

Bagdad Mine Stockpile Extension Environmental Assessment

DOI-BLM-AZ-C010-2014-0014-EA

Volume 1 Chapters 1 through 5

**Bureau of Land Management
Kingman Field Office
2755 Mission Boulevard
Kingman, Arizona 86401**

August 2016



BAGDAD MINE STOCKPILE EXTENSION PROJECT ENVIRONMENTAL ASSESSMENT

Prepared for

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SWCA Project No. 26137

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BUREAU OF LAND MANAGEMENT

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August 2016

In Reply Refer To:
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AZA 5961
AZA 28639

Dear Reader:

Attached for your review is the *Bagdad Mine Stockpile Extension Environmental Assessment (EA)* DOI-BLM-AZ-C010-2014-0014-EA and an unsigned Finding of No Significant Impact (FONSI) prepared by the Bureau of Land Management (BLM) Kingman Field Office. The BLM prepared these documents in collaboration with two state agencies (the Arizona Game and Fish Department and the Arizona State Land Department) and one municipal government (Mohave County) in an effort to provide an objective analysis of the proposed actions based on the best available science. The project area is located in west-central Yavapai County, immediately west of the unincorporated community of Bagdad, Arizona.

These documents have been developed by the BLM in accordance with the National Environmental Policy Act of 1969 (NEPA) and Council on Environmental Quality (CEQ) regulations contained in Title 40 of the Code of Federal Regulations (CFR) Part 1500 *et seq.*, the regulations for implementing the provisions of NEPA.

The EA analyzes the potential environmental effects of two separate and independent proposed actions: a Freeport-McMoRan Bagdad Inc. (FMBI) request to authorize extension of the existing waste rock stockpile located south of the open pit at the Bagdad Mine, as well as authorization for installation of two groundwater monitoring wells and associated access roads south of the proposed stockpile extension, and an Arizona Public Service (APS) request for an amendment to their existing right-of-way (ROW) for power line maintenance access roads within the same general project area. Though unrelated to one another, NEPA regulations allow evaluation of these two actions in a single document because they would occur in approximately the same geographic area and within the same general time frame (40 CFR 1508.25(a)(3)).

In conjunction with the EA, the BLM is issuing a draft FONSI statement for public review. This statement describes the overall scope of analysis in the EA, identifies those resources that were analyzed in detail, and documents the BLM's conclusion that no environmental effects are likely to occur as a result of the proposed actions that would meet the definition of significance as described in 40 CFR 1508.27, and therefore an Environmental Impact Statement is not necessary.

Electronic copies of the EA and Draft FONSI can be viewed and downloaded from the project website: <http://bit.ly/BagdadMPO>. Hard copies of the documents are also available for review at

the BLM Kingman Field Office, 2755 Mission Boulevard, Kingman, Arizona, and at the Wikieup Post Office, 18170 U.S. Highway 93, Wikieup, Arizona.

The EA and the unsigned FONSI will remain available for public review and comment for a period of 30 calendar days (i.e., until **October 6, 2016**). The BLM welcomes public comment on these documents. Comments can be submitted via U.S. mail to:

Bureau of Land Management
Kingman Field Office
Attn: Bagdad Environmental Assessment
2755 Mission Boulevard
Kingman, AZ 86401

Comments may also be submitted via email to: blm_az_kfo_bagdad_mine@blm.gov or via fax to 928-718-3761.

Following the conclusion of this 30-day review period, **October 6, 2016**, the BLM will issue a statement of any corrections or amendments that are being made to the EA as a result of the comments received and will, if it is determined no further NEPA analysis or other agency actions are warranted, issue a final, signed FONSI for the project. At a later date two separate decisions will be issued, one for the FMBI proposed action and one for the APS proposed action. These decision documents will be publicly announced and copies posted to the project website, <http://bit.ly/BagdadMPO>.

If you have questions, please contact Geologist Walter (Buzz) Todd III at 928-718-3717 or by email at wtodd@blm.gov.

Sincerely,



Amanda M. Dodson
Field Manager

TABLE OF CONTENTS

Acronyms and Abbreviations	vii
1. PURPOSE OF AND NEED FOR ACTION	1
1.1 INTRODUCTION	1
1.2 PROJECT HISTORY AND BACKGROUND	1
1.2.1 Bagdad Mine.....	1
1.2.2 Current Permits and Approvals for Bagdad Mine Operations.....	3
1.2.3 Current Approvals of the APS Power Line ROW	4
1.3 PURPOSE OF AND NEED FOR ACTION	5
1.4 DECISIONS TO BE MADE	5
1.5 RESOURCE MANAGEMENT PLAN CONFORMANCE	5
1.6 APPLICABLE LAWS, STATUTES, AND REGULATIONS	6
1.6.1. General Mining Law of 1872 and BLM Oversight.....	6
1.6.2. FLPMA and BLM Rights-of-Way.....	7
1.7 PUBLIC SCOPING.....	7
1.7.1. Issues Identified During Scoping.....	9
1.7.2. Issues Eliminated from Detailed Analysis.....	10
2. PROPOSED ACTIONS AND ALTERNATIVES	19
2.1 INTRODUCTION	19
2.2 PROPOSED ACTIONS	19
2.2.1 Proposed Stockpile Extension.....	19
Applicant-Committed Environmental Protection Measures.....	20
2.2.2 Proposed Power Line Access Roads.....	23
Applicant-Committed Environmental Protection Measures.....	24
2.3 NO ACTION ALTERNATIVES	24
2.3.1 FMBI Stockpile Extension.....	24
2.3.2 APS Access Roads.....	25
2.4 PROPOSED ACTIONS CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS	25
2.4.1 Alternate Stockpile Extension Locations.....	25
2.4.2 Additional APS Access Roads.....	25
3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	27
3.1 INTRODUCTION	27
3.1.1 Supplemental Authorities	27
3.1.2 Additional Resources Considered for Analysis	29
3.2 METHODOLOGY	30
3.3 CUMULATIVE IMPACTS ANALYSIS.....	31
3.3.1 Cumulative Impacts Analysis Area	31
3.4 AIR RESOURCES	32
3.4.1 Resource Issues and Indicators for Analysis	32
3.4.2 Affected Environment.....	32
Air Quality.....	32

Climate Change	34
3.4.3 Environmental Consequences	35
Proposed Bagdad Mine Stockpile Extension	35
Proposed 115-kV Power Line Access Roads	36
Mitigation Measures	37
Cumulative Impacts	38
3.5 WATER RESOURCES	39
3.5.1 Resource Issues and Indicators for Analysis	39
3.5.2 Affected Environment	39
Surface water	39
Groundwater	43
3.5.3 Environmental Consequences	47
Surface Water	47
Groundwater	49
3.6 GEOLOGY AND SOIL RESOURCES	50
3.6.1 Resource Issues and Indicators for Analysis	50
3.6.2 Affected Environment	50
Geology	50
Soils	53
3.6.3 Environmental Consequences	54
Proposed Bagdad Mine Stockpile Extension	54
Proposed 115-kV Power Line Access Roads	55
Mitigation Measures	55
Cumulative Impacts	55
3.7 VEGETATION RESOURCES	56
3.7.1 Resource Issues and Indicators for Analysis	56
3.7.2 Affected Environment	56
Analysis Area	56
Vegetation Communities	59
Arizona Native Plant Law	60
Noxious and Invasive Weed Species	60
Special Status Plant Species	61
3.7.3 Environmental Consequences	61
Vegetation Communities	61
Arizona Native Plant Law	62
Noxious and Invasive Weed Species	62
Special Status Plant Species	62
Mitigation Measures	62
Cumulative Impacts	64
3.8 WILDLIFE RESOURCES	64
3.8.1 Resource Issues and Indicators for Analysis	64
3.8.2 Affected Environment	64
Analysis Area	64
General Wildlife	65
Game Species	65
Special Status Wildlife Species	65
BLM Sensitive Species	66
AGFD Species of Greatest Conservation Need	66
Migratory Bird Treaty Act	69
Bald and Golden Eagle Protection Act	69

