are GHGs.

National SO₂ emissions across the US are listed in **Table 11**. SO₂ emission levels have decreased since 1995, primarily due to increased emission controls for SO₂, including the increased use of low sulfur coal from mines in the western states.

Table 11. U.S. SO₂ (Indirect GHG) Emissions

Gas/Source	GHG 1995 (MMT)	GHG 2000 (MMT)	GHG 2007 (MMT)
SO ₂	16.89	14.83	11.73
Energy (combustion, etc.)	15.77	13.80	10.89
Industrial Processes	1.12	1.03	0.84
Chemical manufacturing	0.26	0.31	0.23
Metals processing	0.48	0.28	0.19
Other	0.37	0.37	0.29

3.3.2.3 Regional Climate

The proximity of the Wasatch Mountains exerts a strong influence on the climate and weather of the area. Areas east of the Wasatch Range are characterized by hot, dry summers and cold, dry

winters. Air movement at this latitude is predominately from the west and northwest year-round. The lower elevations receive less than 10 inches of precipitation annually. Higher elevations receive more than 14 inches of precipitation annually. Snow amounts are low east of the Wasatch Mountains. Average maximum temperatures in the area range from 97°F in July to 33°F in January. Average minimum temperatures range from 7°F in January to 58°F in July (BLM, 2008).

3.3.2.4 Local Climate and Meteorology

The Project Area and Skyline Mine are in an alpine subarctic climate with long cold winters and abundant snowfall, in excess of 200 inches per year (U.S. Climate Data, 2016). Additional climatic data can be found in the Probable Hydrologic Consequences report (Petersen Hydrologic, LLC, 2014a). Precipitation measured at the Skyline Mine surface facilities between 1985 and 2014 ranged from 17.2 inches to 29.4 inches per year (Canyon Fuel Company, 2014). Monthly average temperatures at the Skyline Mine range from 8.0° to 74.4 ° Fahrenheit.

The Palmer Hydrologic Drought Index for the Utah Region 4 (south central) and Utah Region 5 (northern mountains), where the Project Area is situated were characterized from 2006 through 2010 by generally near-normal climatic conditions with brief alternating periods of wetness and dryness. During 2011 the region experienced a period of severe wetness. During 2012, 2013, and early 2014 the region has experienced a period of continuous dryness (Petersen Hydrologic, LLC, 2014a).

Black Carbon

Black carbon is a by-product of incomplete combustion of fossil fuels, biofuels, and biomass. Black carbon is a likely by-product that would be emitted from haul trucks used during coal mining operations and locomotives used to haul coal from the mine. Black carbon is an unregulated pollutant; however, the EPA does regulate diesel fuel quality, such that in recent years diesel fuel quality has been improved.

Ninety-three percent of all mobile source emissions came from diesel engines in 2005 (EPA, 2016e). Black carbon directly absorbs light and reduces the reflection of heat off snow and ice as it gets deposited. Black carbon has been linked to climate impacts due to increased temperatures and accelerated ice and snow melt.

Black carbon is a component of the anthropogenic climate phenomenon; however, it is very short-lived in the atmosphere, lasting only a few days to a few weeks. Although short lived, while in the atmosphere black carbon is the most strongly light-absorbing component of particulate matter. Black carbon can absorb a million times more energy than carbon dioxide. Black carbon is a major component of “soot”, a complex light-absorbing mixture that also contains some organic carbon.

3.4 Social and Economic

The Skyline Mine surface facilities are located in Carbon County. Historically, most of the mining has been located in Emery County and Carbon County. In 2013, the population of Carbon County was about 21,000 (US Department of Commerce, 2014a). The Flat Canyon Coal Lease Tract UTU-77114 is in Sanpete County, with private surface and coal ownership extending into Emery County.

As the mining operations function through the mine facility in Carbon County, the tax revenue is recognized in Carbon County.

Table 12 shows the employment trend by industry and the overall contribution that each industry makes to the total labor earnings in Carbon and Sanpete counties. The average labor earnings per job in each industry was calculated by dividing the total labor earnings by the number of jobs.

Table 12. Employment by Industry – Carbon and Sanpete Counties

Industry	Total Number of Jobs ^{a,c}		Total Labor Earnings per Industry (\$1000) ^{b,d}		Average Labor Earnings per Job	
	Carbon ¹	Sanpete ²	Carbon ¹	Sanpete ²	Carbon	Sanpete
Farm	301	1,025	\$329	\$55,135	\$1,093	\$53,790
Forestry, fishing, and agriculture services	NA	196	NA	\$12,211	NA	\$62,301
Mining (including fossil fuels)	935	93	\$88,699	\$5,648	\$94,865	\$60,731
Construction	562	644	\$29,744	\$23,548	\$52,925	\$36,565
Manufacturing	393	893	\$22,829	\$34,828	\$58,089	\$39,001
Utilities	123	17	\$16,028	\$1,397	\$130,309	\$82,176
Wholesale trade	490	152	\$35,245	\$3,865	\$71,929	\$25,427
Retail trade	1,440	1,215	\$44,451	\$23,548	\$30,869	\$19,381
Transportation and warehousing	521	276	\$30,464	\$12,077	\$58,472	\$43,757
Information	85	228	\$2,423	\$11,642	\$28,506	\$51,061
Finance and insurance	371	431	\$9,761	\$7,388	\$26,310	\$17,142
Real estate and rental and leasing	352	498	\$3,480	\$6,020	\$9,886	\$12,089
Professional and technical services	565	494	\$21,677	\$14,249	\$38,366	\$28,844
Management of companies and enterprises	72	NA	\$5,037	NA	\$69,958	NA
Administrative and waste services	525	252	\$16,236	\$4,602	\$30,926	\$18,262
Educational services	NA	378	NA	\$10,983	NA	\$29,056
Health care and social assistance	NA	848	NA	\$27,694	NA	\$32,658
Arts, entertainment, and recreation	152	177	\$1,381	\$1,026	\$9,086	\$5,797
Accommodation and food services	716	565	\$11,795	\$7,060	\$16,473	\$12,496
Other services, except public administration	820	717	\$31,716	\$27,416	\$38,678	\$38,237
Government	2,090	2,668	\$104,966	\$121,161	\$50,223	\$45,413
Total/Average	11,765	11,819	\$507,605	\$403,068	\$43,145	\$34,103

1 2013 data; 2 2014 data

Sources:

a (US Department of Commerce 2014b)

b (US Department of Commerce, 2014b)

c (US Department of Commerce, 2015a)

d (US Department of Commerce, 2015b)

The mining sector is an important contributor to the employment and income in Carbon, Emery, and Sanpete counties. The Skyline Mine directly employs approximately 320 people (Galecki, 2015b). The Skyline Mine employment contributes approximately \$39 million annually in wages and benefits for these employees. The estimated royalty revenue from Skyline Mine to the federal government is \$134 million, with about 50% or \$67 million to the State of Utah, and 50% from the State of Utah or \$33 million to the counties of Sanpete and Emery (Jarrett, 2015). Of the 320 employees, the employee distribution is approximately 30 percent from Carbon and Emery counties, 60 percent from Sanpete County, and 10 percent from Utah County (Galecki, 2015b).

On July 1, 2015, Canyon Fuel Company was the successful bidder for the Flat Canyon Federal Coal Lease Tract UTU-77114 at \$17.2 million (\$0.4095 per ton) (BLM, 2015b). Revenues generated by this continued production of coal also benefits the State of Utah via the mineral lease funds, a portion of which funds the Permanent Community Impact Board. The Permanent Community Impact Board has been a major source for infrastructure projects in rural affected counties. Recent lower oil prices have decreased this fund.

In 2015 in the U.S., the industrial sector is the leading form of energy consumption (32 percent of total) followed by transportation (28 percent), residential (21 percent), and commercial (18 percent) (Energy Information Administration, 2016c).

Electricity generated for use in the US in 2015 came from sources listed in **Table 13**.

Table 13. 2015 Electricity Generation Fuel Sources

Fuel Source	Percent of Total
Coal	33%
Natural gas	33%
Nuclear	20%
Hydropower	6%
Other renewables	7%
Biomass	1.6%
Geothermal	0.4%
Solar	0.6%
Wind	4.7%
Petroleum	1%
Other gases	<1%

Source: (Energy Information Administration, 2016d).

3.5 Greater Sage-Grouse

The SIR identified three candidate species that were added to the US Fish and Wildlife Service (USFWS) county list since the 2002 FEIS. The SIR also confirmed that no suitable habitat for the additional species is found in the Project Area. For Forest Service sensitive species, the SIR identified the western boreal toad as the only species with suitable habitat within the lease area. The SIR concluded that the FEIS amphibian analysis was complete and no additional analysis was necessary. The greater sage-grouse (*Centrocercus urophasianus*) is the only rare species carried forward for analysis.

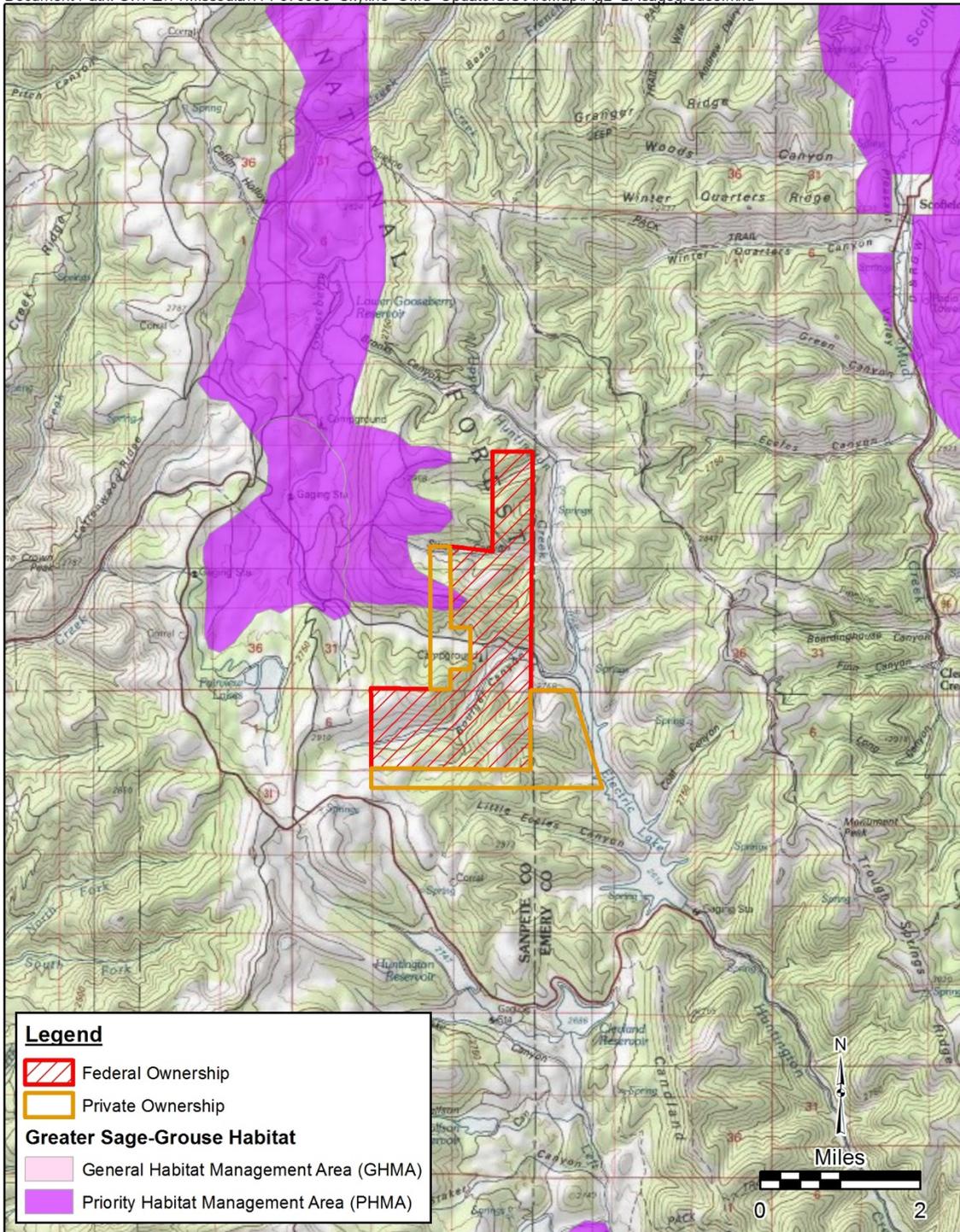
The Forest Service and the BLM, as cooperating agencies, engaged in a collaborative, landscape-level conservation effort for greater sage-grouse to conserve the species' habitat and avoid the continued decline of populations. The process was in response to the 2010 USFWS finding that greater sage-grouse was warranted but precluded for listing as a threatened or endangered species under the Endangered Species Act (USFWS, 2010). The conservation effort culminated in the incorporation of greater sage-grouse conservation measures into agency land use plans. In September 2015, the Forest Service issued a Greater Sage-Grouse ROD for Idaho/Southwest Montana, Nevada, and Utah and Land Management Plan Amendments for these states (US Forest Service, 2015). In September 2015, the BLM issued a ROD and Approved Resource Management Plan Amendments for the Great Basin Region (including the Utah subregion) (BLM, 2015c). The Land Management Plan Amendments provide direction and guidance for management activities in sage-grouse habitat management areas on National Forest and the Approved Resource Management Plan Amendments provide direction and guidance for activities on lands administered by the BLM, including split-estate lands with BLM subsurface mineral rights.

The BLM and Forest Service have identified Priority Habitat Management Areas and General Habitat Management Areas for greater sage-grouse. The Project Area is within the greater sage-grouse Carbon Biologically Significant Unit (BSU) (**Figure 8**). In addition, BLM and Forest Service have mapped sagebrush focal areas, which are stronghold areas that contain the highest breeding densities of greater sage-grouse and highest quality sagebrush habitat. Both the Land Management Plan Amendments and Approved Resource Management Plan Amendments identify management decisions that apply to these habitat management areas on National Forest or BLM-administered land, such as limiting or eliminating new disturbance in Priority Habitat Management Areas and sagebrush focal areas, and minimizing surface disturbance in General Habitat Management Areas.

The Project Area is partially located in a Priority Habitat Management Areas but is not within a sagebrush focal area. Approximately 78.3 acres of the Priority Habitat Management Areas falls within the Project Area (22.8 acres of which are located on National Forest, and 55.5 acres are on private land). The closest lek is approximately 9.8 miles to the northeast around Scofield Reservoir. There is no nesting/brood rearing habitat or winter habitat in the Project Area (UDWR, 2014).

Figure 8. Sage Grouse Priority Habitat Management Areas

Document Path: O:\T-Z\TMissoula\114-570960 Skyline OMS Update\GIS\ArcMap\Fig2_BAsagegrouse.mxd



Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

**Greater Sage-Grouse Habitat
Flat Canyon Mine
Plan Modification EA
Sanpete, Carbon, and Emery Counties, Utah**

3.6 Water Resources

3.6.1 Surface Water

The Project Area lies within the Right Fork Huntington Creek Sub-watershed (Hydrologic Unit Code 140600090102) within the Huntington Creek Watershed (HUC 1406000901) (**Figure 9**). The Huntington Creek watershed is a tributary of the larger San Rafael River drainage which in turn drains to the Green River approximately 80 miles below the Project Area. Less than six percent of the southwestern project boundary lies in the Gooseberry Creek Sub-watershed (140600070201), which is part of the Price River drainage (**Figure 9**). The Price River flows to the Green River approximately 60 miles below the Project Area. Upper drainages in the Price River watershed drain first into Mud Creek, which empties to the Scofield Reservoir. Eccles Creek is the largest.