Wildlife Connectivity/Wildlife Movement Corridors 69

3.8.3 Environmental Consequences 69

 Impacts Common to All 69

 Mitigation Measures 70

 Wildlife Connectivity/Wildlife Movement Corridors 71

 Cumulative Impacts 71

3.9 CULTURAL RESOURCES 71

 3.9.1 Resource Issues and Indicators for Analysis 72

 3.9.2 Affected Environment 72

 Archaeological Sites 72

 Native American Concerns 73

 3.9.3 Environmental Consequences 73

 Proposed Bagdad Mine Stockpile Extension 73

 Proposed 115-kV Power Line Access Roads 73

 Mitigation Measures 74

 Cumulative Impacts 74

3.10 RECREATION RESOURCES / PUBLIC ACCESS 74

 3.10.1 Resource Issues and Indicators for Analysis 74

 3.10.2 Affected Environment 75

 Recreation Resources 75

 Hunting 76

 Public Access 76

 3.10.3 Environmental Consequences 78

 Proposed Bagdad Mine Stockpile Extension 78

 Proposed 115-kV Power Line Access Roads 78

 Mitigation Measures 79

 Cumulative Impacts 79

3.11 VISUAL RESOURCES 79

 3.11.1 Resource Issues and Indicators for Analysis 79

 3.11.2 Affected Environment 80

 Landscape Character 80

 Management Framework 80

 3.11.3 Environmental Consequences 82

 Viewshed Analysis 82

 BLM Contrast Rating Process 82

 Visual Resource Management Conformance 88

 Mitigation Measures 89

 Cumulative Impacts 89

3.12 NOISE 90

 3.12.1 Resource Issues and Indicators for Analysis 90

 3.12.2 Affected Environment 90

 Metrics Descriptions 90

 Federal Guidelines 90

 State and Local Regulations 91

 Background Noise 91

 3.12.3 Environmental Consequences 92

 Proposed Bagdad Mine Stockpile Extension 92

 Proposed 115-kV Power Line Access Roads 93

 Mitigation Measures 93

 Cumulative Impacts 93

3.13 LAND USE / GRAZING 93

 3.13.1 Resource Issues and Indicators for Analysis 94

 3.13.2 Affected Environment..... 94

 Land Use 94

 Grazing 95

 3.13.3 Environmental Consequences..... 96

 Land Use 96

 Grazing 97

 Mitigation Measures..... 98

 Cumulative Impacts..... 98

3.14 EFFECTS OF THE NO ACTION ALTERNATIVES 99

 3.14.1 Proposed Bagdad Mine Stockpile Extension 99

 3.14.2 Proposed 115-kV Power Line Access Roads..... 99

4. CONSULTATION AND COORDINATION 101

4.1 PUBLIC OUTREACH/INVOLVEMENT 101

4.2 TRIBAL CONSULTATION..... 101

4.3 COORDINATION AND/OR CONSULTATION (AGENCIES) 101

4.4 LIST OF PREPARERS 101

5. LITERATURE CITED 103

Appendices

- Appendix A** – Laws and Regulations
- Appendix B** – Bagdad Mine Potential Stockpile Locations
- Appendix C** – APS Proposed Right-of-Way Amendment
- Appendix D** – Biology Survey Report
- Appendix E** – Additional Biological Resources Information
- Appendix F** – Native Plant Seed Mix
- Appendix G** – ADA Notice of Intent to Clear Land Form
- Appendix H** – AGFD Guidelines for Handling Sonoran Desert Tortoises
- Appendix I** – Visual Simulations and VRM Worksheets
- Appendix J** – BLM Tribal Consultation on the Proposed Projects

Figures

Figure 1.1-1. Project location..... 2

Figure 2.2-1. FMBI proposed stockpile extension area. 21

Figure 2.2-2. FMBI proposed monitoring wells and associated access roads and APS proposed access roads. 22

Figure 3.5-1. Surface water features within the vicinity of the project area. 41

Figure 3.5-2. Groundwater features within the vicinity of the project area. 45

Figure 3.7-1. Vegetation resources in the project and analysis areas..... 57

Figure 3.8-1. Wildlife resources in the project and analysis areas..... 67
Figure 3.10-1. Recreation resources in the vicinity of the project area..... 77
Figure 3.11-1. VRM classification of the visual resources analysis area..... 81
Figure 3.11-2. Waste rock stockpile viewshed analysis..... 83

Tables

Table 1.2-1. Applicable Permits for the Bagdad Mine..... 3
Table 1.7-1. Public Scoping Meeting Dates, Locations, and Attendance 8
Table 1.7-2. Agencies and Organizations that Submitted Scoping Comments..... 9
Table 1.7-3. Issue Disposition..... 10
Table 1.7-4. Description and Disposition of Issues Brought Forward during Scoping..... 11
Table 1.7-5. Scoping Issues that Are Out of Scope of the Current Proposals and Eliminated from Further Analysis 17
Table 3.1-1. Supplemental Authority Elements and Rationale for Detailed Analysis for the Proposed Action 28
Table 3.1-2. Additional Resources Considered Not Associated with Supplemental Authorities 29
Table 3.2-1. Standard Definitions of Impact and Resource Impact Descriptions for Magnitude and Duration..... 30
Table 3.4-1. Emissions Inventory in Tons per Year..... 33
Table 3.4-2. Estimated Construction Emissions from the FMBI Proposed Action, in Tons per Year..... 35
Table 3.4-3. Estimated Operational Emissions from the FMBI Proposed Action, in Tons per Year 36
Table 3.4-4. Estimated Construction Emissions from the Proposed APS Access Roads, in Tons per Year 37
Table 3.4-5. Estimated Operational Emissions from Proposed 115-kV Power Line Access Roads, in Tons per Year 37
Table 3.5-1. Surface Water and Groundwater Features in the Analysis Area..... 43
Table 3.5-2. Wells within 1 Mile of Project Area 44
Table 3.7-1. Vegetation Communities in the Project and Analysis Area..... 59
Table 3.7-2. Arizona Native Plant Law Species Identified in the Project Area..... 60
Table 3.10-1. 2014 Hunter Success for GMU 18B 76
Table 3.12-1. Noise Levels Identified to Protect Public Health and Welfare with an Adequate Margin of Safety 91
Table 4.4-1. BLM Interdisciplinary Team 102
Table 4.4-2. Cooperating Agencies..... 102
Table 4.4-3. Third-Party Contractor: SWCA Environmental Consultants..... 102

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ACRONYMS AND ABBREVIATIONS

Document abbreviations

Kingman RMP	<i>Kingman Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement</i>
MPO Modification	<i>Bagdad Mine Stockpile Extension Modification to the Mine Plan of Operations</i> (FMBI 2014); also referred to as the “stockpile extension”

Other abbreviations

°F	degrees Fahrenheit
µg/L	microgram(s) per liter
ADA	Arizona Department of Agriculture
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
amsl	above mean sea level
ANPL	Arizona Native Plant Law
APP	Aquifer Protection Permit
APS	Arizona Public Service
ASLD	Arizona State Land Department
ASMI	Arizona State Mine Inspector
AZPDES	Arizona Pollutant Discharge Elimination System
BADCT	Best Available Demonstrated Control Technology
BLM	Bureau of Land Management
BMP	best management practices
CAA	Clean Air Act
CaCO ₃	calcium carbonate
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
CWA	Clean Water Act
Cyprus	Cyprus Bagdad Copper Corporation
DM	Departmental Manual
EA	Environmental Assessment
EO	executive order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act

FEIS	Final Environmental Impact Statement
FLPMA	Federal Land Policy and Management Act
FMBI	Freeport-McMoRan Bagdad, Inc.
FONSI	Finding of No Significant Impact
Freeport-McMoRan	Freeport-McMoRan, Inc.
g	9.8 m per second
GHG	greenhouse gas
GWP	global warming potential
HAP	hazardous air pollutant
HPTP	Historic Properties Treatment Plan
IM	Instruction Memorandum
IPCC	Intergovernmental Panel on Climate Change
kg/ton	kilogram(s) per ton
KOP	Key Observation Point
kV	kilovolt
MCL	maximum contaminant level
MOA	Memorandum of Agreement
MPO	Mine Plan of Operations
MSGP	Multi-sector General Permit
MSHA	Mine Safety and Health Administration
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NNP	neutralizing potential
N ₂ O	nitrous oxide
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTP	Notice to Proceed
O ₃	ozone
Pb	lead
PLS	pregnant leach solution
PM _{2.5}	particulate matter less than 2.5 microns in diameter
PM ₁₀	particulate matter less than 10 microns in diameter
POD	Plan of Development
RMP	Resource Management Plan
ROD	Record of Decision
ROW	right-of-way

SCAQMD	South Coast Air Quality Management District
SHPO	State Historic Preservation Office
SO ₂	sulfur dioxide
SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
SX/EW	solution extraction/electrowinning
Telesto	Telesto Solutions, Inc.
TMDL	total maximum daily load
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
WRAP	Western Regional Air Partnership
WUS	Waters of the U.S.

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Chapter 1

PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

Freeport-McMoRan Bagdad Inc. (FMBI) owns and operates the Bagdad Mine, a copper and molybdenum open-pit mine located in west-central Yavapai County, immediately west of the unincorporated community of Bagdad, Arizona (Figure 1.1-1). Most of the mine and its associated facilities are located on lands owned by FMBI; however, portions of the mining operation south of the active mine pit are situated on Bureau of Land Management (BLM)-managed lands.

FMBI submitted a request to the BLM Kingman Field Office to authorize a modification to their existing Mine Plan of Operations (MPO) for the extension of the existing, consolidated leach and waste rock stockpile located south of the open pit and two monitoring wells and associated access roads. Arizona Public Service (APS) has also requested an amendment to their existing right-of-way (ROW) for two power line maintenance access roads (APS access roads).

The above requests are the subject of this National Environmental Policy Act (NEPA) Environmental Assessment (EA) analysis. The preparation of this EA is intended to assist the BLM in the decision-making process through the identification, analysis, and public disclosure of potential impacts of the Proposed Actions on the human environment, including but not limited to, environmental, social, and economic impacts (40 Code of Federal Regulations [CFR] 1500.1(c)). The BLM is analyzing the proposed stockpile extension and the proposed APS access roads together in this EA because they are similar actions that share common timing and geography (40 CFR 1508.25(a)(3)). The two Proposed Actions have independent utility, are not parts of a larger proposed project, and do not rely on one another or any other project, for their justification. The proposed stockpile extension includes approximately 79 acres of private land owned by FMBI. While the BLM does not have jurisdiction over these private lands, its decision-making could affect or modify the activities proposed. Therefore, potential impacts to the environment from the proposed activities on these private lands are analyzed in this EA. The BLM is not aware of any other proposed federal or private action that could be considered a connected, cumulative, or similar action.

1.2 PROJECT HISTORY AND BACKGROUND

1.2.1 Bagdad Mine

Mine exploration and operations have been conducted in the Bagdad area since the early 1880s, beginning with the first claim along Copper Creek in 1882 and the subsequent creation of the Eureka Mining District in 1884. In Bagdad's early days, gold, silver, and lead were the main metals produced; copper became the primary commodity after 1900 (BLM 1995). The first mill went into service in 1928 at the mine, which at that time was an underground operation. In 1945, the Bagdad Mine shifted from underground extraction to surface mining with the start of open-pit operations.

The current open-pit mining operation includes mine production (drilling, blasting, and stripping), hauling of materials, milling and flotation, and solution extraction/electrowinning (SX/EW) activities. Facilities that support mine operations and production include the open pit; overburden and mineralized waste rock (leach) stockpiles; SX/EW plant; a milling plant with flotation cells; maintenance shops; fueling stations

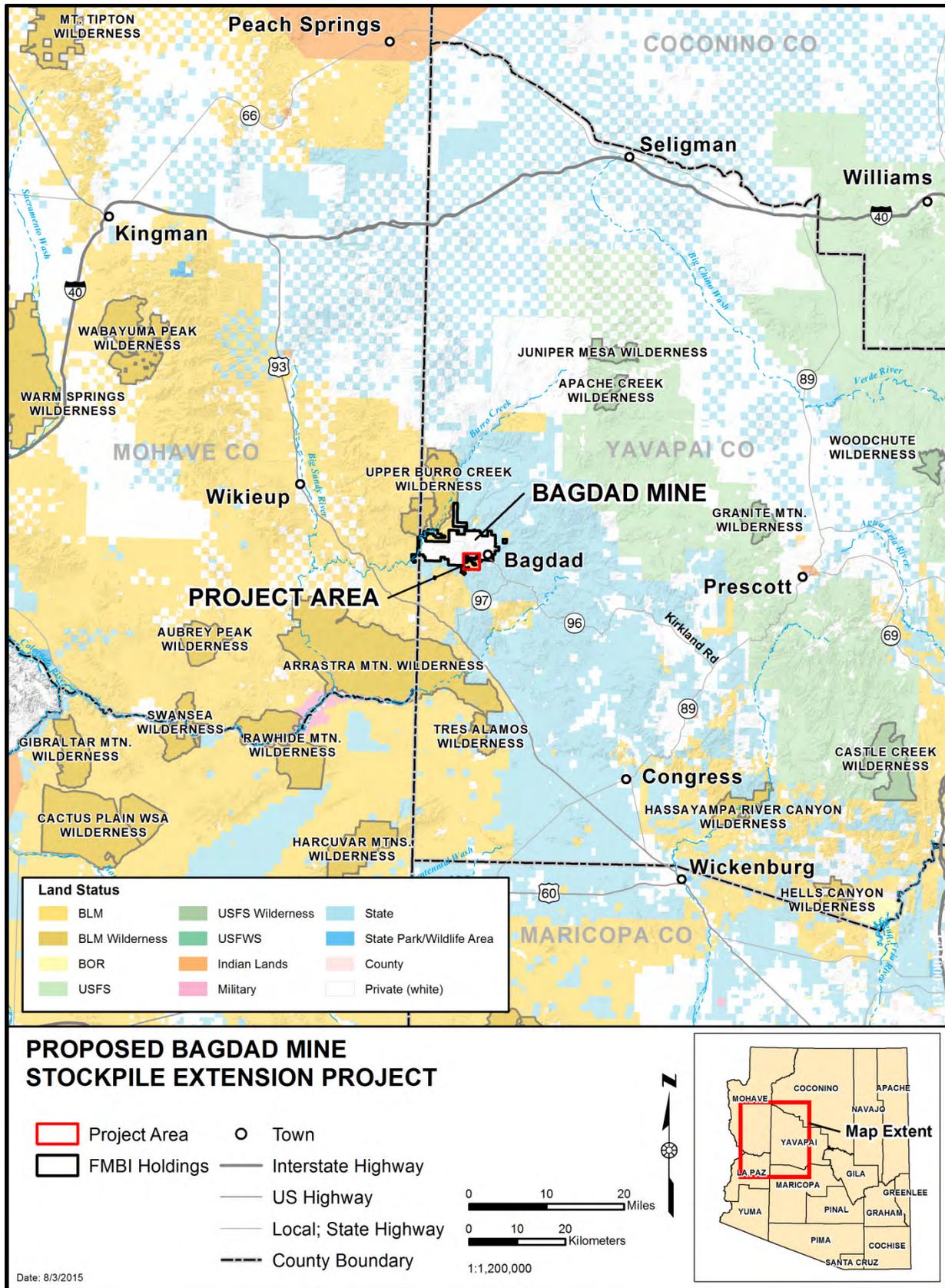


Figure 1.1-1. Project location.

and areas; acid bulk tank stations; an explosives storage area; laydown yards and general storage areas; three tailings impoundments (Upper Mammoth, Mammoth, and Mulholland); and security facilities (FMBI 2014). The Bagdad Mine includes a concentrator that processes 75,000 metric tons of copper and molybdenum ore per day. The mine also produces up to 25 million pounds of copper per year generated from low-grade leaching solution (Freeport-McMoRan Inc. [Freeport-McMoRan] 2013).

FMBI holds the right to extract minerals and conduct mining related activities in the areas incorporated into the FMBI Proposed Action through the ownership of patented claims, as well as the ownership of unpatented claims located on BLM-managed lands. At present, FMBI holds 10 unpatented lode mining claims and 262 unpatented mill site claims that intersect or are within the BLM-managed lands identified for disturbance under the FMBI Proposed Action (FMBI 2014).

Materials generated from the open pit fall into one of three categories: ore, mineralized waste rock, and un-mineralized overburden. The ore is processed in the mill for copper, while the mineralized waste rock is directed to the existing stockpiles. This mineralized waste rock may or may not be leached to recover residual copper, depending on the placement location. The un-mineralized overburden primarily consists of Gila conglomerate and basalt. It is intended to be used in the future during reclamation and closure (FMBI 2014).