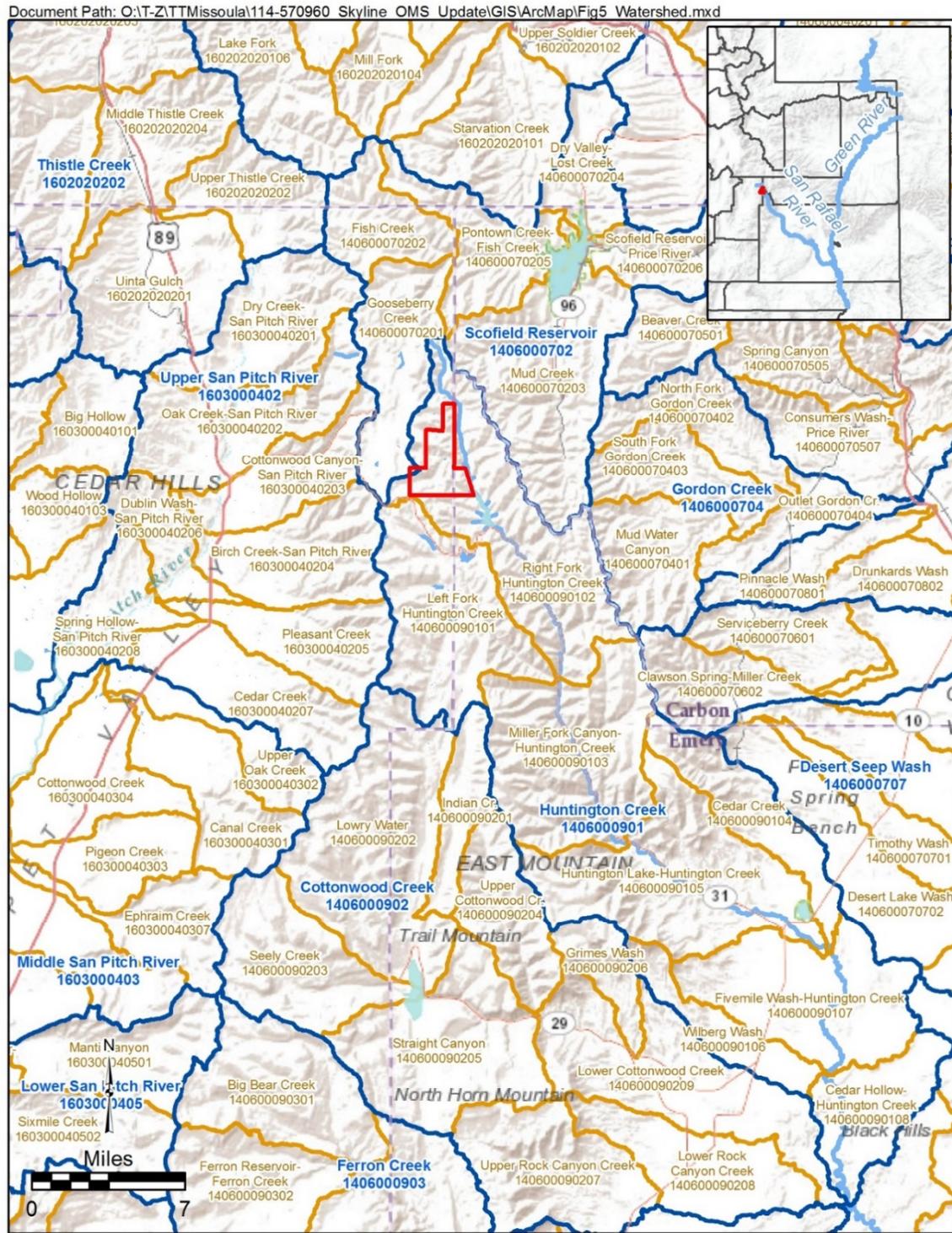
Perennial streams in the Project Area have been identified in Boulger, Flat, Swens, and Little Swens canyons; and in the upper portions of Huntington Canyon (**Figure 9**). The geomorphology of these sub-basins was described in detail in the 2002 FEIS (US Forest Service, 2002a). Stream flows are typical of intermountain regions, with relatively large flow volumes from snowmelt occurring in the spring and early summer months. As the spring runoff decreases in the later summer months, discharges drastically decrease to baseflows supported by active zone groundwater systems (Petersen Hydrologic, LLC, 2014a).

Electric Lake lies within Huntington Creek. The upper reaches above the dam of Electric Lake lie within the current Skyline Mine lease areas, but not within the footprint of the Project Area.

Many streams in the Project Area are gaining which suggests that perching layers identified beneath the systems effectively prevent streamflow losses to deeper groundwater systems in the subsurface (US Forest Service, 2002a). A study conducted by Canyon Fuel Company in Burnout Canyon, a tributary to Huntington Creek, concluded that there is little hydraulic connection between the perched perennial stream and their associated active shallow groundwater systems and the deeper groundwater systems, which may be intersected by mining. The study stated that “*no perceptible or quantifiable diminutions in peak flow or baseflow discharge rates are apparent*” (and the shallow groundwater system that sustains them) due to multiple-seam longwall mining occurring beneath the watershed (Petersen Hydrologic, LLC, 2014a). Monitoring was done in eight stream locations. The study indicates that the Skyline Mine workings (and deeper groundwater system) below Burnout Canyon, would not affect discharge rates because streams are hydraulically isolated from the perched stream channel – shallow groundwater system.

Spring and seep surveys were conducted in the Project Area during low-flow conditions in the fall of 1997 and during high-flow conditions in the spring of 1998. Monitoring of springs and seeps during both low- and high-flow conditions were continued until 2000. Monitoring for flow and water quality for baseline conditions was resumed in 2006 and has continued to present, including 18 spring monitoring sites on 14 springs. The monitoring indicates that the potential for contamination, diminution, or interruption of groundwater systems is remote because the underground mining would intersect the inactive-zone groundwater in perched systems. These perched systems do not have any known uses or State appropriations (Peterson Hydrologic, LLC 2014a).

Figure 9. Watershed Boundaries



Legend

- Project Boundary
- HUC-12 Boundary
- HUC-10 Boundary

Watershed Boundaries
Flat Canyon Mine
Plan Modification EA
Sanpete, Carbon, and Emery Counties, Utah

3.6.2 Groundwater

The geologic formations in the Project Area generally consist of interbedded shale, mudstone and siltstone that are laterally discontinuous. This discontinuity results in a lack of heterogeneity that affects water storage and transmission. In effect, groundwater flow is discontinuous and not generally transmitted great distances, either vertically or horizontally (Petersen Hydrologic, LLC, 2014a).

The shallow groundwater – surface water systems primarily consist of colluvial/shallow bedrock or alluvial deposits with enhanced weathering and fracturing. These systems occur in the thick soil mantle and slope wash colluvial deposits or higher permeable alluvial deposits. The relatively low-permeability horizons in bedrock formations hinders appreciable migration of groundwater to deeper stratigraphic horizons and creates perched surface water conditions (Petersen Hydrologic, LLC, 2014a).

An additional formation called the Star Point Sandstone Formation does not outcrop in the Project Area, but lies both above (in some areas) and beneath the mining zones of the Skyline Mine. The Star Point Sandstone Formation is a massive, moderately fine- to medium-grained sandstone that is moderately well consolidated. Individual sandstone units are separated in portions of the area by partings of low-permeability siltstones or mudstones. Studies have indicated that groundwater flowrates in the Star Point Sandstone Formation are low with hydraulic conductivities measured in minimally-fractured zones immediately south of the Project Area of 4.8×10^{-8} to 7.4×10^{-8} feet per second (Petersen Hydrologic, LLC, 2014b). However, in the Skyline Mine, inflows of groundwater have occurred that are associated with fault and/or fracture systems (secondary permeability) encountered in the Star Point Sandstone Formation.

There are no known uses of the Star Point Sandstone water in the vicinity of the Project Area (Peterson Hydrologic, LLC 2014a). This is likely because of the extremely low primary hydraulic conductivity and the lateral discontinuous nature of the deep groundwater systems.

3.6.3 Surface and Groundwater Quality

Water quality results from the spring and seep monitoring program within the Project Area (Petersen Hydrologic, LLC, 2014a) show the shallow groundwater are low in total dissolved solids (TDS) (i.e. salts) and is of the calcium-bicarbonate geochemical type. This geochemical type is consistent with the dissolution of carbonate minerals and buffers against oxidation of sulfide minerals eliminating the potential for acid mine drainage or metal leaching.

The water quality of surface water drainages in the Project Area is similar to that observed in the springs and seeps that discharge from the perched shallow groundwater systems. The water quality is also of the calcium-bicarbonate geochemical type with low TDS concentrations (Petersen Hydrologic, LLC, 2014a). The Probable Hydrologic Consequences report (Petersen Hydrologic, LLC, 2014a) also concluded that the stream water quality compositions are generally the same because the streamflow is supported by the active shallow groundwater perched system.

Groundwater quality, including that of the Star Point Sandstone, meets State of Utah drinking water standards for the parameters that have been analyzed. Untreated spring water is used at cabins and campgrounds.

3.6.4 Mine Dewatering and Discharges

Eccles Creek drains to Mud Creek and then to the Scofield Reservoir. The Scofield Reservoir is approximately 2,800 acres with a capacity of approximately 74,000 acre-feet (US Forest Service, 2002a). Water produced in the underground workings of the Skyline Mine has historically been discharged into Eccles Creek just below the Manti-La Sal National Forest boundary. The discharge is permitted by a UPDES permit (UT0023540) (DWQ, 2015). The outfall which discharges to Eccles Creek is both the continuous pumped groundwater and stormwater runoff from the mine. Because the mine water is comingled with stormwater, the discharge is run through a small sedimentation pond as a best management practice. The water quality in Eccles Creek is monitored above the discharge outfall and at the point source of discharge as specified in the UPDES permit, included in the mine permit. Effluent limitations were established for total effluent flow, iron, total suspended solids, total dissolved solids, dissolved oxygen, pH, oil and grease, and whole effluent toxicity.

Before 1999, very little water was intercepted by underground mining. Small quantities of water were sometimes intercepted in some of the Skyline Mine workings, while adjacent workings were dry. The combined water discharge from the Skyline Mine was generally less than 1,000 gallons per minute and was typically a few hundred gallons per minute (Petersen Hydrologic, LLC, 2014a). Mining operations progressed to the southwestern portion of the Skyline Mine beginning in 1999, where appreciably more groundwater was intercepted. The primary source of the groundwater was upwelling from intercepted faults and fractures in the Star Point Sandstone Formation, which underlay the Skyline Mine workings. In 2001, Canyon Fuel Company mined through a more significant fault which resulted in higher flows into the Skyline Mine workings and increased discharges to the Eccles Creek outfall. Groundwater inflows peaked in 2003 with discharges exceeding 8,000 gallons per minute (Petersen Hydrologic, LLC, 2014b). As a result of these increased flows, a groundwater pumping well (JC-1) was drilled and completed in a fracture system of the Star Point Sandstone Formation to depressurize this section of the formation. Water is pumped from this well and discharges to Electric Lake. Pumping rates have varied between 2,000 and 4,000 gallons per minute and continue to this day. Mining in this area was completed in 2003 and water levels in the Skyline Mine pool were allowed to rise and flood that portion of the Skyline Mine. By September 2004, the water levels in the southwest Skyline Mine pool had risen to the 8,350 foot level where it is maintained for current mining activities by pumping discharges to the Eccles Creek outfall. The pumping from the southwest pool decreased with additional head on the inflows with the discharge rates decreasing to a present day rate of approximately 1,880-2,000 gallons per minute.

Groundwater discharge supports base flow to creeks that are classified as “High Quality Waters – Category 1” by the State of Utah, Utah Administrative Code (UAC) R317-2 (Petersen Hydrologic, LLC, 2014a).

3.7 Soils

County soil survey data are not available for the Project Area (NRCS, 2016). However, based on similar elevation, topography, and vegetation, soils within the Project Area and Skyline Mine area can be expected to be similar to those found in a mapped area located immediately east of Huntington Creek. Four soil map units occupy the majority of this area;

- Curecanti family – Pathead complex (Map Unit 23),
- Senchert family – Senchert complex (Map Unit 105),
- Trag – Croydon complex (Map Unit 118), and
- Uinta – Toze families complex (Map Unit 125).

The Curecanti family – Pathead complex is found on convex and linear mountain slopes and canyons with slopes ranging from 40 to 70 percent located at elevations between 6,980 to 8,970 feet above sea level. These soils consist of loams and sandy loams derived from sandstone and shale colluvium. In areas where Curecanti family soils are present soil depths exceed 60 inches. Pathead soils are shallower, extending between 20 and 40 inches in depth before encountering lithic bedrock.

The Senchert family – Senchert complex is found on convex mountain slopes with slopes ranging from 30 to 50 percent located at elevations between 7,980 to 9,070 feet above sea level. These soils consist of loams, clay loams, and sandy loams derived from sandstone and shale alluvium and colluvium. These soils are between 20 and 40 inches deep and overlie lithic bedrock.

The Trag – Croydon complex is found on convex mountain slopes with slopes ranging from 30 to 60 percent located at elevations between 7,580 to 9,470 feet above sea level. These soils consist of loams and clay loams derived from sandstone and shale alluvium and colluvium. In areas where Trag soils are present soil depths exceed 60 inches. Where Croydon soils are present, soil depths extend between 40 and 60 inches before encountering bedrock. This map unit is not prime farmland.

The Uinta – Toze families complex is found on convex mountain slopes with slopes ranging from 35 to 70 percent located at elevations between 7,780 to 9,570 feet above sea level. These soils consist of clay loams, sandy loams, and silty loams derived from sandstone, shale, and siltstone colluvium. In areas where Uinta soils are present range from 40 to 60 inches before encountering bedrock. Toze soils are deeper and extend below 60 inches in depth.

Chapter 4

Direct and Indirect Impacts

4.1 Introduction

This chapter describes the direct and indirect impacts in sufficient detail to understand a change from the present as a result of the alternatives considered in detail (OSMRE, 1989). Direct impacts are those that are caused directly by the proposed activities at the same time and place (40 CFR 1508.8(a)). Indirect impacts are those that are removed in time and place (40 CFR 1508.8(b)). Impacts may be short-term (also referred to as temporary) or long-term. Short-term impacts generally occur for a short period during a specific time. Long-term impacts would generally last the life of the project and beyond. Impacts are also described by level of significance

- Major Impact: Impacts that potentially could cause irretrievable loss of a resource; significant depletion, change, or stress to resources; or stress within the social, cultural, and economic realm.
- Moderate Impact: Impacts that potentially could cause some change or stress to an environmental resource but the impact levels are not considered significant.
- Minor Impact: Impacts that potentially could be detectable but slight.
- Negligible Impact: Impacts in the lower limit of detection of an impact that could cause an insignificant change or stress to an environmental resource or use.
- No Impact: No discernible or measurable impacts.

Impacts are adverse unless specifically stated that they are beneficial.

The determination if impacts varies for each resource and the context of the specific Proposed Action. When available, the analysis applies quantitative thresholds to determine the level of significance. Other issues have been analyzed qualitatively.

Direct and indirect impacts from the Proposed Action would result from mining the coal, subsidence, water use and discharge, extending the life of the Skyline Mine by 9 to 12 years, coal transportation, and coal combustion. Direct and indirect impacts are analyzed in this EA for topography and geology from subsidence (to support the understanding of the impacts on water and soils), water (to update monitoring data), air quality and climate change (criteria pollutants and GHG), social and economic (environmental justice populations and updated employment and tax revenue), greater sage-grouse, and soils. The analysis of other resources is adequately addressed in the previously completed Flat Canyon Coal Lease Tract FEIS (US Forest Service, 2002a), its ROD (US Forest Service, 2002b), and the associated SIR (US Forest Service, 2013). The analysis in this EA tiers to the 2002 FEIS (40 CFR 1502.20) The 2002 FEIS, the Forest Service and BLM RODs, SIR, and BLM's Determination of NEPA Adequacy (see Section 1.2) are incorporated by reference (40 CFR 1502.21).