The extension of the existing, consolidated Plan IX Leach/South Waste Rock stockpile is the subject of the FMBI Proposed Action in this EA. The existing Plan IX Leach stockpile allows for the extraction of copper from mineralized waste rock. From this portion of the stockpile, pregnant leach solution (PLS) or leachate is collected via gravity in the Alum PLS Sump and Kimberly Pond catchments. The South Waste Rock stockpile accommodates mineralized waste rock, un-mineralized overburden, and relocated tailings, but does not include any leaching activities (FMBI 2014).

1.2.2 Current Permits and Approvals for Bagdad Mine Operations

FMBI holds the necessary state and federal permits and authorizations to conduct mining operations at the existing facilities at the Bagdad Mine. Table 1.2-1 presents a summary of the applicable permits for the Bagdad Mine.

Table 1.2-1. Applicable Permits for the Bagdad Mine

Regulatory Framework	Permit Number	Description	Issuing Agency
Land Permits			
BLM Surface Management Regulations (43 CFR 3809)	AZA-28639	See Section 1.2.3 below	BLM
Arizona State Mine Inspector (Mined Land Reclamation Act)		Reclamation Plan (Cyprus Bagdad Copper Corporation 1997)	Arizona State Mine Inspector
Water Permits			
Clean Water Act	AZ0022268	Arizona Pollutant Discharge Elimination System (AZPDES) Permit for discharges to Copper Creek, Mulholland Wash, and Mammoth Wash	Arizona Department of Environmental Quality (ADEQ)
	AZMSG-64654 (AZ Mining MSGP-2010 Authorization Number)	AZPDES Multi-Sector General Permit: Sector G – Metal Mining (Pre Mining and Dressing) and Sector J – Non-Metallic Mineral Mining and Dressing	ADEQ

Table 1.2-1. Applicable Permits for the Bagdad Mine (Continued)

Regulatory Framework	Permit Number	Description	Issuing Agency
	Oil Pollution Prevention	CWA Section 311 – Spill Prevention Control and Countermeasure Plan	U.S. Environmental Protection Agency (EPA)
Aquifer Protection Permit	P-105258	Area-wide Permit	ADEQ
Arizona Department of Water Quality (ADWR) Permitting	Various permits	Compliance with ADWR programs for the management of the drilling of groundwater wells and the use of groundwater and surface water, including <ul style="list-style-type: none"> • drilling and water use; • appropriations of surface water; and • withdrawal and use of groundwater. 	ADWR
Air Permit			
Air Quality	60433	Class II Synthetic Minor Air Quality Permit	ADEQ
Hazardous Waste Permit			
Resource Conservation and Recovery Act	HW EPA ID AZD-083717843	Small Quantity Generator	EPA

Note: Table adapted from FMBI (2014).

Mining-relating surface disturbance activities on BLM-managed lands are subject to the regulations under 43 CFR 3809, which requires an MPO. In July 1995, Cyprus Bagdad Copper Corporation (Cyprus [predecessor to FMBI]) submitted to the BLM the *Plan of Operations for Tailings Facility and South Waste Rock Disposal Facility (Revision No. 4)* (Cyprus 1995). The BLM issued the Final Environmental Impact Statement (FEIS) (*Cyprus Bagdad Copper Corporation Proposed Tailings and Waste Rock Storage Areas, Final Environmental Impact Statement*) in 1996 (BLM 1996a). After the issuance of the FEIS, the draft MPO was updated to incorporate mitigation measures required by the Record of Decision (ROD), which was issued on March 5, 1996 (BLM 1996b).

The *Plan of Operations for Upper Mammoth Tailings & South Waste Rock Disposal Facilities (Revision No. 5)* and subsequent amendments approved in 1997, 2005, and 2011 (collectively, the 1996 MPO) is the approved and current MPO for the Bagdad Mine (Cyprus 1996).

Under the approvals granted by the 1996 MPO and amendments, approximately 671 acres of BLM lands in Sections 8 and 9, Township 14 North, Range 9 West are authorized for mining-related activities and surface disturbance by FMBI. These previously approved lands represent all of the BLM-managed lands within Sections 8 and 9.

FMBI (2014) submitted the *Bagdad Mine Stockpile Extension Modification to the Mine Plan of Operations* (MPO Modification) to the BLM in 2014 to modify the 1996 MPO for the extension of the existing stockpile. Throughout this document, FMBI's proposed *Bagdad Mine Stockpile Extension Modification to the Mine Plan of Operations* (MPO Modification) is referred to as the "stockpile extension" or the "FMBI Proposed Action" and includes two monitoring wells and related access roads.

1.2.3 Current Approvals of the APS Power Line ROW

The BLM Kingman Field Office completed an EA in April 2009 (BLM 2009a) to examine and determine impacts of an APS request for a ROW grant to relocate an existing 115-kilovolt (kV) transmission line

within BLM public land in the vicinity of the Bagdad Mine. Based on the EA, the BLM determined that the ROW and associated transmission line relocation activities would not have significant impacts on the human environment and issued a Finding of No Significant Impact (FONSI). Following the FONSI, BLM issued the ROW grant to approve the 3.63-mile-long, 100-foot-wide transmission line ROW corridor. In June 2014, the BLM issued a Notice to Proceed (NTP) to APS, granting APS permission to construct the transmission line within the 100-foot ROW under the stipulations contained in the ROW grant. The NTP did not approve disturbance outside of the 100-foot ROW corridor, thus requiring analysis and request for approval through this EA.

For the portion of the power line that extends south of the BLM ROW, APS applied for a ROW with the Arizona State Land Department (ASLD) on April 25, 2008. ROW 14-113067 was issued by ASLD on July 30, 2010, for a term of 50 years. The ROW covers 8.93 acres in Sections 20 and 21, Township 14 North, Range 9 West, and provides for a 100-foot-wide aboveground power line and a 20-foot-wide access road on Arizona state trust land.

Throughout this document, the APS proposed power line access roads are referred to as the “APS access roads” or the “APS Proposed Action.”

1.3 PURPOSE OF AND NEED FOR ACTION

BLM’s purpose is to provide FMBI with a location for their requested stockpile extension, including two associated monitoring well locations and well access roads, to ensure compliance with BLM’s 43 CFR 3809 and 3715 regulations. The purpose is also to analyze and consider whether or not to amend APS’s ROW to provide the maintenance access requested to ensure compliance with the 43 CFR 2800 regulations. The need is established under the Federal Land Policy and Management Act (FLPMA) to respond to a technically complete proposed modification to an MPO and a request for ROW amendment for legal access.

1.4 DECISIONS TO BE MADE

The decisions the BLM would make include the following options:

1. Approve the stockpile extension with no modifications; approve the stockpile extension with certain conditions needed to prevent unnecessary or undue degradation of public lands; or deny the approval of the stockpile extension as currently written and not authorize the project if it is found that the Proposed Action does not comply with the 3809 regulations and the FLPMA mandate to prevent unnecessary or undue degradation.
2. Approve or deny the APS access roads request as proposed or with modifications to mitigate potential environmental impact.

The deciding official for both actions will be the BLM Kingman Field Manager.

1.5 RESOURCE MANAGEMENT PLAN CONFORMANCE

Resource management planning regulations mandate that all actions approved or authorized by the BLM, including those proposed actions on BLM-managed lands, be reviewed for conformance with existing land use plans (43 CFR 1610.5-3) (516 Departmental Manual [DM] 11.5 [BLM 2009b]). A proposed

action and alternatives should be consistent with the applicable land use plan and clearly in agreement with the terms, conditions, and decisions of the approved plan (BLM 2008).

The proposed stockpile extension and proposed APS access roads are located within the administrative boundaries of the Kingman Field Office in the Colorado River District. The *Kingman Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement* (Kingman RMP) provides resource management direction for these lands through standards and guidelines for all resources and resource uses (BLM 1993). The Kingman RMP was approved in March 1995.

In keeping with the BLM's Multiple Use mandate as directed in FLPMA, exploration and development of mineral resources is encouraged under the Kingman RMP. The proposed stockpile extension and APS access roads are consistent actions under the Kingman RMP. The RMP also provides guidance, best management practices (BMPs), and constraints for mineral development and linear ROWs, which includes the proposed stockpile extension and the proposed APS access roads.

1.6 APPLICABLE LAWS, STATUTES, AND REGULATIONS

Federal regulations require that all MPOs (43 CFR 3809.411) and all ROWs (43 CFR 2804.25(d)) granted under the FLPMA be analyzed in accordance with NEPA and Council on Environmental Quality (CEQ) regulations contained in 40 CFR 1500–1508. The BLM retains responsibility for compliance with NEPA. Under NEPA requirements, BLM must also coordinate with other federal, state, and local agencies whose responsibilities may include some aspects of the Proposed Actions.

There are a number of laws, policies, and orders that BLM considers in analyzing the proposed stockpile extension and proposed APS access roads (Appendix A).

The National Environmental Policy Act of 1969 calls on federal, state, and local governments to cooperate on project proposals and allows federal agencies to invite tribal, state, and local governments and other federal agencies to serve as cooperating agencies in the NEPA process. The cooperating agencies assisting the BLM with this EA include ASLD, Arizona Game and Fish Department (AGFD), and Mohave County.

1.6.1. General Mining Law of 1872 and BLM Oversight

Locatable mineral activities conducted on federal land are authorized under the General Mining Law of 1872 (as amended) (30 United States Code [USC] 21–42). BLM's regulatory responsibilities for oversight of mining activities on federal lands are provided for in 43 CFR 3700 and 3800. BLM ensures that an operator and any locatable mining proposal prevent unnecessary or undue degradation of public lands. As defined, unnecessary and undue degradation means any condition, activity, or practice that

- Fails to comply with the performance standards provided under 43 CFR 3809.420,
- Fails to comply with the terms of conditions of an approved plan of operations,
- Fails to comply with other federal and state laws related to environmental protection and protection of cultural resource,
- Is not “reasonably incident” to prospecting, mining, or processing operations as defined under 43 CFR 3715, or
- Fails to attain a state level of protection or reclamation required by specific laws in areas such as the BLM-administered portions of the National Wilderness System or BLM-administered National Monuments and National Conservation areas.

Mining operations on BLM-managed lands must be conducted in accordance with an approved MPO. An MPO must contain all information as described under 43 CFR 3809.401.

When a proposed MPO or its modification is complete and deemed ready for environmental analysis, BLM initiates a review under NEPA. BLM also initiates coordination with other agencies, including consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA), consultation with the State Historic Preservation Office (SHPO) under the National Historic Preservation Act (NHPA), and compliance with the Clean Water Act (CWA), Federal Water Pollution Control Act, Clean Air Act (CAA), Solid Waste Disposal Act, and Arizona Aquifer Protection Program.

Numerous measures to reduce impacts on the surrounding environment are typically described in the proposed MPO, but specific stipulations and/or mitigating measures are developed during the NEPA process (usually once the NEPA process is nearing completion, a preferred alternative has been identified, and both BLM and the operator can be reasonably certain of how future mining activities, if approved, would be conducted). Mitigating measures to the operator's proposed MPO are then included as "conditions of approval" in the BLM decision document.

When submitting a new MPO, the operator must provide the BLM with a Reclamation Cost Estimate that meets the requirements of 43 CFR 3809.552(a) and 3809.554(a), and must be acceptable to the BLM as required by 43 CFR 3809.554(b). If and when an existing MPO is proposed to be modified, the operator must provide BLM with an estimate of the reclamation costs for all components of the existing and proposed operation that will be affected by the modification; this revised estimate for modification-related activities, once reviewed and accepted by BLM, and once an acceptable financial instrument (see 43 CFR 3809.555) in the specified amount has been posted, becomes a record of financial guarantee of reclamation.

1.6.2. FLPMA and BLM Rights-of-Way

ROWs are authorized on BLM-managed lands through the regulations at 43 CFR 2800, promulgated from the FLPMA. ROWs are issued, modified, and renewed at the discretion of the BLM field manager. Any ROW action evaluated by BLM will include compliance with the NEPA and appropriate measures and mitigations to minimize potential environmental impacts.

1.7 PUBLIC SCOPING

Scoping is one of the first steps and an integral part of the NEPA process. It is an early and open process for determining the scope of issues to be addressed in the NEPA process and for identifying the potentially significant issues related to the Proposed Actions (40 CFR 1501.7). Information collected during scoping is also used to develop alternatives to the Proposed Actions that are analyzed in the NEPA process. The objectives of the scoping process are to

- increase public awareness and understanding of public lands stewardship through meaningful and productive constituent and local stakeholder involvement in the development of the NEPA document;
- engage federal, state, local, and tribal governments and the public in the early identification of concerns, potential impacts, and possible alternative actions;
- determine the scope and issues to be analyzed;
- identify potentially significant issues related to the Proposed Actions;

- identify and eliminate issues that are not significant or that have been covered by prior environmental review;
- identify the scope of issues to be addressed and integrate analyses required by other environmental laws (e.g., ESA, NHPA); and
- identify technical studies needed to adequately address the potential impacts of the proposed project.

The process involves both internal and external scoping. Internal scoping is conducted within an agency to determine preliminary issues and concerns. External scoping provides an opportunity for members of the public to learn about the Proposed Actions and to share any concerns or comments they may have. Input from the scoping process (internal and external) is used to help the lead agency identify issues and concerns to be considered in the NEPA process, as well as to identify potential alternatives. In addition, the scoping process helps identify any issues that are not considered relevant, and can therefore be eliminated from detailed analysis in the EA. The list of stakeholders and other interested parties is also updated and generally expanded during the scoping process.

As the lead agency, the BLM conducted internal scoping for the proposed stockpile extension and APS access roads (the Proposed Actions) in August and September 2014. BLM resource staff reviewed the Proposed Actions, identified preliminary issues and concerns, and determined preliminary data necessary for completion of the NEPA analysis.

The public scoping process was initiated on October 6, 2014, by publishing a Legal Notice in several newspapers and mailing a scoping notice to a mailing list of interested persons, organizations, and government agencies. Initially, the BLM planned for a 30-day period for submitting scoping comments, which was scheduled to end on November 4, 2014. Based on requests from the public, the scoping period was extended to a 45-day period and ended on November 19, 2014.

The BLM hosted five public meetings in October and November 2014 (Table 1.7-1). A total of 74 people signed in at the meetings. At the meetings, the project leaders provided brief summaries about the NEPA process and the proposed project and took verbal comments and questions from meeting attendees. The open-house format was designed to allow attendees to view informational displays, ask specialists about the proposed Bagdad Mine Stockpile Extension Project and the NEPA process, and submit written comments on-site. Members of the public were provided with comment forms, fact sheets, and visual displays to learn about the proposed project details. Participants were also encouraged to join the mailing list.

Table 1.7-1. Public Scoping Meeting Dates, Locations, and Attendance

Meeting Location	Meeting Date	Time of Meeting	Number of People Who Signed In
Peach Springs, AZ	October 22, 2014	4:00 p.m. – 7:00 p.m.	10
Wikieup, AZ	October 23, 2014	5:00 p.m. – 7:30 p.m.	16
Bagdad, AZ	October 28, 2014	5:00 p.m. – 7:30 p.m.	11
Prescott, AZ	October 29, 2014	5:00 p.m. – 7:30 p.m.	13
Wikieup, AZ	November 12, 2014	5:00 p.m. – 7:30 p.m.	24

In total, 29 submittals were collected during public scoping. These 29 submittals consisted of 111 individual comments. Table 1.7-2 lists the number of submittals and comments by submitter type

(individual, government, organization, business). It also lists the agencies, organizations, and tribes that submitted comments.

Table 1.7-2. Agencies and Organizations that Submitted Scoping Comments

Submitter Type	Name	Submittal Count	Comment Count
Individual	See Scoping Report	19	70
Government	USFWS; AGFD; Mohave County (2 submittals); Yavapai County	5	19
Organization	Sierra Club; Arizona Mining Association; Concerned Citizens of Wikieup; Western Watersheds Project	4	10
Business	FMBI	1	12
Total		29	111

Internal and external comments obtained during the scoping period were used to define the relevant issues that would be addressed in the EA, as well as to assist in the development of alternatives to the Proposed Actions.

The final phase included identifying statements of public concern and preparing a narrative scoping report, *Bagdad Stockpile Extension Project Final Scoping Report* (BLM 2015a). The statements of concern are a compilation of comments received from the public and various agencies during public scoping. The scoping report provides representative statements that capture, with minimal repetition, all major concerns expressed during the public comment period. The statements identified and analyzed within the report are not necessarily verbatim iterations of comments received but in many cases include similar or exact phrasing.