4.1.1 Summary of Direct and Indirect Environmental Impacts

Table 14 summarizes and compares the potential direct and indirect environmental impacts associated with the Proposed Action and the No Actions.

Table 14. Comparison of Direct and Indirect Impacts

Resource	Proposed Action	No Action
Topography and Geology	Subsidence resulting in negligible impacts on topographical changes or horizontal tension fractures.	No direct or indirect long or short term impacts on topography.
Air Quality and Climate Change		
Direct – Emissions of Criteria Pollutants	Impacts on emissions of criteria pollutants would be negligible and long-term. Although it is possible to calculate the direct emissions of criteria pollutants from mining and processing coal under the Proposed Action, they would not be discernable or measure at any of the regional monitoring locations.	There would be no direct impacts.
Direct HAPs	There would be negligible long-term impact from the emission of HAPs.	Same as Proposed Action but would end in 2018.
Direct GHG ² emissions	The direct emission of GHG would be negligible based on the measured emissions. GHG effects on the climate are long-term.	Impacts would be the same as Proposed Action (negligible), but would end in 2018.
Indirect – Emissions of Criteria Pollutants	Indirect effects would be the same as direct effects.	Impacts would be the same as the Proposed Action (negligible) but would end in 2018.
Indirect HAPs	There would be negligible, long-term impact from the emission of mercury 14 pounds per year, or 166 pounds of mercury for the probable maximum total 47 million tons of coal.	The mercury emission of mercury 14 pounds per year would be short-term, ending in 2018.
Indirect – Coal Transport and Combustion GHG emissions	CO ₂ e from rail transport would be negligible and long-term, 36,476 tons per year for 9 to 12 years.	Same as Proposed Action except impacts would be short-term ending in 2018
Social and Economic	Continued mine operation would extend 320 jobs at the mine and an undetermined number of support service jobs for 9 to 12 years. Impacts would be considered minor, beneficial, and long-term.	320 jobs at the mine and an undetermined number of associated jobs in the community would be end with mine closure in 2018. No royalties would be paid to the federal, state, or local governments. Industries to which Skyline Mine contributes indirectly would experience a decline in business and associated revenue. The impact would be major and long-term.
Greater Sage-Grouse	No direct or indirect impacts are expected as Proposed Action concerns continuation	There would be no direct or indirect impacts.

Resource	Proposed Action	No Action
	of underground mining. Subsidence impacts to Priority Habitat Management Areas (PHMA) would be negligible and not likely to be perceptible to sage grouse.	
Water Resources		
Surface Water	Direct impacts to surface water from subsidence would be unlikely, as an adequate overburden exists between the surface water and the mining void. Additionally, overburden consists of bedrock formations with very low permeability. Minor, short-term impacts on stream flow would continue.	No additional impacts as there would be no direct or indirect impacts.
Groundwater	Additional mining in the Project Area would not result in any long-term or short-term impacts on groundwater flow.	There would be no impact on groundwater.
Soils	There would be no surface disturbance. Subsidence may cause minor cracks and larger openings where potential soil loss could occur. Direct impacts on soils would be negligible and short-term. Indirect impacts from ongoing mining operations would be minor and short-term until reclamation is achieved.	There would be no impact from subsidence. Impacts from ongoing mining activities would be the same as the Proposed Action, minor and short-term until reclamation is achieved.

Resource mitigation measures can be found in the Flat Canyon Coal Lease Tract FEIS (US Forest Service, 2002a) and this document does not offer additional mitigation measures.

4.2 Topography and Geology

4.2.1 Proposed Action

A probable maximum of 42 million tons of mineable coal would be recovered from federal lands and another 5 million from private land through underground mining with the approval of the mining plan modification. Removal of the coal would affect the geologic structure in the Project Area.

4.2.1.1 Direct Impacts

Surface subsidence from extraction of the underground coal seams, would result in changes to topography depending upon rock strength, discontinuities, stress, thickness, and types of overburden, topography, mining methods and orientation, and the thickness of the coal seam extracted. Models (adjusted to local conditions based on monitoring) developed adjacent to the Project Area have improved the accuracy of subsidence predictions. Skyline Mine predicted the subsidence associated with the Flat Canyon Federal Coal Lease Tract UTU-77114 to be a maximum of two feet (Canyon Fuel Company, LLC, 2015). The lease includes a stipulation that requires mining to be done in a manner that prevents surface subsidence that would cause

hazardous conditions, result in damage to existing surface structures, or damage the flow of perennial streams (BLM, 2015d).

The likelihood that horizontal tension fractures from subsidence would develop is low, as the majority of mining would be conducted in single-seam mining. Observations of subsidence at the Skyline Mine from past mining have not found large tension fractures to be common and those were mitigated. **Section 4.5** further discusses the Probable Hydrologic Consequences report (Petersen Hydrologic, LLC, 2014a), which presents information supporting the low likelihood of significant subsidence to occur. Impacts to topography due to subsidence would be negligible and long-term.

4.2.1.2 Indirect Impacts

There would be no indirect impacts on topography and geology under the Proposed Action.

4.2.2 No Action

4.2.2.1 Direct Impacts

Under the No Action, no coal would be recovered from the Flat Canyon Federal Coal Lease Tract UTU-77114 or the adjacent private lands with non-federal coal reserves. Even if an underground right-of-way were granted through the Flat Canyon Coal Lease Tract UTU-77114 for the purpose of mining the private reserves, it is unlikely that it would be economical to develop access tunnels the distance needed to reach the small amount of recoverable private coal reserves using the methods the Skyline Mine proposes. Subsidence from mining remaining accessible areas would be negligible.

There would be no direct long- or short-term impacts on topography.

4.2.2.2 Indirect Impacts

There would be no indirect impacts on topography under the No Action.

4.3 Air Quality and Climate Change

Direct impacts are those from activities including mining the coal in the Flat Canyon Federal Coal Lease Tract UTU-77114, moving the coal to the stockpile and the CH₄ emissions in the stock pile attributable to the Flat Canyon coal.

Indirect impacts result from taking coal from the stockpile, processing, and shipping it, as are all other mining activities at the Skyline Mine. Indirect impacts include CH₄ released from the stockpiles attributable to coal mined at the Skyline Mine other than the Flat Canyon coal. Indirect impacts also include transportation of the coal from Skyline Mine and coal combustion.

4.3.1 Proposed Action

4.3.1.1 Direct Impacts

Criteria Pollutants

Operations and Tailpipe Emissions

At Skyline Mine, direct mining-related air quality impacts would include fugitive dust emissions from coal handling and wind erosion of coal and other material stockpiles. The location, amount, and types of emission sources would not change from current permitted operations. The Proposed Action would extend these impacts by 9 to 12 years.

Coal would be mined underground, transported by underground conveyor and stockpiled. Fugitive dust from stockpiles is controlled by naturally occurring 8.5 percent moisture content and, when moisture content drops below 4 percent, process source emissions are controlled with a filter baghouse (HDR Engineering, Inc., 2015).

The Proposed Action would extend the life of an underground mine and coal storage in stockpiles (see Section 2.2), such as it has been since 1981. Emissions associated with permitted sources would continue for approximately 9 to 12 years. Skyline Mine is currently operating under Approval Order DAQE-AN00092007-03 (DEQ, DAQ, 2015). As Skyline Mine's current Approval Order covers proposed activities in the Flat Canyon Federal Coal Lease Tract UTU-77114, the UDAQ does not anticipate that the mine plan would result in emissions that would adversely affect human health or the environment. The proposed modifications would not alter the current production limits allowed under the Approval Order.

Table 15 shows the outcome of the inventory for operations currently permitted under Approval Order DAQE-AN00092007-03 (UDAQ, 2015b). An inventory is sufficient to demonstrate compliance with the NAAQS (per *UDAQ Air Quality Rule R307-410-4 Modelling of Criteria Pollutant Impacts in Attainment Areas*, because (except for PM₁₀) emission would not come near to the limits establishing the need to model emissions. Emissions below these limits are presumed not to pose a threat to exceeding the NAAQS and therefore no modeling is required.

Table 15. Regulated Pollutants Evaluated for Air Quality Permit

Pollutant	Potential to Emit Facility Total (tons/year)	Requiring modeling per Air Quality Rule R307-410-4 ⁽¹⁾ (tons/year)
PM ₁₀	22.90	5 fugitive, 15 non-fugitive
PM _{2.5}	5.01	NA
NO _x	12.33	40
CO	10.36	100
SO ₂	0.07	40
VOC	0.68	NA

Source: (HDR Engineering, Inc., 2015). Operations included in the inventory are, natural gas fired heaters, natural gas fired boilers, conveyor transfer points, crushing operations, screening operations, rail/truck loading, stockpiling, stockpile conveyor transfer, truck loading, truck traffic, and truck traffic rail loadout.

(1) <http://www.rules.utah.gov/publicat/code/r307/r307-410.htm>.

The AERMOD model results for potential to emit PM₁₀ is 147 micrograms per cubic meter, which is below the NAAQS of 150 micrograms per cubic meter (**Table 5**). The modeled PM₁₀ impact of 99 micrograms per cubic meter, combined with distant background of 48 micrograms per cubic meter (see Section 3.3.1.3) is lower than the applicable NAAQS of 150 micrograms per cubic meter (**Table 5**); therefore, Skyline Mine is in compliance with the standard.

Fugitive Sources

Emission sources at Skyline are predominantly fugitive in nature. Sources include conveyor transfer points, stockpile storage, truck, and railcar loading. Fugitive sources are included in **Table 15**.

There are multiple storage piles at various locations on the mine property, which contribute to windblown fugitive emissions. Covered conveyors are used to transport coal around the mine. Truck hauling at the mine is only allowed by the air permit when the conveyor system is not operational. Calculations of particulate matter emissions from wind erosion of the coal stockpile used the factors from EPA. The analysis assumed each stockpile would have a maximum of 5 percent of the surface disturbed in any 24-hours. Surface disturbance includes surface grading and stockpile management. Emissions from placing in or removing coal from the stockpile were calculated as transfer point operations. Because the stockpiles are not used for daily coal production, this method provides a conservatively high calculation (HDR Engineering, Inc., 2015).

Calculation of particulate emissions were estimated for the haul roads from the haul trucks entering and exiting the mine for coal loadout. There are three truck loadouts located at the mine. The truck loadouts are comprised of a semi enclosed structure. (HDR Engineering, Inc., 2015).

Process Emission Sources

The Skyline Mine includes several process sources of emissions through the mine conveyor system, which are included in **Table 15**. The emission sources consist of two crushers, two screens, multiple storage silos and bins, fifteen natural gas space heater, and two boilers. The majority of coal produced is directly transferred by conveyor through the system to the rail loadout where it is transported offsite after being loaded on to railcars. Dust emissions associated with the process emissions are controlled with 5 filter baghouses, two at the run of mine silo, one at a crusher, two at storage silos, and one at a rail loadout (HDR Engineering, Inc., 2015).

Tailpipe Emissions

Transportation of coal around the mine is by covered conveyor. Truck hauling at the mine is only allowed by the air permit when the conveyor system is not operational. Tailpipe emissions were estimated for the haul trucks entering and exiting the mine for coal loadout. There are three truck loadout locations located at the mine. The access road to the mine is paved and primarily used by employees coming to and from the mine using typical passenger vehicles.

Total Emissions

Using the assumptions and processes described above, emissions were calculated for criteria pollutants and HAPs (**Table 16**). This information is summarized from the NOI to Construct (HDR Engineering, Inc., 2015) for a completed project and is assumed represent the maximum direct

emissions from mining Flat Canyon. Overall impacts would be negligible and last for 9 to 12 years. There would be no change in the attainment status of the airshed.

The haul road is primarily unpaved road with the exception the access point from the public road that is paved. Emissions were calculated using EPA factors (HDR Engineering, Inc., 2015). Water is used as a dust suppressant, which reduces the dust emissions by 75 percent. Trucks will use the haul roads at the rail loadout and stoker area which are paved.

Table 16. Skyline Mine Criteria Pollutant Emission Calculations (tons per year)

Source	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC
Fugitive	13.29	2.45	NA	NA	NA	NA
Process	9.61	2.55	12.33	10.36	0.07	0.68
Tailpipe ¹	0.019	0.017	0.796	0.225	0.000	0.039
Total Annual Emissions²	22.92	5.02	13.13	10.59	0.07	0.72

Source: (HDR Engineering, Inc., 2015)

1 Tailpipe Emissions are calculated using EPA Emission facts, Average In-Use Emissions from Heavy-Duty Trucks Table 2 GVW Class VIIIb. Tailpipe emissions are only calculated for the haul trucks that operate onsite.

2 Total Annual Emissions will be slightly higher than the emissions identified for the facility in the Approval Order with the inclusion of Tailpipe emissions. Tailpipe emissions are not estimated in the NOI and are not provided in the Approval Order.

PM₁₀ and PM_{2.5}

Particulate matter emissions from wind erosion of coal stockpiles used the factors from EPA. The analysis assumed each stockpile would have a maximum of 5 percent of the surface disturbed in any 24-hours (**Table 16**). Surface disturbance includes surface grading and stockpile management. Emissions from placing in or removing coal from the stockpile were calculated as transfer point operations. Because the stockpiles are not used for daily coal production, this method provides a conservatively high calculation (HDR Engineering, Inc., 2015). The stockpile and mine tube staker combined are 7.3 acres. Canyon Fuel Company provided a PM₁₀ modeling analysis as part of their air application package and results indicate that the maximum predicted concentration of PM₁₀ would total 147 µg/m³, below the NAAQS concentration of 150 µg/m³ (HDR Engineering, Inc., 2015). The modeling was done using AERMOD version 14134.

NO_x, CO, SO₂, and VOC

In 2015, as part of the air permit, an emission inventory was completed on the mine's operations potential to emit (HDR Engineering, Inc., 2015). NO_x, CO, SO₂, and VOC emissions were estimated for the combustion sources located at the mine (**Table 16**). These emissions sources are comprised of fifteen natural-gas space heaters located at various locations throughout the mine, and two natural gas-boilers that are used for heating the mine shop building.

Black Carbon Emission Estimates

Black Carbon is a subset of the PM₁₀/PM_{2.5} emissions associated with diesel fuel combustion. Black carbon is effective at absorbing light and has a disproportionately larger impact on visibility degradation compared to other forms of particulate matter.

Black Carbon has been calculated as a percentage of PM_{2.5} emissions associated with the diesel fuel combustion of the coal transportation off site (Cai & Wang, 2014). The calculated black carbon emissions are based on the emissions associated with the diesel haul trucks that transport coal offsite.

Amounts emitted are not regulated and, therefore, not measured. Black carbon emissions from diesel fuel would be negligible as seen in **Table 17**.

Table 17. Black Carbon Emissions (tons per year) from Haul Trucks, Proposed Action

PM _{2.5}	Black Carbon Ratio	Black Carbon Emissions
0.017	0.56	0.0097

Source: Table 8. (Cai & Wang, 2014).

Black carbon and GHG emissions have been linked to climate impacts such as increased temperatures. Black carbon is a by-product of incomplete combustion of fossil fuels, biofuels, and biomass, and can be emitted from the tailpipes of diesel engines at Skyline Mine. Black carbon is an unregulated pollutant.

Because these negligible impacts on air quality would occur for the duration of the project, they are long term. Although it is possible to calculate the direct emissions of criteria pollutants from mining and processing coal under the Proposed Action, they would not be discernable or measure at any of the regional monitoring locations.

HAPs

Utah Administrative Code R307-410-5 requires any source submitting an NOI, which proposes to increase HAP emissions, evaluate the emission increase with respect to Acute Emission Threshold Values (ETVs) to determine if dispersion modeling is required. The Skyline will not increase HAP emissions because no sources of combustion will change from the Proposed Action. The total potential to emit of formaldehyde was evaluated with respect to the ETV for formaldehyde in order to provide a conservative estimate. Formaldehyde, a HAP, is estimated at 0.002 pounds per hour, well below the “worst-case” Acute Emissions Threshold Value of 0.0140. Because the potential emissions are lower than the worst-case ETV, no further analysis is required. Likewise, dispersion modeling is not required according to the Utah Administrative Code R307-410-5.