1.7.1. Issues Identified During Scoping

Comments and concerns expressed during the agency and public scoping period were grouped by theme into the following resource categories:

- Air quality
- Biological resources
 - Springs/wetlands/riparian areas
 - Bats/wildlife
 - Special-status species
 - Vegetation and invasive species
- Cultural resources
- Health and safety
- Land use
- Mine reclamation
- NEPA process
- Noise
- Public access and recreation
- Rangeland and livestock grazing
- Socioeconomics
- Tribal resources
- Visual resources
- Water resources
- Cumulative impacts

From the comments associated with these resource areas, issue statements were developed that describe the issues and concerns identified during scoping. Each issue statement was reviewed relative to the Proposed Actions and the NEPA process. Using the disposition categories described below in Table 1.7-3, each issue was evaluated and assigned a category for how it relates to and will be addressed through the NEPA process. Table 1.7-4 presents the issues identified during scoping and the accompanying dispositions. All issues categorized as “out of scope” and the accompanying rationales are described below in Section 1.7.2 in Table 1.7-5.

Table 1.7-3. Issue Disposition

Disposition	Explanation
Process	Identifies certain elements of the NEPA process that must be documented and disclosed, but does not require specific resource analysis in the NEPA document.
Purpose and Need	Requires additional documentation or clarification of the project's Purpose and Need.
Alternatives Development	Requires refinement of proposed action or analysis of existing alternatives or consideration of new alternatives.
Impact Analysis	Requires analysis of impacts to specific resources of concern.
Out of Scope	Analysis of the issue is not necessary to make a reasoned choice between alternatives or the issue is not associated with a potentially significant direct, indirect, or cumulative impact, or analysis is not necessary to determine the significance of the impacts.

1.7.2. Issues Eliminated from Detailed Analysis

Issues outside the scope of the EA are defined as those issues that are not directly related to decisions to be made regarding the proposed stockpile extension and APS access roads (the Proposed Actions) as well as issues that are not relevant to the purpose of and need for the actions (see Section 1.3).

The following issues were considered, but have been eliminated from further detailed analysis because they are beyond the scope of this EA.

The majority of the Bagdad Mine operations, tailings, other stockpiles, and processing facilities are located on private land. The Proposed Action for this NEPA project, as related to mine operations, is to expand the existing Bagdad Mine stockpile farther onto BLM-managed lands and private lands. FMBI has adequate private land available on which to develop an additional stockpile site (see Appendix B, Table B-2, for descriptions of private and BLM lands evaluated as options for stockpile development). They have chosen to locate the stockpile extension on BLM lands, and can do so because of their existing mining claims and rights granted through the Mining Law. Because there are alternative locations for the proposed stockpile extension on private lands, any expansion or continuation of the Bagdad Mine operations is **not dependent** upon approval of the FMBI Proposed Action. FMBI does not require any new federal permits to continue the ongoing mining, processing, and production of copper from the Bagdad Mine. The ongoing activities at the Bagdad Mine are not within the BLM's scope of analysis, as those activities are not affected by a BLM decision.

The common characteristic that renders most of the socioeconomic, health and safety, NEPA, and water usage issues identified in Table 1.7-5 out of scope is that the stockpile extension does not make a change to any of them, so they are not connected to the major federal action requiring NEPA analysis. In other words, even if the BLM denies the proposed stockpile extension, the mine would use the same amount of water from the same sources, would expand the pit the same amount and direction, and would continue mining for the same length of time. The federal decisions on the stockpile extension will not have an effect on those aspects of the mining operation. Therefore, they are not actions connected to the major federal action of approving the stockpile extension and do not need to be considered (BLM NEPA Handbook 6.5.2.1 [BLM 2008]). Similarly, the proposed APS access roads would have no known effect on the resource issues identified in Table 1.7-5 and, therefore, these issues are not included in the NEPA analysis of the APS proposal.

Table 1.7-4. Description and Disposition of Issues Brought Forward during Scoping

Resource Topic	Issue	Disposition	
Air Quality	How would the Proposed Actions impact air quality, specifically dust emissions, in the project area vicinity, and how are these emissions regulated?	Impact Analysis	
	How will air quality (emission levels particulate matter 10 [PM ₁₀], CAA compliance) be impacted by the stockpile extension?	Impact Analysis	
	What are the required BMPs for reducing impacts to air quality?	Impact Analysis	
	How will the Proposed Actions and alternatives affect water flow at Mountain Spring?	Impact Analysis	
	Is there wetland vegetation present at Mountain Spring? If so, will it be retained? If not retained, what would the effects be on the riparian/wetland vegetation?	Impact Analysis	
	Will wildlife access to Mountain Spring surface water be retained? If not, what would the effects be on wildlife with no or limited access to the surface water at the spring?	Impact Analysis	
	Will water be retained at spring sites? If not, what would the effects be on riparian/wetland vegetation?	Impact Analysis	
	Is there wetland vegetation at spring sites? If so, will it be retained? If not, what would the effects be on riparian/wetland vegetation?	Impact Analysis	
	Will wildlife access to spring water be retained? If not, what would the effects be on wildlife with no or limited access to surface water at springs?	Impact Analysis	
	Will there be effects on riparian/wetland vegetation and wildlife dependent on it (including amphibians, birds, and bats)?	Impact Analysis	
Biological Resources – Springs/Wetlands/Riparian Areas	What would the effects of a breach into Burro Creek be on riparian obligate and facultative species that use Burro Creek as habitat?	Out of Scope	
	How would the Proposed Actions and alternatives affect wildlife in the project area and vicinity, including the Gila monster and bighorn sheep reintroduced into the region?	Impact Analysis	
	How would potential contaminated drainage from the project area affect wildlife in Burro Creek?	Out of Scope	
	How would potential contaminated water in the project area affect the area's wildlife?	Impact Analysis	
	Will the Proposed Actions or alternatives affect old mine features or caves that could harbor bat roosts?	Impact Analysis	
	Will old mine features, especially adits and shafts, or caves, be affected by the Proposed Actions or alternatives? How many would be affected, and what would the impacts be?	Impact Analysis	
	What would the effects be on roosting bats from the Proposed Actions and alternatives?	Impact Analysis	
	How would distributed facilities and roads proposed in the Proposed Actions and alternatives fragment wildlife habitat? What would the effects be on big game, mesofauna, pronghorn, bighorn sheep, desert tortoise, bats, migratory birds, and other wildlife?	Impact Analysis	
	Biological Resources – Bats/Wildlife	How would the Proposed Actions and alternatives affect wildlife in the project area and vicinity, including the Gila monster and bighorn sheep reintroduced into the region?	Impact Analysis
		How would potential contaminated drainage from the project area affect wildlife in Burro Creek?	Out of Scope
How would potential contaminated water in the project area affect the area's wildlife?		Impact Analysis	
Will the Proposed Actions or alternatives affect old mine features or caves that could harbor bat roosts?		Impact Analysis	
Will old mine features, especially adits and shafts, or caves, be affected by the Proposed Actions or alternatives? How many would be affected, and what would the impacts be?		Impact Analysis	
What would the effects be on roosting bats from the Proposed Actions and alternatives?		Impact Analysis	
How would distributed facilities and roads proposed in the Proposed Actions and alternatives fragment wildlife habitat? What would the effects be on big game, mesofauna, pronghorn, bighorn sheep, desert tortoise, bats, migratory birds, and other wildlife?		Impact Analysis	
Biological Resources – Bats/Wildlife		How would the Proposed Actions and alternatives affect wildlife in the project area and vicinity, including the Gila monster and bighorn sheep reintroduced into the region?	Impact Analysis
		How would potential contaminated drainage from the project area affect wildlife in Burro Creek?	Out of Scope
		How would potential contaminated water in the project area affect the area's wildlife?	Impact Analysis
	Will the Proposed Actions or alternatives affect old mine features or caves that could harbor bat roosts?	Impact Analysis	
	Will old mine features, especially adits and shafts, or caves, be affected by the Proposed Actions or alternatives? How many would be affected, and what would the impacts be?	Impact Analysis	
	What would the effects be on roosting bats from the Proposed Actions and alternatives?	Impact Analysis	
	How would distributed facilities and roads proposed in the Proposed Actions and alternatives fragment wildlife habitat? What would the effects be on big game, mesofauna, pronghorn, bighorn sheep, desert tortoise, bats, migratory birds, and other wildlife?	Impact Analysis	