Because the potential emissions are lower than the worst case ETV, no further analysis is required.

The majority of HAPs emitted would be the result of vehicle use. The major source threshold for HAPs is 10 tons per year of any one HAP or 25 tons per year of aggregate HAPs. The Skyline Mine would not be categorized as a major source for HAPs because the mine produces a maximum of 0.23 tons per year of total HAPs (HDR Engineering, Inc., 2015).

There would be negligible, long-term impact from the emission of HAPs because they would be at the lower limits of detection.

GHG

GHG emissions may be comprised of any combination of emissions of CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). GHG

emissions are calculated on a carbon dioxide equivalency (CO₂e) basis and CEQ's draft guidance (CEQ, 2014) recommends 25,000 metric tons of annual CO₂e emissions before analysis is recommended.

Under the CAA, an assessment of the potential impacts on climate change or an assessment of GHG emissions is not required, due to the minor GHG emissions. GHG emissions are required to be addressed in accordance with the Revised Draft Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Impacts of Climate Change in NEPA Reviews; Notice (FR December 24, 2014). GHG emissions may be comprised of any combination of emissions of CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). GHG emissions are calculated on a CO₂ equivalency (CO₂e) basis. CEQ's draft guidance (CEQ, 2014) recommends 25,000 metric tons of annual CO₂e emissions before a quantitative analysis is recommended.

As presented in **Table 16**, the potential to emit for CO₂e is 14,893 tons per year (from space heaters and boilers), which is less than the reference level established in the guidance. Consequently the mine plan modification will have no significant impact or impact on GHG annual emissions associated with the inventoried sources listed in the Approval Order.

Each regulated GHG has an associated global warming potential. Global warming potential (how much energy the emissions of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of carbon dioxide) was developed to allow for direct comparisons of global warming impacts of different gases. CO₂ is used as the reference gas and therefore has a global warming potential of 1. According to the EPA (EPA, 2016f), CH₄, and N₂O have global warming potentials over 100 years of 28 and 298, respectively. All associated GHG emissions are multiplied by each applicable global warming potential and aggregated together to obtain a final value of carbon dioxide equivalent (CO₂e) in units of metric tons.

The potential to emit CO₂e from Skyline Mine operations (HDR Engineering, Inc., 2015) is 14,893 tons per year. The emissions indicated the CO₂e from space heaters and boilers for comfort heating and is not associated with mining activities. As stated in Section 3.3.2, this level is below the 25,000 metric tons reporting limit established by EPA. Based on emission estimates for the Skyline Mine (HDR Engineering, Inc., 2015), no GHG reporting or permitting would apply because CO₂e emissions would be less than 100,000 tons per year and the mine is not a major source for other pollutants (see Section 3.3.1.2). GHG emissions reporting does apply to the facilities where coal from Skyline Mine would be used and future GHG permitting could apply for future modifications (if any). Impacts from GHG would be negligible, lasting from 9 to 12 years.

Methane Emissions from Coal Extraction

CH₄ emissions were calculated in the Notice of Intent for Construction (HDR Engineering, Inc., 2015). Potential sources identified that emit CH₄ are natural gas-fired heaters in the rail loadout building and the one of the transfer points (BC-13 reclaim). No CH₄ emission sources were identified for conveyors, crushers, screening, loadout facilities (other than the heaters), truck loading, transfer points, or stockpiles, or emissions were not calculated.

Skyline Mine (Skyline Mine, 2015) reports that in 2015, the direct surface coal extraction at the mine released 17.3 tons of CH₄. This amount is equivalent to 364 metric tons of CO₂e. The CH₄ release was calculated using samples that were collected at monitoring points located at, Portal #1 - #5, Trespass Portal, BC-2 Portal, and Winter Quarters Portal. The CO₂e from the emissions inventory and the methane release from mining totals 15,257 metric tons of CO₂e emissions per year.

Another way to assess the potential impacts on GHG emissions is to use EPA emissions factors and the maximum mining rate of 8 million tons per year identified in their air permit. These calculated emissions are shown in **Table 18**. These calculations do not represent the mine's actual emissions under current or proposed operations, nor do they represent the mine's reporting requirements.

Table 18. Direct GHG Emissions (metric tons per year), Maximum 8 Million Tons

Activity	CO ₂	CH ₄	N ₂ O	CO ₂ e
Truck Transport Loadout	21.5	.005	.0002	21.67
CH ₄ Release Post Mining	--	2,144	--	15,008
CH ₄ Release Mining	--	4,288	--	107,200
Total	21.5	6432	.0002	122,229

The direct emission of GHG would be negligible based on the measured emissions. GHG effects on the climate are long-term.

4.3.1.2 Indirect Impacts

Criteria Pollutants

Operations

Indirect air quality impacts at the mine complex would include exhaust from combustion sources (i.e. trucks, maintenance equipment, and other motor vehicles). Ventilation emissions from the mine and coal preparation facility would also occur. These sources would continue to contribute CO, NO_x, SO₂, and PM. However, these emissions would remain below levels as allowed under Skyline Mine's current Approval Order.

Precursors of O₃ including NO_x and VOCs are generated by the combustion of coal. O₃ impacts from coal combustion are not quantifiable because Skyline Mine ships coal to many consumers which change over-time which creates high uncertainties and an inability to analyze indirect emissions. Emissions were estimated using EPA AP-42 emission factors for Bituminous and Subbituminous Coal Combustion (**Table 19**).

Table 19. Ozone Precursor Emissions Rates Based on the Maximum Annual Coal Mined Production Limit

Coal Combustion Rate (tons per year)	NO ₂ (tons per year)	VOC (tons per year)
8,000,000	29,600	240

Tailpipe Emissions Sources

Tailpipe emissions would be the same as the direct impacts.

Rail Transportation

Indirect emissions were estimated based on the largest, single, US-based power plant consumer of Skyline Mine coal in 2015 as presented in **Table 2**, the Intermountain Power Project located in Millard County, Utah. Intermountain Power Project is used as a representative coal-fired power plant to quantify potential indirect emissions. The actual future coal destination as part of the Proposed Action is unknown because the distribution of coal from Skyline Mine varies every year (see **Table 2**).

The Intermountain Power Project is owned and operated by Intermountain Power Service Corporation. In 2015 Skyline Mine had shipped 909,840 tons of coal to Intermountain Generation Station; Intermountain used approximately 5,445,459 tons of coal in 2015 (Energy Information Administration, 2016a). The Skyline Mine accounts for approximately 16.7% of the total coal that was used at Intermountain Power Project in 2015.

The rail emissions are estimated on an annual shipping rate of four million tons per year (**Table 20**). The four million tons shipped was used as a conservative estimate. Four million tons per year is an approximate average of the amount of coal that Skyline produces annually. The mass of coal per an individual railcar is assumed to be 100 tons. A conservative estimate of 110 railcars was used to estimate the potential maximum number of railcars that could be associated with the coal train. This equates to 11,000 tons of coal per rail shipment. The maximum number of annual shipments is 364. It was assumed that three engines would be associated with each coal train rated at 4,000 brake/engine horsepower per engine.

Table 20. Railcar Criteria Pollutant Emissions

Pollutant	Emission Factor (grams/brake horsepower-hour) ¹	Emissions (tons per year)
PM ₁₀	0.015	0.294
PM _{2.5} ²	0.01	0.285
NO _x	1.00	19.60
CO	1.28	25.09
SO ₂ ^{3,4}	Mass Balance	0.0005
VOC	0.04	0.78
Black Carbon ⁵	0.77	0.23

¹ Unless otherwise noted, these emission factors are from Table 1 of EPA's Emission Factors for Locomotives dated April 2009. Tier 4 factors.

² PM_{2.5} emissions are estimated to be 0.97 times PM₁₀ emission per EPA's Emission Factors for Locomotives publication April 2009 (page 4).

³ Emission (tpy) = annual engine load (bhp-hr/yr) x BSFC (British Thermal Unit/hp-hr) x density (lb/gal) x Fuel S-content (ppm S/10⁶) x MW ratio (lb SO₂/lb S) / (heating value (Btu/gal) x conversion (lb/ton))

⁴ SO₂ fuel content is 15 ppm; bsfc = 7,000 Btu/hp-hr, heating value of 137,000 British Thermal Unit/gal, density = 7.05 lb/gal Molar weight ratio = 2.0 lb/SO₂/ lb S

⁵ Appendix 2 of the EPA Report to Congress on Black Carbon 2012 indicates black carbon to be 77% of total PM <https://www3.epa.gov/blackcarbon/2012report/Appendix2.pdf>

⁶ EPA Climate Leaders Greenhouse gas Inventory Protocol Core Module Guidance, Optional Emissions From Commuting, Business Travel and Product Transport may 2008

A one-way haul distance was estimated at 163 miles with an assumed maximum speed of 80 mph for freight trains. Emissions were calculated for the roundtrip assuming this distance each way. Based on this scenario, the maximum annual operating hours of the train is 1,482. The emissions were determined on an annual power usage, which is 17 million brake horsepower-hours.

HAPs

Indirect HAPs from operations would be the same as the direct impacts. In addition, mercury would be emitted from coal combustion.

Mercury emissions from burning coal depend on control strategies and equipment used to minimize emissions and the quality and characteristics of the coal. The final destination of the Skyline Mine's coal varies annually and frequently includes many different destinations. The indirect mercury emissions from combustion of the Skyline Mine coal cannot consider specific control strategies and equipment. Instead, indirect emissions were estimated based on the largest, US-based power plant consumer of Skyline Mine coal in 2015 as presented in **Table 2**, the Intermountain Power Project. The actual mercury emissions from coal mined from the Flat Canyon Federal Coal Lease UTU-77114 will depend on the final destination and emissions control technology and permit requirements at those facilities.

In 2015, approximately 910,000 tons (equivalent to approximately 25 percent of Skyline Mine's 2014 production) of Skyline Mine's coal was shipped to the Intermountain Power Project. Using the 2015 Intermountain mercury stack test data, the Unit 1 mercury emission factor of 0.156 pounds/10¹² British thermal unit was used in the calculation (Intermountain Power Service Corporation, 2015). Unit 1 will generate more mercury emissions than Unit 2 which has a lower sampled emission rate. The 910,000 tons delivered in 2015 constituted approximately 17 percent of the total coal consumed by the Intermountain Power Project. Based on an average annual production at Skyline of 4 million tons (8 billion pounds), the mercury emissions from burning 100 percent Skyline Coal in the Intermountain Power Project generating stations would be 14 pounds per year, or 166 for the probable maximum total 47 million tons of coal in the proposed action. These impacts would be negligible and long-term.

GHG

Coal Combustion

Indirect air quality impacts also occur with coal combustion. Coal-fired power plants have a known association with GHGs, mercury, and selenium emissions.

In 2015, the EPA finalized a rule revising regulations for steam electric power plants. Based on technological improvements (particularly at coal-fired plants), the rule sets limits on toxic metals, nutrients, and other pollutants (e.g., arsenic, lead, mercury, selenium, chromium, and cadmium) in wastewater that can be discharged from power plants. The rule is projected to reduce the amount of targeted pollutants by 1.4 billion pounds (EPA, 2015b).

EPA introduced the Greenhouse Gas Reporting Program in 2010. The program collects GHG data from forty-one source categories. Most industries began reporting for 2010; additional industries began reporting for 2011. The regulations also provided a standardized means to assess and

calculate GHG emissions. These calculation methods were codified in 40 CFR Part 98. For the calculation of combustion emissions the methods. These emissions calculations are an approved method for tabulating GHG emissions for the most common GHGs. The emissions are not dependent on emissions location or combustion type and provide both speciated and CO₂e emissions. CO₂e is a quantity that describes, for a given mixture and amount of GHG, the amount of CO₂ that would have the same global warming potential.

The EPA provides prepopulated spreadsheets for the calculation of stationary fuel combustion, which are based on their approved methodologies for GHG reporting. These spreadsheets were used to assess the total GHG emissions from combustion of the coal produced by mining the Flat Canyon Federal Coal Least Tract. CO₂e produced per ton of coal is 1.8846 metric tons.

By using the CO₂ GHG emissions calculation method found in 40 CFR Part 98 Mandatory Green House Gas Reporting, Subpart C General Stationary Fuel Combustion, Calculating GHG Emissions, Equation C-1, the emissions factor of 95.52 kilograms of CO₂ per million British thermal unit can be used to estimate emissions assumed from burning bituminous of coal in a power plant. (**Table 21**) for the total coal from the Flat Canyon Federal Coal Least Tract UTU-77114 (approximately 42 million tons) and the associated 5 million tons of private coal. The values detailed in **Table 21** represent three separate components. The first presents the total GHG emission impacts from the combustion of average annual rate of production (first row). These emission impacts would occur over the life of the mine until 2017. The second represents the maximum annual emissions assuming that all mined coal (at the maximum mining rate) is combusted in one year (second row). The third row shows total consumption of all the maximum probable amount in the Flat Canyon Federal Coal Lease Tract UTU-77114.

Table 21. GHG Coal Combustion Emissions, Proposed Action

	Coal Combusted (Short Tons)	CO₂ Emissions (Metric tons)
Anticipated annual production range	3 million to 4.5 million	5,653,800 to 8,480,700
Maximum allowable under the Approval Order	8.0 million	15,076,877
Total Coal	47 million	88,576,651

Tailpipe Emissions

Tailpipe emissions of criteria pollutants would be the same as the direct impacts.

Rail Transportation

Transportation emissions for the indirect emissions were not calculated for the indirect impact of coal movement for rail. The transportation distance is not identifiable because the final location of the coal varies. Railroad transportation emissions require that the haul distance be used to estimate emissions. Indirect emissions were estimated based on the rail distance to the single, largest, US based power plant consumer of Skyline Mine coal in 2015 as presented in **Table 2** Intermountain Power Project. The actual future coal destination varies from year to year and it is uncertain where Skyline Mine coal will be consumed.

GHG emissions from diesel-fuel trains hauling coal were estimated using the same assumptions listed above for the criteria pollutants.

Table 22 Rail Transport GHG Emissions

GHG	Emission Factor (pounds per mile)	Emissions (tons per year)
CO ₂	0.055	36,147
CH ₄	0.0000044	2.87
CH ₄ , CO ₂ e		71.85
N ₂ O	0.0000013	0.86
N ₂ O, CO ₂ e		256.94
CO ₂ e		36,476

EPA Climate Leaders Greenhouse gas Inventory Protocol Core Module Guidance, Optional Emissions From Commuting, Business Travel and Product Transport may 2008

4.3.2 No Action

Under the No Action, emissions would not be released from within the federal coal lease area or the associated private lands as no coal would be recovered.

4.3.2.1 Direct Impacts

As the Flat Canyon coal would not be mined and transported, there would be no direct impacts on criteria pollutants, HAPs, or GHG from the No Action.

4.3.2.2 Indirect Impacts

Permitted emissions from the operations at the surface facilities complex would continue until the mine closes in about 2018 and then it would end. Air quality would continue to meet existing permit requirements and state and federal standards through the current mine plan for the life of the mine.

Criteria Pollutants

Under the No Action, direct impacts from coal stockpiling and transportation of non-Flat Canyon coal would produce criteria pollutant emissions at current emissions rates. Overall impacts would be negligible and last until 2018.

HAPs

The indirect impacts on HAPs under the No Action would be the same as those described under the Proposed Action except that the impacts would occur for a shorter duration (through 2018). These impacts would be negligible and short-term.

GHG

Under the No Action, 14,893 tons of CO₂e would continue to be emitted from mining activities through 2018. This would be a negligible impact. Impacts from rail transport would be the same as described under the annual indirect impacts of the Proposed Action.

Indirect GHG emission impacts from the No Action would be negligible and short-term.

4.4 Social and Economic

4.4.1 Proposed Action

Under the Proposed Action, the Proposed Action would be approved, and operation of the Skyline Mine would continue at its current level for up to 9 to 12 additional years.

4.4.1.1 Direct Impacts

Continued mine operation would extend the 320 jobs at the mine (with the exception of small variances based on production rates) and an undetermined number of support service jobs for 9 to 12 additional years. In 2015, Canyon Fuel Company spent approximately \$35,439,177 in gross wages including benefits. Approval of the mine plan modification would have a beneficial impact on employment and economic revenue in Sanpete, Carbon, and Emery counties. With current downsizing in the mine industry, there are several companies that rely on Skyline Mine including Badlands, Longwall Mining, Bookcliff Sales, Seetech, Morgantown, and United Central.

A probable maximum of 42 million tons of federal coal could be recovered at a total value of about \$1.6 billion, based on the approximate current average value as the coal leaves the mine (which does not include shipping) of \$40 per ton. Royalties to the Federal Treasury would amount to about \$134 million, the State of Utah would receive about \$67 million, and \$33 million could be dispersed to the counties including Sanpete, Carbon, and Emery counties. In the past, Skyline Mine has averaged \$14 million per year in royalty payments. Impacts would be considered minor (because they are an extension of the existing condition), beneficial, and long-term. Royalties are not paid to the Federal Treasury on the privately owned coal.

4.4.1.2 Indirect Impacts

Indirectly, mine plan modification approval would benefit numerous service industries including real estate, temporary employment, mining supplies, automotive supplies, office supplies, plumbing, heating-and-air conditioning, and construction. Skyline Mine also contributes to student enrollment at local schools and funding for social services.

Social Cost of Carbon

The EPA and other federal agencies estimate the social cost of carbon (SC-CO₂) to calculate the climate benefits of rulemakings and for use in cost-benefit analyses of proposed regulations that could impact cumulative global emissions. Calculating the SC-CO₂ is a way to estimate the economic damages associated with a small increase in carbon dioxide (CO₂) emissions. The calculated dollar cost of a metric ton of CO_{2e}, typically expressed as one million tons in a single year, represents the value of damages avoided for an associated carbon emissions reduction.

According to the EPA: *“The SC-CO₂ is meant to be a comprehensive estimate of climate change damages and includes changes in net agricultural productivity, human health, property damages from increased flood risk, and changes in energy system costs, such as reduced costs for heating and increased costs for air conditioning. However, given current modeling and data limitations, it does not include all important damages. The models used to develop SC-CO₂ estimates, known as*

integrated assessment models, do not currently include all of the important physical, ecological, and economic impacts of climate change recognized in the climate change literature because of a lack of precise information on the nature of damages and because the science incorporated into these models naturally lags behind the most recent research. Nonetheless, the SC-CO₂ is a useful measure to assess the benefits of CO₂ reductions.” (EPA, 2016g).

OSMRE did not apply the SC-CO₂ protocol in this analysis because the purpose of an environmental assessment is to determine whether to prepare an environmental impact statement or a finding of no significant impact (43 CFR Part 46 Subpart D). Specific threshold levels for the determination of significance based on cost or benefit have not been established. Also, NEPA does not require a cost-benefit analysis or the presentation of the social cost of carbon estimates quantitatively. Without a complete monetary cost/benefit analysis, which includes the social benefits of energy production and climate change, calculating only the cost of carbon would be misleading.

4.4.2 No Action

4.4.2.1 Direct Impacts

Under the No Action, the life of Skyline Mine would not be extended beyond the current projection of 2018. The beneficial impacts described under the Proposed Action would end.

The probable maximum of 42 million tons of federal coal would not be recovered under the No Action. In addition some of the reserves (approximately 5 million tons) are on adjacent private land (see **Table 3**). If the mine plan modification is not approved, none of the reserves could be recovered and it is highly unlikely that it would be mined in the future by the Skyline Mine. Access from any other location would not be economical due to the costs of developing alternative portal facilities on adjacent lands and the small amount of coal in the private reserves.

With the closure of Skyline Mine, 320 jobs at the mine and an undetermined number of associated jobs in the community would be lost. Additionally, no royalties would be paid to the federal, state, or local governments. Wages and benefits, Abandoned Mine Land fees, royalties, and property tax revenue from mining would be eliminated if mining did not continue. The estimated potential revenue to the counties would not be distributed by the State. The Permanent Community Impact Board, which has been a major source for infrastructure projects in rural counties, would also receive less funding. The No Action constitutes a major, long-term impact to the social conditions and economics of the local area and a lesser impact to the State of Utah.

4.4.2.2 Indirect Impacts

Without continued operation of Skyline Mine, industries to which the mine contributes indirectly would incur a decline in business and associated revenue. These industries include retail, accommodations, and real estate. With the loss of 320 high-paying jobs, houses would likely flood the market and school enrollment would decline as mine workers and their families leave the area. Additionally, with the downturn in the mining industry, local communities would likely need to consider raising revenue through other means to maintain the same level of social services. The No Action would have a major, long-term impact local businesses, schools, and social services. These impacts would be major and long-term.

4.5 Greater Sage-Grouse

4.5.1 Proposed Action

Removal of the coal would not affect rare plants, fish, and wildlife, including Greater Sage-Grouse, as all mining would occur underground. No surface disturbance would occur.

Direct Impacts

The Proposed Action would not directly affect greater sage-grouse as all activities would be underground. When consenting to new underground coal leases, the Land Management Plan Amendments and Approved Resource Management Plan Amendments prohibit the placement of surface facilities on federal land in Priority Habitat Management Areas. Because no new surface facilities would be located within Priority Habitat Management Areas, disturbance and density limits would not apply and the Proposed Action is consistent with the greater sage-grouse Land Management Plan Amendments for Utah and the Utah Approved Resource Management Plan Amendments. There would be impacts on sage-grouse.

Indirect Impacts

No indirect impacts on greater sage-grouse or Priority Habitat Management Areas would occur. Estimated subsidence areas (as shown on **Figure 8**) encompass approximately 18.9 acres within the Priority Habitat Management Areas. As the Priority Habitat Management Areas within the subsidence zone is minimal and on the edge where subsidence would be reduced there would be no impacts because they would not be detectible. As analyzed in the 2002 FEIS and described in **Section 3.5**, there would be no impacts on general vegetation due to subsidence. Greater sage-grouse use of the Priority Habitat Management Areas would not be altered by subsidence-related surface cracks. If cracks occur, they would be negligible changes to the ground surface and would not result in sage grouse avoiding the area. There would be no impact on greater sage-grouse.

There would be no noise impacts on greater sage-grouse because all activity in the Project Area would be underground. The closest leks are more than 9.8 miles away. No lek buffers, noise restrictions, or seasonal restrictions would be required. There would be no indirect impacts on sage-grouse.

4.5.2 No Action

There would be no direct or indirect impacts on sage grouse because no sage grouse habitat occurs within the current mine subsidence area.

4.6 Water Resources

4.6.1 Proposed Action

4.6.1.1 Direct Impacts

Surface Water

Impacts on water resources are evaluated based on the potential for subsidence and mine water discharge.

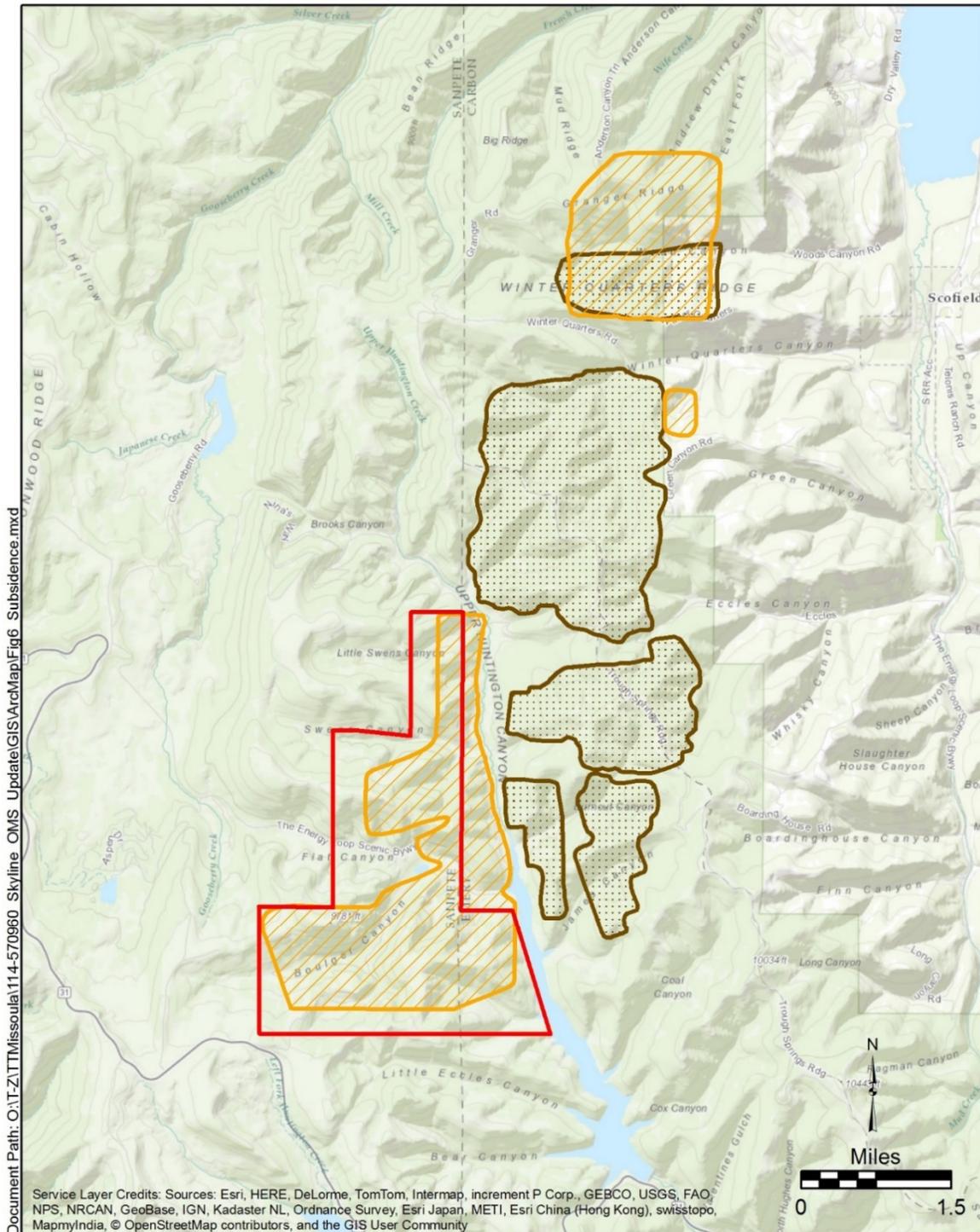
The geologic conditions, lithologies, and bedrock formations in the Project Area are similar to those in the current mine area. The deeper groundwater system of the Star Point Sandstone formation is not in hydraulic connection with the land surface or the shallow alluvial or colluvial bedrock groundwater systems which support perennial stream flow and springs. As a result, mining at Skyline Mine has not affected surface water flow. Additional mining is not expected to result in any long-term or short-term impacts on surface water flow.

If subsidence results from mining activity and causes cracks to form on the surface in an area of a perennial stream, there is the potential for surface waters to be diverted, to pond, or for water to infiltrate to deeper groundwater systems. Skyline Mine predicted the subsidence to be a maximum of two feet (Canyon Fuel Company, LLC, 2015). As discussed in **Section 3.6.1**, mining at the Skyline Mine and associated subsidence has not impacted surface water flows. Petersen Hydrologic (2014a) reports that the potential for impacts to surface water from the upward migration of tension cracks at the Skyline Mine is low for the following reasons:

- The Society for Mining, Metallurgy, and Exploration Mining Engineers Handbook recommends a minimum vertical distance between the mine and an overlying waterbody or aquifer be 60 times the height of the mining void (SME, 2011). Since the mined coal-seams in the Skyline Mine are approximately 10 feet, the recommended best mining practices would suggest a minimum overburden of at least 600 feet would be sufficient to protect overlying water resources. The overburden at the Skyline Mine ranges from 900 to 2,300 feet, suggesting impacts to surface water or shallow groundwater systems from upwardly propagating fractures are not anticipated (Petersen Hydrologic, LLC 2014a).
- The bedrock formations which overlie the coal seams and that perch the shallow aquifer and perennial stream systems have very low permeability and are discontinuous. As a result, these formations are likely not capable of accepting or transporting appreciable quantities of water. Additionally, many of these formations contain swelling clays which would naturally heal cracks or fractures (Petersen Hydrologic, LLC 2014a).

Figure 10 shows past and predicted areas of subsidence. Because of the geology of the area, impacts to surface water resources have not occurred from subsidence phenomena for over 30 years of mining at the Skyline Mine (Petersen Hydrologic, LLC, 2014a). **Appendix B** provides results of water monitoring. Subsidence-related impacts on water resources are not anticipated with approval of the mine plan modification. Because of the stated conditions above, impacts to surface

Figure 10. Subsidence



- Legend**
- Project Area
 - Estimated Subsidence
 - Past Subsidence

**Past and Estimated Subsidence
Flat Canyon Mine
Plan Modification EA
Sanpete, Carbon, and Emery Counties, Utah**

water resources from potential subsidence cracks are not anticipated or would be negligible and self-healing.

Currently, discharges of pumped mine water from dewatering activities to Eccles Creek has been of good quality and meets water quality standards for the designated beneficial uses of the surface water. The 2002 FEIS reported that discharges of pumped mine water to Eccles Creek improved the water quality in Scofield Reservoir, which was listed in 2000 as an impaired water body for meeting water quality standards for phosphorous. Stream water quality and mine discharges are monitored under a UPDES permit which would continue through the life of the mine.

Spring and seep flow and water quality has been monitored since 1997 with no perceptible impacts to water quality (Petersen Hydrologic, LLC, 2014a). Approval of the Flat Canyon Mining Plan Modification would not result in any short or long term impacts to the quality of surface waters, groundwater, or springs. According to the 2002 FEIS, at closure surface water flow and quality would return to near pre-mining condition (US Forest Service, 2002a).

Industrial activities associated with mining have the potential to result in the spillage of fuels, oils and grease, or other potentially harmful compounds during equipment maintenance and operations, filling of storage tanks and vehicle tanks, or from storage tank leakage. The Skyline Mine operates under a Spill Prevention Control and Countermeasures Plan which specifies site-specific practices to prevent, control, and remediate potential spills and pollution from oil based substances. To date, no spills have been reported from normal mine activities that resulted in significant impacts to surface or groundwater quality. Practices to manage, mitigate, and report minor incidental spills of petroleum products, such as could occur from vehicles are defined in the plan and regulated by the EPA. With approval of the Proposed Action, the potential for impacts to stream or groundwater quality from potential spills is considered low.

Water quality standards would continue to be met. Impacts on water quality would be negligible and short-term.

As mining at the Skyline Mine progresses westward into the Flat Canyon Lease Tract area and on a downward dip, there is the potential to further intercept substantial faults and fractures in the Star Point Sandstone similar to those encountered in the early 2000s. Water could discharge from water bearing faults and fractures occurring in tongues of the formation immediately below the mine area. Therefore, there is the potential for inflows into the Flat Canyon Lease Tract area that are as large, or larger, than those previously encountered. This would result in increased pumping and dewatering requirements to continue mine operations.

Increased discharge rates to Eccles Creek could impact stream geomorphology in both Eccles Creek and Mud Creek downstream. A recent average discharge rate of 22 cubic feet per second (cfs) did not result in observable changes to stream geomorphology (Petersen Hydrologic, LLC, 2014a). However, studies have been conducted that show sediments in Eccles Creek would entrain and be transported at discharge rates approximating 35 cfs (15,700 gpm). A streamflow duration study showed that at a sustained discharge of 35 cfs, the number of sediment-transporting days would increase from 7 to 31 days in Eccles Creek and 13 to 20 days in Mud Creek (US Forest Service, 2002a). Potential increases to these levels or higher in the average annual discharge of

these creeks could cause streambank erosion, widening of the channel, a steepening of the channel gradient due to degradation of the substrate, bank sloughing or channel headcutting (US Forest Service, 2002a). Minor, short-term impacts on stream flow would continue.