Table 1.7-4. Description and Disposition of Relevant Issues Brought Forward during Scoping (Continued)

Resource Topic	Issue	Disposition
Biological Resources – Special Status Species	How would the Proposed Actions and alternatives affect big-game use and movement through the proposed waste rock area and distributed facilities area? How are these areas connected to adjacent lands, i.e., is there development surrounding the lands proposed to be disturbed? Are these lands essentially undeveloped? What would the cumulative impacts of disturbance of an additional 640 acres of grassland and 18 acres of Arizona upland habitats be on wildlife and big-game use and movement through these areas?	Impact Analysis
	How much wildlife habitat (in acres) will be lost or degraded due to surface disturbance, vegetation removal, and increased human activity from the Proposed Actions and alternatives? What are the impacts from this loss?	Impact Analysis
	How would the water quality of free-standing water and water impoundments affect wildlife, including bats, under the Proposed Actions and alternatives?	Out of Scope
	What would the effects on aquatic species (i.e., fish, amphibians, macroinvertebrates) be from a breach of contaminants into Burro Creek?	Out of Scope
	How would the Proposed Actions and alternatives affect the Sonoran desert tortoise and the Arizona cliffrose?	Impact Analysis
	How will the area be surveyed for special status species, including the Sonoran desert tortoise?	Impact Analysis
	How would the Proposed Actions and alternatives affect the southwestern willow flycatcher and critical habitat, yellow-billed cuckoo and critical habitat; northern Mexican gartersnake and critical habitat; Yuma clapper rail, razorback sucker, bonytail chub, Sonoran desert tortoise, lowland leopard frog, and other amphibians and reptiles in the Bill Williams watershed, including impacts to riparian habitat?	Out of Scope
	How would the Proposed Actions and alternatives affect the zone-tailed hawk and black hawk in the area of Burro Creek and the Bill Williams watershed?	Out of Scope
	How would the Proposed Actions and alternatives affect the bald eagle and golden eagle?	Impact Analysis
	How would sensitive and special status species (including "proposed" and "candidate" threatened and endangered species) be affected by the Proposed Actions and alternatives, including, but not limited to, gilded flickers (if Sonoran desert vegetation), Townsend's big-eared bat, cave myotis, greater western mastiff bat, Aquarius milkvetch (if any limestone outcrops), California flannelbush (in shady canyons), Kearny sumac (in shady canyons), and Parish wild onion?	Impact Analysis
What Sonoran desert tortoise habitat would be affected by the Proposed Actions and alternatives? Would there be long-term effects (greater than 10 years) on tortoise or tortoise habitat?	Impact Analysis	
What impacts would there be to migratory birds from the Proposed Actions and alternatives?	Impact Analysis	
How would the water quality of free-standing water and water impoundments affect migratory birds, including raptors, in the area?	Out of Scope	
Are any BLM sensitive, state, or federal listed species and/or designated critical habitat present? Would they be adversely affected by the Proposed Actions and alternatives?	Impact Analysis	
How will facilities, especially power lines, affect raptors? Would design include raptor-proof power lines?	Out of Scope	
What would the impact be to other species of wildlife from providing new perch and nesting sites to raptors under the Proposed Actions and alternatives?	Out of Scope	

Table 1.7-4. Description and Disposition of Relevant Issues Brought Forward during Scoping (Continued)

Resource Topic	Issue	Disposition
Biological Resources – Vegetation/Invasive Species	What would the effects be on vegetation from the Proposed Actions and alternatives?	Impact Analysis
	What would the effects be of 150 acres of surface-disturbing activities (distributed facilities, Proposed Actions) on vegetation?	Impact Analysis
	How would the loss of vegetation and ecological function (hydrology, habitat integrity, wildlife use, livestock use) of over 640 acres of grassland habitat and 18 acres of Arizona Upland habitat affect the above resources?	Impact Analysis
	Are there plants covered by the Arizona Native Plant Law within the project area? How will they be treated? What would the impacts be to succulents that occur within the footprint of the Proposed Actions and alternatives? Plants listed for salvage in the Arizona Native Plant Law include cacti, yucca, nolina, agave, and ocotillo. How would plant salvage be accomplished?	Impact Analysis
	How would vegetation removal for facilities and roads affect soil erosion over the footprint of the waste rock extension and distributed facilities areas?	Impact Analysis
	How would soils be affected by vegetation removal and alteration of water flow patterns resulting from the Proposed Actions and alternatives (including waste rock extension; facilities and road development; use and maintenance of roads and facilities over the entire footprint of the waste rock extension and distributed facilities area)?	Impact Analysis
	Are any BLM sensitive, state, or federal listed plant species present? Would they be adversely affected by the Proposed Actions or alternatives?	Impact Analysis
	How would surface disturbance affect invasion of invasive plants?	Impact Analysis
	What is the expected time frame for reclamation? How would this affect wildlife habitat reclamation?	Impact Analysis
	How will the National Register of Historic Places eligible site within the footprint of the stockpile be affected?	Impact Analysis
Cultural Resources	How will the Proposed Actions affect the area of interest to the Hualapai Tribe in the vicinity of Mountain Spring?	Impact Analysis
	What will the effect on cultural resources be within the area described as the distributed facilities area?	Impact Analysis
	How would the Proposed Actions and alternatives affect the area's cultural resources, and how will the area be surveyed for identifying cultural resources?	Impact Analysis
Health and Safety	How would the Proposed Actions affect safety in the vicinity of the Proposed Actions through the removal of fire-prone vegetation and abandoned mine sites?	Impact Analysis
	How would the Proposed Actions affect health and safety in the Wikieup area related to fire and safety issues and ongoing water removal for mine operations from the Big Sandy area?	Out of Scope
Land Use	How would the Proposed Actions impact future land use in the project area?	Impact Analysis
	How does existing land use, including patented and unpatented mining claims in the project area, affect the NEPA process?	Impact Analysis Process Alternatives Development
Geology and Soils	What is the potential for the Proposed Action to cause acid rock drainage off the stockpile site?	Impact Analysis

Table 1.7-4. Description and Disposition of Relevant Issues Brought Forward during Scoping (Continued)

Resource Topic	Issue	Disposition
NEPA Process	How will the BLM consult with government agencies in the NEPA process, including Mohave County, AGFD, USFWS, U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers?	Process
	How will the BLM improve public notification of the NEPA process to better communicate meetings and milestones?	Process
	How will the Proposed Actions description be revised to include suggested edits proposed in public scoping, including adding more specificity and details regarding proposed projects in the distributed facilities area?	Alternatives Development
	How will the BLM revise the purpose and need to include suggested edits in the public scoping comments?	Purpose and Need
	How will the Proposed Actions and the NEPA analysis include expansion of the mine pit and operations?	Out of Scope
Noise	How would noise from the Proposed Actions and alternatives affect wildlife and wildlife movement?	Impact Analysis
	How would noise from the Proposed Actions and alternatives affect adjacent property owners and residents?	Impact Analysis
	How would the Proposed Actions affect future access to private and recreational lands in the project area vicinity?	Impact Analysis
Public Access and Recreation	What will the effect of the stockpile extension be on off-highway vehicle routes used by recreationists?	Impact Analysis
	How will the stockpile extension affect dispersed recreation opportunities (e.g., hunting, camping, hiking, wildlife viewing) in the vicinity of the proposed stockpile?	Impact Analysis
	How will changes in surface water flow affect erosion of existing access routes?	Impact Analysis
	How would the Proposed Actions affect grazing leases in the project area, and would retirement of grazing leases in the region be available for project mitigation?	Impact Analysis
Rangeland and Livestock Grazing	What will the effects be on grazing permits in the area?	Impact Analysis
	How will the stockpile extension affect waters used by livestock?	Impact Analysis
	What are the economic impacts of the Proposed Actions to the area, regional, and state economies?	Impact Analysis
	What are the socioeconomic impacts (beneficial and negative) to the BLM and the local and regional vicinity?	Impact Analysis
	How would the Proposed Actions impact the economics of grazing leases in the project area?	Impact Analysis
Socioeconomics	How would water usage associated with the Proposed Actions impact socioeconomic, including the ranching industry, in the Wikeup area?	Out of Scope
	How will Tribes and the Bureau of Indian Affairs be consulted in the NEPA process, including the Hopi Tribe, Hualapai Tribe, Colorado River Indian Tribes, and the Yavapai Apache Nation?	Process
Tribal Resources	How will BLM assess changes to the visual characteristics of the area?	Impact Analysis
Visual Resources	How do the RMP Visual Resource Management objectives affect the Proposed Actions or alternatives?	Impact Analysis
	What would the effect of the Proposed Actions and alternatives be on surface-water and groundwater quality in the project area and area watershed? Specifically, what would the impact be on the Burro Creek and Santa Maria Subbasins in terms of heavy metals?	Impact Analysis