Discharge is currently monitored (Petersen Hydrologic, LLC, 2014a). If dewatering increases to sustained higher discharges above 35 cfs, the monitoring program would be adjusted to document stream geomorphological parameters and characteristics. If needed, energy dissipation structures could be constructed to mitigate higher velocities associated with sustained higher discharges and prevent impacts to stream geomorphology. Water quality standards in streams that receive mine water discharge would continue to be met as a condition of the mine permit. Discharge permits are managed by the State of Utah and renewed on a five year cycle. Permit conditions are modified as needed to adjust to potentially changing conditions in the water quality or discharge rate of the discharge. There would be no impact compared to current conditions.

Groundwater

As discussed in Section 3.5, mining at the Skyline Mine and associated subsidence has not impacted groundwater flows (Petersen Hydrologic, LLC, 2014a). The expected overburden will generally be greater than 1,000 feet suggesting that impacts on shallow groundwater systems are not likely. Additional mining in the Project Area would not result in any long-term or short-term impacts on groundwater flow.

4.6.1.2 Indirect Impacts

Surface Water

Mine dewatering and discharges of groundwater to Eccles Creek creates a minor localized increases in stream flow in the Mud Creek watershed. Eccles Creek is well-armored and has shown little or no visual indication of erosional impacts (DOGM, 2013). No adverse impacts on water quality are being observed in Eccles Creek or Electric Lake, but any possible adverse trends are being documented (DOGM, 2013). There are no known uses or allocations of this localized minor increase in streamflow or identified impacts to water quality which could affect indirect impacts downstream. Consequently, indirect impacts from discharges of groundwater are not anticipated.

Power plants can emit mercury into the atmosphere with coal combustion. Mercury can affect the quality of surface water as it settles into streams and lakes through deposition or precipitation. Mercury can go through a series of chemical transformations that convert it to a highly toxic form which may concentrate in fish and birds (Irwin, 2007). However, mercury contamination through atmospheric deposition (see **Section 4.3.1.1**) is extremely difficult to determine as atmospheric mercury can be derived from any number of local, regional, or global sources. Thus, it is not possible to determine how much mercury would be deposited into surface water or where as an indirect impact of mining at Skyline Mine.

Groundwater

As discussed in Section 3.5, mining at the Skyline Mine and associated subsidence has not impacted groundwater flows (Petersen Hydrologic, LLC, 2014a). There would be no impact on groundwater.

4.6.2 No Action

4.6.2.1 Surface and Groundwater Flow

Direct Impacts

Under the No Action, there would be no additional impacts to surface or groundwater systems. Mining would stop in 2018, and mine water discharge would no longer augment the flow in Eccles Creek.

Stream water quality and mine discharge monitoring would continue through the life of the mine. Spring and seep flow and water quality have also been monitored since 1997 with no perceptible impacts to water quality (Petersen Hydrologic, LLC, 2014a). If the mine plan modification is not approved there would be negligible impacts on the quality of area surface waters, groundwater, or springs. Additionally, the potential for impacts to area stream water or groundwater quality from potential spills from continued operation of mine activities would be negligible and short term.

With no additional mining, and continued mining to the end of the current mine plan, no additional impacts to stream channel morphology in either Eccles Creek or Mud Creek would occur. Because the potentiometric surface is expected to recover to approximate pre-mining conditions after mining ceases, the overlying unsaturated zone should also be expected to recover to approximate pre-mining conditions (DOGMA, 2013). There would be no long-term impacts.

Indirect Impacts

No indirect impacts from the No Action were identified. If the mine modification plan is not approved, indirect impacts associated with power plant coal combustion would continue until 2018. After this date, indirect impacts from Skyline Mine would cease; however, power plants would presumably obtain coal from other sources.

There would be no indirect impacts on mine dewatering discharges from the no action.

4.7 Soils

Impacts on soils are evaluated due to subsidence and past disturbance at the mine site.

4.7.1 Proposed Action

Under the Proposed Action, mining production activity would continue solely underground. No changes in mining methods or rates are proposed.

4.7.1.1 Direct Impacts

If subsidence results from mining activity and causes cracks or larger openings to form on the surface, there is the potential for soil to be lost if it falls into the subsurface either directly or after being washed into the opening by overland water flow. As discussed in **Sections 3.6.1, 4.2, and 4.6**, the potential for subsidence to occur to such an extent is negligible.

If subsidence does occur, it will likely be limited to a settling of the ground surface resulting in the formation of shallow depressions without the formation of tension cracks or larger openings to the subsurface (see **Section 4.2**). If such depressions did form it will be possible for adjacent soil to be washed into the depressions during periods of overland flow if vegetative cover was insufficient to prevent soil movement. This would result in an increase in soil depth within the depression and a corresponding decrease along its periphery. The extent of any soil movement would be limited by the presence of vegetation, frequency and severity of runoff events, and the depth and geometry of depressions formed by subsidence. The Flat Canyon Lease contains a stipulation requiring mining to be conducted in such a way as to prevent surface subsidence that would create hazardous conditions (including landslides) (BLM, 2015d). Impacts on soils would be negligible and short-term.

4.7.1.2 Indirect Impacts

Soil within existing soil stockpiles could undergo a reduction in productivity due to loss of soil structure, nutrients, and biological function and may also be subject to erosion. Drainage from mine site facilities is captured in sediment ponds and discharged after testing for toxicity, per the Mine and Reclamation Plan (Canyon Fuel Company, LLC, 2002). Impacts would be limited by BMPs such as revegetating the stockpiles until they are ready for use in reclamation.

Mine area reclamation will entail ripping soils regrading to a gradual slope, placing topsoil and revegetating to rangeland habitat, per the Mine and Reclamation Plan (Canyon Fuel Company, LLC, 2002). The mine also maintains a spill prevention control and counter measures plan to prevent and mitigate potential impacts from spilling hydrocarbon based products. Indirect impacts would be minor and short-term until reclamation is achieved.

4.7.2 No Action

4.7.2.1 Direct Impacts

Direct impacts could be the same as indirect. No additional direct impacts would occur from mining the Flat Canyon Federal Coal Lease Tract UTU-77114.

4.7.2.2 Indirect Impacts

Indirect impacts on soils from the No Action would be the same as the indirect impacts from the Proposed Action, minor and short-term until reclamation is achieved.

Chapter 5

Cumulative Impacts

5.1 Introduction

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time” (40 CFR 1508.7).

5.1.1 Analysis Areas

The geographic extent of cumulative impacts varies by the type of resources, resource issues, and by the intensity and timeframe of the potential impacts. Different special and temporal analysis areas for cumulative impacts are identified by resource.

5.1.2 Past, Present, and Reasonably Foreseeable Actions

Past and present coal mining and exploration activities were for the Skyline Mining Complex, with surface facilities located in Eccles Canyon to the north and east of the Project Area. Abundant coal reserves have resulted in past and present exploration activities and federal coal tract leasing in the region. Other mines in the cumulative impacts analysis area include a small gravel pit outside Huntington Creek watershed and a few small gypsum mines downstream from the confluence of Huntington Creek and San Rafael River (Galecki, 2016). Additionally, Carbon County’s oil and gas industry produces an average of 67,000 barrels of oil and 73,304,025 thousand cubic feet) of gas volume over the last four years (Utah Department of Natural Resources, 2016).

The Project Area and vicinity is a highly used recreation area of the Manti-La Sal National Forest, offering camping, hiking, boating, fishing, motorized sightseeing, hunting, snowmobiling, and cross-country skiing. The cumulative impacts analysis areas encompass canyons in the Project Area which provide recreation access: Upper Huntington Creek Canyon, Flat Canyon, Boulger Canyon, Eccles Canyon, Little Swens, and Swens Canyon. Recreational attractions in the cumulative impacts analysis areas include stream fisheries, reservoirs, roads, trails, developed recreation sites, cabins, a girl’s camp, and boat ramp facilities. With current population growth projections and the increasing popularity of outdoor recreation, it is likely that recreational use in the Project Area and vicinity will increase.

National Forest System Roads of the Manti-La Sal National Forest have also been used to support livestock grazing by private permittees. This activity is ongoing and will likely continue into the future.

5.2 Cumulative Impacts

5.2.1 Topography and Geology

The cumulative analysis area for subsidence-related impacts is the Project Area plus areas of past subsidence and an estimated area of future subsidence, as shown in Section 4.2.1.1. This area is of sufficient size to account for the minor and long term impacts to topography due to subsidence from mining the Flat Canyon lease. Subsidence has the potential to affect topography and geologic resources and water resources. Reasonably foreseeable actions identified (other surface mining operations, recreation and grazing) would not have impacts on topography and geology.

Cumulative impacts on topography and geology are the same as the direct and indirect impacts.

5.2.2 Air Quality and Climate Change

The cumulative impacts analysis area for air quality encompasses the state of Utah. For air quality, similar direct and indirect emissions would be associated with the Flat Canyon Federal Coal Lease UTU-77114 (due to implementation of the current air quality permit) are already occurring in the local environment. As such, any cumulative air quality impacts from past and present actions are reflected in the air quality monitoring data collected in Utah, and the cumulative air quality impacts are represented by the baseline air quality conditions described in Section 3.3.1.3. The future impacts are also reflected because they are limited by the air permit.

Utah Air Emission Sources

Table 23 summarizes the county-by-county data for Utah as compiled every three years (triennial) in 2011 (UDAQ, 2014). This is the most recent inventory available in May 2016. These data include point (industrial/commercial), on-road, off-road, area, biogenic (soil decay), and wildfire emissions.

Table 23. 2011 Triennial Inventory (tons/year)

County	PM ₁₀	PM ₂₅	NO _x	CO	VOC	SO _x
Beaver	2,655	436	2,079	13,876	26,490	75
Box Elder	10,313	2,121	7,366	40,012	38,771	163
Cache	10,854	1,647	3,842	22,511	13,437	172
Carbon	4,676	1,152	7,153	11,116	17,875	8,381
Daggett	604	94	1,324	3,858	8,386	2
Davis	7,601	1,807	9,368	38,462	12,718	474
Duchesne	6,912	1,082	11,934	19,793	57,798	144
Emery	5,390	1,133	22,212	30,835	36,805	7,246
Garfield	2,718	506	1,057	23,180	44,848	17
Grand	1,831	446	3,125	22,149	37,253	27
Iron	6,178	1,178	4,254	26,643	37,644	167
Juab	2,846	567	3,319	18,323	26,898	94
Kane	2,227	358	1,264	22,008	43,727	22
Millard	7,270	1,889	33,160	35,525	51,878	5,085
Morgan	2,898	377	2,582	5,964	7,401	385
Piute	838	146	309	6,528	8,932	6

County	PM ₁₀	PM ₂₅	NO _x	CO	VOC	SO _x
Rich	1,422	275	547	7,018	8,962	9
Salt Lake	31,874	6,747	31,941	145,225	35,626	4,208
San Juan	6,673	952	3,052	36,431	85,753	53
Sanpete	5,847	791	1,516	10,700	15,802	85
Sevier	6,757	916	2,092	12,780	18,106	91
Summit	7,736	1,145	4,466	15,066	18,904	215
Tooele	8,058	2,360	8,243	37,606	45,444	224
Uintah	9,547	1,420	12,348	26,282	109,809	228
Utah	12,551	3,045	14,613	63,421	30,939	426
Wasatch	3,689	597	1,448	8,705	12,590	16
Washington	11,644	1,697	6,026	39,318	44,443	92
Wayne	1,440	192	529	10,747	22,363	26
Weber	10,332	1,815	6,811	33,034	12,086	222
Statewide County Totals	193,380	36,892	207,979	787,115	931,690	28,358
Point Source Portables	86	38	394	163	39	60
Total	193,466	36,929	208,373	787,278	931,729	28,418

Source: Table 4 (UDAQ, 2014) Note: This report includes the following disclaimer "This report is intended to provide an overview of Utah's air quality. This report is published before end-of-year data can be audited and may be subject to change."

5.2.2.1 Proposed Action

Criteria Pollutants

The Skyline Mine is located in Emery County and the total emissions for Emery County include the emissions from the Skyline Mine. **Table 24** provides the Skyline Mine emission contribution to the cumulative total emissions.

Table 24. Skyline Mine Direct and Indirect Emissions as a Percentage of the Utah Cumulative Total Emissions

Pollutant	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs
Contribution to Cumulative Total	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%

Source: These percentages are calculated based on the total annual emissions shown in **Table 16** divided by the Total in **Table 23**.

The Skyline Mine direct and indirect emissions already exist and no changes to production are proposed. Cumulative impacts from Skyline Mine-related emissions and other regional emissions are included in the monitoring data described in Section 3.3.1.3.

Continued mining, operation of mine surface facilities, and associated vehicle traffic would contribute to the release of air pollution into the atmosphere at current levels. Increasing recreational use in the area will contribute additional emissions, but the level will increase gradually and is unknown. Emissions would remain local in impact and would not contribute cumulatively to larger scale particulate levels.

GHG and Climate Change

The GHG-related impacts on climate from an individual emissions unit cannot be accurately quantified. Possible GHG impacts have already been described in Section 3.3.1.3, and these impacts represent the possible cumulative impacts of all GHG emissions within the cumulative impacts analysis area.

The EPA estimated the 2013 CO₂ emissions in Utah were 66.4 million metric tons (Energy Information Administration, 2015c), although coal mined from Skyline may or may not be used in Utah. This same report estimated the U.S. emissions from fossil fuels in 2013 was 5,280 million metric tons, of which 1,524 million metric tons were from coal (Energy Information Administration, 2015b). CO₂ emissions include those from direct fuel use across all sectors, including residential, commercial, industrial, and transportation, as well as primary fuels consumed for electric generation. The Skyline Mine's direct and indirect contribution of 15,257 metric tons per year (0.015 million metric tons) of CO₂e will contribute 0.02 percent of the CO₂e emissions to the cumulative state-wide emission for CO₂e emissions and 0.0003 percent nationwide. It is estimated that the 47 million tons of coal mined at Flat Canyon would generate a total of approximately 89 million metric tons of CO₂. The maximum production Skyline Mine anticipates is 4.5 million tons per year, or 8.5 million metric tons of CO₂. Annual CO₂ emissions from burning Flat Canyon coal would be 0.16 percent of the total 2013 U.S. emissions and 12.8 percent of the total annual Utah emission. This impact is negligible and long-term.

Nationwide, the EPA inventory of GHG emissions (EPA, 2015c) provides an accounting of the activities that contribute cumulative impacts in the form of GHG emissions in the past (1990-2013). A considerable amount of information can be found in this report including trends, calculations of emissions from sectors, and constituents. This report identified nationwide recent trends *"In 2013, total U.S. greenhouse gas emissions were 6,673.0 MMT, or million metric tons, CO₂ Eq. Total U.S. emissions have increased by 5.9 percent from 1990 to 2013, and emissions increased from 2012 to 2013 by 2.0 percent (127.9 MMT CO₂ Eq.). The increase from 2012 to 2013 was due to an increase in the carbon intensity of fuels consumed to generate electricity due to an increase in coal consumption, with decreased natural gas consumption."*

Based on predictions that average annual temperatures in the southwestern US will increase by 3.5°F to 9.5°F by 2099 (maximum 0.11°F annually) (EPA, 2012a), during the 10-year additional life of the mine (through 2028), average annual temperatures might increase up to 1.5°F.

5.2.3 Social and Economic

The cumulative assessment area for impacts to social and economic resources includes Carbon, Emery, and Sanpete counties. The resource issues affected by the mining of the Flat Canyon Federal Coal Lease UTU-77114 includes employment to tax revenue. No reasonably foreseeable actions were identified that would have additional impacts on these issues; therefore there would be no cumulative impacts beyond those identified in the direct and indirect impacts.

Royalties paid to the federal government from coal mined from federal leases is distributed to the state where the coal was mined. The state distributes the revenue to the cities, towns, counties, and

other political subdivisions (school districts, special service districts, etc.). Utah received \$116.4 million in fiscal year 2015 from mineral royalties, including coal, oil, and gas lease royalties (ONRR, 2016). In Utah the distribution comes through the Permanent Community Impact Fund and the Utah Department of Transportation. In fiscal year 2015, the Permanent Community Impact Fund distributed \$156.6 million through grants and loan (Utah Department of Workforce Services, 2016). Mineral Lease Distributions for fiscal year 2015 through the Department of Transportation totaled \$53.3 million (Utah Department of Transportation, 2016). Carbon County received \$5.4 million, Emery County received \$2.1 million, and Sanpete County received \$7.840.

5.2.4 Greater Sage-Grouse

There would be no cumulative impact to greater sage-grouse because there would be no direct or indirect impacts to greater sage-grouse.

5.2.5 Water

The cumulative impacts analysis area for water is the Right Fork Huntington Creek subwatershed. None of the past and present mines shown on **Figure 11** are located in this subwatershed. This area is of sufficient size to account for the minor and self-healing impacts on water resource due to subsidence from mining the Flat Canyon Federal Coal Lease (see Section 4.2.1.1).

The Cumulative Hydrologic Impact Analysis completed by the DOGM found no evidence of material damage from the past mining operations, and no probability of material damage from actual or anticipated mining operations. The actual and proposed coal mining and reclamation operations have been designed to prevent material damage to the hydrologic balance outside the permit areas. (DOGM, 2013).

There would be no cumulative impacts on water in the Right Fork Huntington Creek subwatershed from other mines. Recreation and grazing have likely caused minor and localized, short-term impacts on water quality. Subsidence-related impacts have occurred within the subwatershed (see Section 5.2.1), but no impacts to surface or groundwater resources have been identified and therefore do not contribute cumulative impacts. Impacts from past mining have been mitigated in the Trough Springs Ridge area by infilling tension fractures with soil. Subsidence from known potential future mining is related to the Proposed Action and addressed in the direct and indirect (Galecki, 2016) impacts in Section 4.5.

5.2.6 Soils

The cumulative analysis area for soil-related impacts is the Project Area, plus areas of past subsidence, and existing soil stockpiles. Reasonably foreseeable actions identified include continued surface mining operations, recreation and grazing which could also increase soil erosion. This would occur both under the Proposed Action and the No Actions. There would be no additional cumulative impacts.

Chapter 6

Coordination and Consultation

6.1 Agencies and People Consulted

The following people or agencies were consulted prior to and during the preparation of this EA:

- U. S. Forest Service, Price Ranger District
- U. S. Forest Service, Ferron Ranger District
- Carbon County
- Sanpete County
- Eastern Shoshone Chairperson and Tribal Council
- Hopi Chairperson and Tribal Council
- Confederated Tribes of the Goshute Reservation Chairperson and Tribal Council
- Ute Chairperson and Tribal Council
- Ute Mountain Chairperson and Tribal Council
- Pueblo of Zia Governor and Tribal Council
- Navajo President and Tribal Council
- Northwestern Band of the Shoshone Nation Chairperson and Tribal Council
- Paiute Tribe of Utah Chairperson and Tribal Council
- Pueblo of Jemez Governor and Tribal Council
- Pueblo of Laguna Governor and Tribal Council
- Pueblo of Santa Clara Governor and Tribal Council
- Pueblo of Zuni Governor and Tribal Council
- Shoshone-Bannock Tribes of Fort Hall Chairperson and Tribal Council
- Southern Ute Chairperson and Tribal Council
- Affected Landowners
- Sierra Club
- WildEarth Guardians

6.1.1 Public Comment Process

Public comments were solicited through public outreach legal notices published in the *Emery County Progress* and *Sun Advocate* newspapers on October 13 and 27, 2015, and the *Sanpete Messenger* on October 25 and 29, 2015. Additionally, a public outreach letter was mailed to 62

identified interested parties including Native American Tribes, state agencies, city and county governments, adjacent landowners, and other interested parties. Four letters were received, along with a mass mailing of approximately 273 emails largely stating opposition to the project.

6.1.2 Tribal Consultation

Letters describing the proposed Project were sent to the Eastern Shoshone Chairperson and Tribal Council, the Hopi Chairperson and Tribal Council, the Confederated Tribes of the Goshute Reservation Chairperson and Tribal Council, the Ute Chairperson and Tribal Council, the Ute Mountain Chairperson and Tribal Council, the Pueblo of Zia Governor and Tribal Council, the Navajo President and Tribal Council, the Northwestern Band of the Shoshone Nation Chairperson and Tribal Council, the Paiute Tribe of Utah Chairperson and Tribal Council, the Pueblo of Jemez Governor and Tribal Council, the Pueblo of Laguna Governor and Tribal Council, the Pueblo of Santa Clara Governor and Tribal Council, the Pueblo of Zuni Governor and Tribal Council, the Shoshone-Bannock Tribes of Fort Hall Chairperson and Tribal Council, and the Southern Ute Chairperson and Tribal Council on November 3 and 5, 2015.

The Hopi, Southern Ute, and Santa Clara Pueblo have corresponded with OSMRE and further discussions are ongoing.

6.2 Preparers and Participants

Table 25 shows a list of the preparers of this EA and those who participated in the preparation of this EA from OSMRE.

Table 25. List of Preparers

Organization	Name	Title/ Project Responsibility
OSMRE	Marcelo Calle	Manager, Field Operations Branch
OSMRE	Nicole Caveny	Environmental Protection Specialist/Project Manager
BLM	Roger Bankert	Minerals Support Supervisor
BLM	Jefferson McKenzie	Mining Engineer
BLM	Leonard Herr	Air Quality Physical Scientist
BLM	Steve Rigby	Assistant Field Manager, Coal
Forest Service	Kyle Beagley	
Forest Service	Debra Miller	Assistant Regional Air Program Manager
Forest Service	Jeffrey Salow	Geologist
Utah DOGM	Steve Christensen	Utah Division of Oil & Gas, Hydrologist
Utah DOGM	Amanda Daniels	Utah Division of Oil & Gas, Hydrologist
Utah DOGM	Dana Dean	Utah Division of Oil & Gas, Associate Director of Mining
Utah DOGM	Daron Haddock	Utah Division of Oil & Gas, Environmental Manager

Table 26 shows a list of the preparers of this EA and those who participated in the preparation of this EA from the third party consultants Tetra Tech, Inc.

Table 26. Contractors

Organization	Name	Title/ Project Responsibility
Tetra Tech, Inc.	Cameo Flood	Project Manager
Tetra Tech, Inc.	Mark Asioan	Air Quality
Tetra Tech, Inc.	Lynn Peterson	GIS, Cultural, and Editor
Tetra Tech, Inc.	Tim Reeves	Water
Tetra Tech, Inc.	Wendy Rieth	Wildlife Biologist Sage-Grouse
Tetra Tech, Inc.	Stephen Tartaglia	Air Quality
Tetra Tech, Inc.	Michele Weidner	Reviewer
Tetra Tech, Inc.	Shane Matolyak	Environmental Scientist

Chapter 7

References

- Arabasz, W. J., Nava, S. J. & Phelps, W. T., 1997. Mining seismicity in the Wasatch Plateau and Book Cliffs Coal Mining Districts, Utah. USA. Overview and update. 4th International Symposium on Rockbursts and Seismicity in mines. Krakow, Poland. August.
- BLM, 2002. Record of Decision. Federal Lease Sale Offering: "Flat Canyon Coal Tract" (UTU-77114). April 11, Salt Lake City: BLM Utah State Office.
- BLM, 2008. Proposed Resource Management Plan and Final Environmental Impact Statement. Chapter 3. Price Field Office. August. Available online http://www.blm.gov/style/medialib/blm/ut/price_fo/Planning/PRMP/PRMPVol1.Par.99461.File.dat/Vol_1_03_Chapter3.pdf.
- BLM, 2015a. Determination of NEPA Adequacy DOI-BLM-UT-FPO-UTU-77114. Flat Canyon LBA. February, s.l.: Price Field Office.
- BLM, 2015a. United States Department of the Interior Bureau of Land Management Coal Lease UTU-77114. OMB No 1004-0073. July 1.
- BLM, 2015b. Successful Competitive Lease Sales Since 1990, Utah. US Department of the Interior. [Online]
Available at: <http://www.blm.gov/ut/st/en/prog/energy/coal/coaltables.html>
- BLM, 2015c. Utah Greater Sage-Grouse Approved Resource Management Plan Amendment. Attachment 4 from the USDI 2015 Record of Decision and Approved Resource Management Plan Amendments for the Great Basin Region including the Greater Sage-Grouse Sub-Regions of: Idaho.
- BLM, 2015d. Coal Lease. UTU 77114. United States Department of the Interior, Bureau of Land Management.
- Cai, H. & Wang, M. Q., 2014. Estimation of Emission Factors of Particulate Black Carbon and Organic Carbon from Stationary, Mobile, and Non-point Sources in the United States for Incorporation into GREET. ANL/ESD-14/6, Argonne, IL: Argonne National Laboratory.
- Canyon Fuel Company, LLC, 2002. Mine and Reclamation Plan, Helper, Utah: Canyon Fuel Company.
- Canyon Fuel Company, LLC, 2015. Pre-Subsidence Survey Map. Skyline Mines. Drawing No. 4.17.3-1A. Revision 9. September 25.
- CEQ, 2014. Revised Draft Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and Effects of Climate Change in NEPA Reviews. CFR Part IV Federal Register, Volume 70, Number 247, Wednesday, December 24.

- DEQ, DAQ, 2015. Approval order: Modification to approval order dAQE-AN0092007-03 to increase haulage of coal and add staking tube. Approval order number DAQE-AN1000*20001-15. July 13.
- DNR, 2015. Utah Coal Program. Utah Department of Natural Resources. Available online www.ogm.utah.gov/coal.
- DOGM, 2013. Mud Creek Basin and Upper Huntington Creek Basin Cumulative Hydrologic Impact Assessment (CHIA) for the Skyline Mine C/007/0005, White Oak Mine C/007/0001, Blazon Mine For/007/0021, Kinney #2 Mine C/007/0047. October 7, s.l.: Available online https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiQzIvw_eHMAhWCbSYKHZnrAjqQFggcMAA&url=https%3A%2F%2Ffs.ogm.utah.gov%2Fpub%2FMINES%2FCoal%2F007%2FC0070005%2FCHIAInfo%2F2282006%2FCHIA2282006.doc&usg.
- DWQ, 2015. Authorization to discharge under the Utah Pollutant discharge elimination system Permit No. UT0023540 Major Industrial. Online <http://www.deq.utah.gov/Permits/water/updes/docs/2010/07Jul/CANYONFUELCO%20LLCSKYLINEUT0023540.pdf>. April 28, SLC: State of Utah.
- Energy Information Administration, 2015a. Rankings: total Carbon Dioxide Emissions, 2013. Available online <http://www.eia.gov/state/rankings/?sid=UT#series/226>, Washington DC: US Department of Energy.
- Energy Information Administration, 2015b. Short-term energy outlook. Renewables and CO2 Emissions. Available online http://www.eia.gov/forecasts/steo/report/renew_co2.cfm?src=Environment-b1, Washington DC: US Department of Energy.
- Energy Information Administration, 2015c. Table 1.State energy-related carbon dioxide emissions per tye (2000-2013). October. Available online <http://www.eia.gov/environment/emissions/state/analysis/pdf/table1.pdf>, Washington, DC: US Department of Energy.
- Energy Information Administration, 2016a. BETA. Coal Data Browser. Skyline Mine #3 2014. Available online: <https://www.eia.gov/beta/coal/data/browser/#/shipments/mine/4201566>, Washington DC: US Department of Energy.
- Energy Information Administration, 2016b. BETA Coal Data Browser. Skyline Mine #3 production. Available online <http://www.eia.gov/beta/coal/data/browser/#/mine/4201566?freq=A&start=2001&end=2014&ctype=linechart<ype=pin&pin=&matype=0&linechart=COAL.MINE.PRODUCTION.4201566-BIT-UND>, Washington, DC: US Department of Energy.
- Energy Information Administration, 2016c. Total Energy. Monthly review. Available online <http://www.eia.gov/beta/MER/index.cfm?tbl=T02.01#/?f=A&start=200001>. Accessed May 22., Washington DC: US Department of Energy.

- Energy Information Administration, 2016d. What is U.S. electricity generation by energy sources? Updated April 1, 2016. Available online <http://www.eia.gov/tools/faqs/faq.cfm?id=427&t=3>, Washington DC: US Department of Energy.
- EPA, 2011. Power plants likely covered by the toxics rule. Available online <https://www3.epa.gov/mats/pdfs/20111221PowerPlantsLikelyCoveredbyMATS.pdf>.
- EPA, 2012a. Climate Change, Impacts & Adaptation. Southwest Impacts and Adaptation., Accessed on March 16, 2016.: Available at <https://www3.epa.gov/climatechange/impacts/southwest.html>.
- EPA, 2014. AQI Air Quality Index. A guide to air quality and your health. Available online http://www3.epa.gov/airnow/aqi_brochure_02_14.pdf. February.
- EPA, 2015a. Clean Power Plan: State at a Glance. Available online <http://www3.epa.gov/airquality/cpptoolbox/utah.pdf>.
- EPA, 2015b. Steam Electric Power Generating Effluent Guidelines - 2015 Final Rule. [Online] Available at: <https://www.epa.gov/eg/steam-electric-power-generating-effluent-guidelines-2015-final-rule#documents> [Accessed March 2016].
- EPA, 2015c. Inventory of U.S. Greenhouse Gas Emissions and Sinks. 1990 - 2013. April 15, 2015. Available online <https://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf>.
- EPA, 2016a. National Ambient Air Quality Standards (NAAQS). Available online <http://www3.epa.gov/ttn/naaqs/criteria.html>.
- EPA, 2016b. Initial list of hazardous air pollutants with modifications. Available Online <http://www.epa.gov/ttnatw01/188polls.html>.
- EPA, 2016d. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014. EPA 430-R-16-002. April 15. Available online <https://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2016-Main-Text.pdf>.
- EPA, 2016e. Black Carbon. Basic Information. February 23. Available online <https://www3.epa.gov/blackcarbon/basic.html>.
- EPA, 2016f. Understanding global warming potentials. February 23. Available online <https://www3.epa.gov/climatechange/ghgemissions/gwps.html>.
- EPA, 2016g. The Social Cost of Carbon, Viewed March 2, 2016: Available at <http://www3.epa.gov/climatechange/EPAactivities/economics/scc.html>.
- Galecki, G., 2016. Personal communication with Lynn Peterson concerning other mines in project vicinity, Jan. 15..
- Galecki, G., 2015a. Personal communication with Cameo Flood concerning information on customers and contracts. Environmental Engineer, Nov. 25th.

- Galecki, G., 2015b. Personal communication with Cameo Flood stating the current Skyline Mine employment is 320. Gregg Galecki. Environmental Engineer. November 20.
- HDR Engineering, Inc., 2015. NOI to Construct. Canyon Fuel Company LLC Skyline Mines. January 19.
- Irwin, B. B. a. M., 2007. Basic Mercury Data & Coal Fired Power Plants. [Online] Available at: <https://www.purdue.edu/discoverypark/energy/assets/pdfs/cctr/outreach/Basics2-Mercury-Mar07.pdf> [Accessed March 2016].
- Jarrett, C., 2015. Sanpete County Commission scoping comment letter. Claudia Jarrett (Chair). November 9, Manti, Utah.
- NRCS, 2014. Email correspondence from Joseph Dyer, Area Resource Soil Scientist. Natural Resources Conservation Service, US Department of Agriculture. June 19. Price Utah.
- NRCS, 2016. Web Soil Survey. Natural Resources Conservation Service. <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>.
- ONRR, 2016. Office of Natural Resources Revenue. Statistical Information. Disbursements. FY2105 by state..
- OSMRE, 1989. Handbook on Prodedures for Implementing the National Enviornmental Policy Act. US Department of the Interior. Available online <http://www.google.com/ur> . March.
- Petersen Hydrologic, LLC, 2014a. Investigation of Groundwater and Surface-Water Systems in the Flat Canyon Tract and Adjacent Area; Probably Hydrologic Consequences of Coal Mining in the Flat Canyon Tract, Sanpete County, Utah. August 13, Lehi, Utah: Peterson Hydrologic, LLC Consultants in Hydrogeology.
- Petersen Hydrologic, LLC, 2014b. Groundwater Conditions in the Star Point Sandstone in the Vicinity of the Skyline Mine, 2014. August 18.
- Skyline Mine, 2015. 40 CFR Par FF Methane Emissions Calculations. Adit, Fan, Sharts. .
- The Hopi Tribe, 2001. Letter to Elaine Zieroth, Forest Supervisor, Manti-La Sal National Forest. November 12.
- UAC, 2016. Utah Administrative Code R307-405-4. Available online <http://www.rules.utah.gov/publicat/code/r307/r307-405.htm#T4>.
- UDAQ, 2014. 2014 Annual Report. Utah Division of Air Quality. Available online http://www.airquality.utah.gov/docs/2015/02Feb/2014DAQAnnualReport_FINAL.pdf.
- UDAQ, 2015a. Utah Air Quality Monitoring Network, Five-year Network Assessment. Utah Division of Air Quality, Air Monitoring Section. June. Available online <http://www.airmonitoring.utah.gov/network/docs/2015/05May/2015FiveYearReport.pdf>.

- UDAQ, 2015b. Approval order: Modification to approval order dAQE-AN0092007-03 to increase haulage of coal and add staking tube. Approval order number DAQE-AN1000*20001-15. Utah Division of Air Quality. July 13.
- UDAQ, 2016. Large Industrial, Oil and Gas Compressor and Gas Plant Emitters (2012 data). Available online <http://enviro.deq.utah.gov/>.
- UDEQ, 2015. Permit No. UT0023510. Major Industrial. Authorization to Discharge under the Utah Pollutant Discharge Elimination System. Available online at <http://www.deq.utah.gov/Permits/water/updes/docs/2010/07Jul/CANYONFUELCO%20LLCSKYLINEUT0023540.pdf>.
- UDWR, 2014. SGMAs2014. Utah Division of Wildlife Resources. GIS data for Sage-Grouse Management Areas (SGMAs), September 15.
- US Census Bureau, 2014. Census Bureau, American Community Survey Office, Washington, D.C..
- US Department of Commerce, 2014a. Bureau of Economic Analysis, Regional Economic Accounts. Table CA30, Washington, DC.
- US Department of Commerce, 2014b. Bureau of Economic Analysis, Regional Economic Accounts. Table CA05, Washington, DC.
- US Forest Service, 2002a. Flat Canyon Coal Lease Tract Final Environmental Impact Statement. Intermountain Region. January.
- US Forest Service, 2002b. Record of Decision based on the Final Environmental Impact Statement for the Flat Canyon Coal Lease Tract (UTU-77114). January, Price, UT: Manti-La Sal National Forest.
- US Forest Service, 2013. Supplemental Information Report: Flat Canyon Coal Least Tract FEIS. February 1.
- US Forest Service, 2015. Greater Sage-grouse Record of Decision. Idaho and Southwest Montana, Nevada, Utah. Available online <http://www.fs.fed.us/sites/default/files/great-basinROD-package.pdf>.
- USFWS, 2010. Endangered and Threatened Wildlife and Plants; 12-Month Findings for Petitions to List the Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or Endangered. Federal Register Vol. 75, No. 55: 13910 – 14014. March 23.
- Utah Department of Natural Resources, 2016. Utah Oil and Gas. [Online] Available at: <http://oilgas.ogm.utah.gov/Statistics/Statistics.cfm> [Accessed 26 April 2016].
- Utah Department of Transportation, 2016. Fiscal Year 2015 Mineral Lease Distribution. Available online <http://www.udot.utah.gov/main/uconowner.gf?n=16029631452820105..>
- Utah Department of Workforce Services, 2016. Permanent Community Impact Fund Board. Available online <http://jobs.utah.gov/housing/cib/index.html>.

Utah SHPO, 2001. State of Utah. Utah State Historical Society. Letter regarding Flat Canyon Federal Coal Lease Tract. Case No. 01-1540. September 27.

Appendix A
Outreach Letter and Legal Notice



United States Department of the Interior

OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT

Western Region Office
1999 Broadway, Suite 3320
Denver, CO 80202-3050



October 9, 2015

Dear Interested Public Land User,

The U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region, will prepare an environmental assessment (EA) for the mining plan modification for the Canyon Fuel Company, LLC's (Canyon Fuel) Skyline Mine (the Project). Skyline Mine is located approximately five miles southwest of Scofield, in Carbon County, Utah. To comply with the Mineral Leasing Act 1920 (MLA), the DOI Assistant Secretary for Land and Minerals Management (ASLM) must approve the Project before any mining and reclamation can occur on lands containing leased Federal coal.

Skyline Mine is an underground operation proposing to modify their Surface Mining Control and Reclamation Act of 1977 Permit Area to include approximately 2,692 acres of federal coal within the Flat Canyon Coal Lease Tract (UTU77114) and to access approximately 1,100 acres of private coal reserves. Coal occurs in two seams throughout the project area and the majority of these seams could be mined, using longwall mining technology, to produce approximately 36 million tons of coal and extend the life of the Skyline Mine by 9 to 12 years. UTU77114 was issued by the Bureau of Land Management, and by consent of the Manti-La Sal National Forest, on September 11, 2015.

OSMRE is preparing this EA to evaluate the environmental impacts resulting from the Project, pursuant to the requirements of the National Environmental Policy Act of 1969. The EA will disclose the potential for direct, indirect, and cumulative impacts to the environment from the Project. Further, this EA will update, clarify, and provide new and additional environmental information for the Project. As a result of the EA process, OSMRE will determine whether or not there are significant environmental impacts. An environmental impact statement will be prepared if the EA identifies significant impacts. If a finding of no significant impact is reached, and pursuant to 30 CFR 746.13, OSMRE will prepare and submit to the ASLM a mining plan decision document recommending approval, disapproval, or conditional approval of the mining plan. The ASLM will approve, disapprove, or conditionally approve the mining plan approval document within the mining plan decision document. OSMRE is soliciting public comments. Your comments will help to determine the issues and alternatives that will be evaluated in the EA. You are invited to direct these comments to:

OSMRE WR
C/O: Nicole Caveny
Skyline Mine EA
1999 Broadway, Suite 3320
Denver, CO 80202-3050

Comments may also be emailed to: OSM-NEPA-UT@OSMRE.gov, ensure the subject line reads: ATTN: OSMRE, Skyline Mine, Flat Canyon MPDD EA. Comments should be received or postmarked no later than November 9, 2015 in order to be considered during the preparation of the EA. Comments received, including names and addresses of those who comment, will be considered part of the public record for this project and will be available for public inspection. Additional information regarding the Project may be obtained from Nicole Caveny, telephone number (303) 293-5078. When available, the EA and other supporting documentation will be posted at and may be obtained from <http://www.wrcc.osmre.gov/initiatives/skylinemine.shtm>.

Sincerely,

A handwritten signature in black ink that reads "Marcelo Calle". The signature is written in a cursive style with a large initial "M".

Marcelo Calle, Manager
Field Operations Branch

Legal notice published in the Sun Advocate and Emery County Progress on October 13 and October 27, 2015, and the Sanpete Messenger on October 15 and October 29, 2015.

PUBLIC NOTICE
SKYLINE MINE MINING PLAN MODIFICATION
ENVIRONMENTAL ASSESSMENT

The US Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region, will prepare an environmental assessment (EA) for the mining plan modification for the Canyon Fuel Company, LLC's Skyline Mine (the Project). Skyline Mine is located approximately five miles southwest of Scofield, in Carbon County, Utah. To comply with the Mineral Leasing Act of 1920, the DOI Assistant Secretary for Land and Minerals Management (ASLM) must approve the Project before any mining and reclamation can occur on lands containing leased Federal coal.

Skyline Mine is an underground operation proposing to modify their Surface Mining Control and Reclamation Act of 1977 Permit Area to include approximately 2,692 acres of federal coal within the Flat Canyon Coal Lease Tract (UTU77114) and to access approximately 1,100 acres of private coal reserves. Coal occurs in two seams throughout the project area and the majority of these seams could be mined, using longwall mining technology, to produce approximately 36 million tons of coal and extend the life of the Skyline Mine by 9 to 12 years. UTU77114 was issued by the Bureau of Land Management, and by consent of the Manti-La Sal National Forest, on September 11, 2015.

OSMRE is preparing this EA to evaluate the environmental impacts resulting from the Project, pursuant to the requirements of the National Environmental Policy Act of 1969. The EA will disclose the potential for direct, indirect, and cumulative impacts to the environment from the Project. Further, this EA will update, clarify, and provide new and additional environmental information for the Project. As a result of the EA process, OSMRE will determine whether or not there are significant environmental impacts. An environmental impact statement will be prepared if the EA identifies significant impacts. If a finding of no significant impact is reached, and pursuant to 30 CFR 746.13, OSMRE will prepare and submit to the ASLM a mining plan decision document recommending approval, disapproval, or conditional approval of the mining plan. The ASLM will approve, disapprove, or conditionally approve the mining plan approval document within the mining plan decision document.

OSMRE is soliciting public comments on the Project. Your comments will help to determine the issues and alternatives that will be evaluated in the environmental analysis. You are invited to direct these comments by email: osm-nepa-ut@osmre.gov, ensure the subject line reads: ATTN: OSMRE, Skyline Mine, Flat Canyon MPDD EA. Comment may also be received by mail: OSMRE WR, C/O Nicole Caveny, Skyline Mine, Flat Canyon MPDD EA, 1999 Broadway, Suite 3320, Denver, CO 80202 and be postmarked no later than November 9, 2015, in order to be considered during the preparation of the EA. Comments received, including names and addresses of those who comment, will be considered part of the public record for this Project and will be available for public inspection. Additional information regarding the Project may be obtained from Nicole Caveny, telephone number (303) 293-5078. When available, the EA and other supporting documentation will be posted at and may be obtained from <http://www.wrcc.osmre.gov/initiatives/skylinemine.shtm>.

Appendix B
Water Monitoring Results

Average Discharge Rates and Solute Geochemical Compositions for Springs and Streams**Springs****Price River springs**

Site	Temp °C	pH	Cond. µS/cm	Flow gpm	TDS mg/L	Ca	Mg	Na	K	HCO ₃	CO ₃	SO ₄	C
29-138	5.6	7.26	439	24.1	272	83	8.0	2.2	0.0	300	0.0	4.0	3
32-277	6.1	7.33	257	1.8	170	41	6.8	1.2	0.2	163	0.0	7.8	0.8
MSS-1	4.9	7.71	374	1.05	228	62	8.5	1.0	0.0	240	0.0	10.0	1.0
Ave.	5.5	7.4	357	9.0	223	61.8	7.8	1.5	0.1	234	0.0	7.3	1.6

Price River/Castlegate contact springs

Site	Temp °C	pH	Cond. µS/cm	Flow gpm	TDS mg/L	Ca	Mg	Na	K	HCO ₃	CO ₃	SO ₄	
29-133	4.0	7.33	324	35.5	193	60	4.8	1.7	0.0	211	0.0	5.3	1.2
Ave.	4.0	7.3	324	35.5	193	60	5	1.7	0.0	211	0.0	5.3	1.2

Castlegate Sandstone springs

Site	Temp °C	pH	Cond. µS/cm	Flow gpm	TDS mg/L	Ca	Mg	Na	K	HCO ₃	CO ₃	SO ₄	
33-268	4.4	7.25	89	1.8	72	14	2.0	1.5	0.0	46	0.0	7.0	2.0
4-429	6.8	7.39	139	1.7	87	22	4.0	1.0	0.0	85	0.0	2.0	0.7
8-253	3.6	7.13	136	16.0	86	23	2.5	1.2	0.0	91	0.0	5.0	0.3
Ave.	4.9	7.3	122	6.5	81	19.7	2.8	1.2	0.0	73.9	0.0	4.7	1.0

Castlegate/Blackhawk contact springs

Site	Temp °C	pH	Cond. µS/cm	Flow gpm	TDS mg/L	Ca	Mg	Na	K	HCO ₃	CO ₃	SO ₄	C
21-222	4.8	7.37	322	7.7	190	49	11.2	1.3	0.0	202	0.0	6.5	0.7
32-183	3.3	7.23	169	7.7	122	28	5.2	1.5	0.0	117	0.0	5.2	0.7
32-279	5.5	7.35	321	2.7	225	54	15.0	1.7	0.0	240	0.0	8.5	0.8
Ave.	4.5	7.3	271	6.0	179	43.7	10.4	1.5	0.0	186	0.0	6.7	0.7

Blackhawk Formation springs

Site	Temp °C	pH	Cond. µS/cm	Flow gpm	TDS mg/L	Ca	Mg	Na	K	HCO ₃	CO ₃	SO ₄	C
28-110	6.0	7.51	340	2.0	208	56	9.8	2.0	0.0	225	0.0	7.0	1.5
3-290	7.0	8.00	219	14.9	158	39	6.3	2.6	0.43	155	0.07	5.3	2.0
4-173	4.7	7.45	233	1.1	185	48	9.2	1.8	0.0	195	0.0	5.2	1.5
5-231	2.9	7.15	206	3.2	138	37	4.3	1.8	0.0	141	0.0	7.3	0.8
Ave.	5.1	7.5	249	5.3	172	45.1	7.4	2.1	0.1	179	0.0	6.2	1.5

Groundwater storage tanks

Site	Temp °C	pH	Cond. µS/cm	Flow gpm	TDS mg/L	Ca	Mg	Na	K	HCO ₃	CO ₃	SO ₄	C
MST-1	9.6	7.80	369	---	200	62	8.0	1.0	0.0	237	0.0	0.0	1.0
MST-2	8.0	8.20	195	---	140	30	2.0	2.0	0.0	112	0.0	0.0	2.0
MST-3	11.9	7.85	353	8.3	236	58	16.5	1.0	0.0	264	0.0	5.5	1.0

Creeks

Site	Temp °C	pH	Cond. µS/cm	Flow gpm	TDS mg/L	Ca	Mg	Na	K	HCO ₃	CO ₃	SO ₄	C
C-5	7.5	7.85	192	28	141	36	5.8	2.3	0.0	148	0.0	4.3	1.2
C-6	8.9	8.46	235	240	137	37	6.0	3.0	0.0	132	6.5	5.5	3.5
C-7	9.4	8.45	261	1,200	139	38	7.0	2.0	0.0	161	2.5	4.0	1.0

Site	Temp °C	pH	Cond. µS/cm	Flow gpm	TDS mg/L	Ca	Mg	Na	K	HCO ₃	CO ₃	SO ₄	C
C-8	8.1	8.47	267	1,275	150	42	6.5	2.0	0.0	163	3.0	4.5	1.5
CS-10	7.9	7.72	241	984	143	39	4.9	2.9	0.4	131	0.6	17.9	3.0
CS-16	8.0	8.39	296	515	183	53	7.4	1.8	0.4	193	1.8	7.8	1.1
CS-17	7.8	8.37	278	187	173	48	6.8	1.8	0.4	171	1.2	8.3	1.6
CS-18	10.1	8.47	270	2,067	150	42	7.0	3.5	0.3	156	1.2	7.3	5.5
UPL-10	9.7	8.07	313	3,120	198	53	8.7	5.7	0.7	177	1.9	13.4	11.7

Source. Table 3 (Petersen Hydrologic, LLC, 2014a)