Table 1.7-4. Description and Disposition of Relevant Issues Brought Forward during Scoping (Continued)

Resource Topic	Issue	Disposition
	Will the actions affect the quantity of water needed?	Impact Analysis
	How would the NEPA document address water usage at the Bagdad Mine and how it relates to removing water from the Big Sandy area and Wikeup? What would the effects of the Proposed Actions and Bagdad Mine operations be, as related to water usage, on water availability in the Wikeup area?	Out of Scope
	What will be the source of water and the quantity of water needed for the Proposed Actions?	Out of Scope
	How will the project affect groundwater quality, including fate, transport, tailings seepage, and capture of pregnant heap leach solution?	Impact Analysis
	Might the project result in surface water runoff into Burro Creek and the Santa Maria basin, and would it affect the proposed Wild and Scenic River segments and associated resources?	Out of Scope
	What are the water quality standards and status of Burro Creek and Boulder Creek (total maximum daily load)?	Impact Analysis
	What are the water quality standards and status for the area's groundwater (maximum contaminant levels for metals)?	Impact Analysis
	What would the impact be of mine contaminants breaching into Burro Creek and the Burro Creek Wilderness via the Butte Creek watershed? Is it likely that mine contaminants would drain into Burro Creek via Butte Creek? How uncertain is such an event?	Out of Scope
	How often is a breach likely to happen, and how can it be mitigated?	Out of Scope
	How controversial would the breach of contaminants into Burro Creek be?	Out of Scope
Cumulative Impacts	What are the plans for mine expansion onto private lands and state trust lands? How are private and state trust lands expected to be developed by mining connected to the existing disturbed mining areas and to the areas within all alternatives?	Impact Analysis
	How many acres of private and state trust land would be affected by a mining footprint?	Impact Analysis
	How many cumulative acres are expected to be permanently disturbed by waste rock dumping, distributed facilities, and road development for mining purposes on public, private, and state trust lands?	Impact Analysis
	How many cumulative acres of wildlife habitat are expected to be fragmented by waste rock dumping, distributed facilities, and road development for mining purposes on public, private, and state trust lands? What would the cumulative impacts from habitat fragmentation to wildlife be in a state and regional context?	Impact Analysis
	What would the cumulative impact of mine expansion and development onto private lands and state trust lands be to wildlife, soils, special-status species, pronghorn, bighorn sheep, other big game, migratory birds, riparian habitats, surface and subsurface water, vegetation, bats, aquatic species, riparian obligate and facultative species, raptors, cultural resources, visual resources, recreational resources, and livestock grazing resources?	Impact Analysis
	In a state context, what are the cumulative impacts to wildlife movement and wildlife use of public, private, and state trust lands expected from development of the lands for mining under all alternatives?	Impact Analysis
	In a landscape/regional context, what would the cumulative effects be on wildlife movement and use on public, private, and state trust lands located adjacent to areas expected to be developed for mining?	Impact Analysis

Table 1.7-4. Description and Disposition of Relevant Issues Brought Forward during Scoping (Continued)

Resource Topic	Issue	Disposition
	<p>What would the cumulative impact to wildlife, soils, special status species, pronghorn, bighorn sheep, other big game, migratory birds, riparian habitats, surface and subsurface water, vegetation, bats, aquatic species, riparian obligate and facultative species, raptors, cultural resources, visual resources, recreational resources, and livestock grazing resources be from the continuation and expansion of mining activities?</p>	<p>Impact Analysis</p>
	<p>What would the cumulative impact of mine expansion and development onto private lands be to historical mine features, cultural resources, and traditional cultural properties?</p>	<p>Impact Analysis</p>
	<p>What would the cumulative impacts from the cumulative development of one of the alternatives along with expansion of mining activities onto state trust and private lands be to the Upper Burro Creek Wilderness?</p>	<p>Impact Analysis</p>
	<p>What would the cumulative impacts from the cumulative development of one of the alternatives along with expansion of mining activities onto state trust and private lands be to the aquatic and riparian habitats of Burro Creek?</p>	<p>Impact Analysis</p>
	<p>What would the cumulative impacts from the development of one of the alternatives along with expansion of mining activities onto state trust and private lands be to wildlife, including aquatic, riparian obligate and facultative wildlife species, and migratory birds that use the riparian and aquatic habitats of Burro Creek?</p>	<p>Impact Analysis</p>
	<p>What would the cumulative impacts be of increased water withdrawal from the expansion of mining activities onto state trust and private lands?</p>	<p>Impact Analysis</p>

Table 1.7-5. Scoping Issues that Are Out of Scope of the Current Proposals and Eliminated from Further Analysis

Resource Topic	Issue
Socioeconomics	How would water usage associated with the Proposed Actions impact socioeconomics, including the ranching industry, in the Wikieup area?
Health and Safety	How would the Proposed Actions affect health and safety in the Wikieup area related to fire and safety issues and ongoing water removal for mine operations from the Big Sandy area?
NEPA	How will the Proposed Actions and the NEPA analysis include expansion of the mine pit and operations?
Water Resources – Water Usage	How would the NEPA document address water usage at the Bagdad Mine and how it relates to removing water from the Big Sandy area and Wikieup? What would the effects of the Proposed Actions and Bagdad Mine operations be, as related to water usage, on water availability in the Wikieup area? What will be the source of water and the quantity of water needed for the Proposed Actions?
Water Resources – Potential Downstream Contamination	Might the project result in surface water runoff into Burro Creek and the Santa Maria basin, and would it affect the proposed Wild and Scenic River segments and associated resources? What would the impact be of mine contaminants breaching into Burro Creek and the Burro Creek Wilderness via the Butte Creek watershed? Is it likely that mine contaminants would drain into Burro Creek via Butte Creek? How uncertain is such an event? How often is a breach likely to happen, and how can it be mitigated? How controversial would the breach of contaminants into Burro Creek be?
Biological Resources	How will facilities, especially power lines, affect raptors? Would design include raptor-proof power lines? What would the impact be to other species of wildlife from providing new perch and nesting sites to raptors under the Proposed Actions and alternatives? How would the water quality of free-standing water and water impoundments affect wildlife, including bats, under the Proposed Actions and alternatives? How would a potential breach or contaminated drainage from the project area affect wildlife and habitat in Burro Creek? How would the Proposed Actions and alternatives affect the southwestern willow flycatcher and critical habitat; yellow-billed cuckoo and critical habitat; northern Mexican gartersnake and critical habitat; Yuma clapper rail, razorback sucker, bonytail chub, candidate Sonoran desert tortoise, lowland leopard frog, and other amphibians and reptiles in the Bill Williams watershed, including impacts to riparian habitat? How would the Proposed Actions and alternatives affect the zone-tailed hawk and black hawk in the area of Burro Creek and the Bill Williams watershed?

Regarding the biological resource-related issues identified in Table 1.7-5, the FMBI and APS Proposed Actions do not contain power line development. Therefore, analyzing the impact of new power lines and their potential to impact biological resources is out of scope of the analysis. In addition, the APS ROW has already been analyzed in another EA and granted; the existing conditions within that grant are not part of the analysis for the APS access roads. Similarly, neither the FMBI nor APS Proposed Actions contain provisions for development of surface water impoundments. Finally, the BLM initially considered a number of alternative locations to the stockpile extension that would have located the project area in the vicinity of, or having the potential to drain into, Boulder or Burro Creeks (and subsequently the Bill Williams watershed), but each was subsequently dismissed from detailed analysis for the reasons identified in Appendix B. The species or habitats identified in Table 1.7-5 as occurring within the Burro Creek and Bill Williams watersheds are well outside the analysis area that could potentially be affected by the Proposed Actions.

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Chapter 2

PROPOSED ACTIONS AND ALTERNATIVES

2.1 INTRODUCTION

Chapter 2 describes the respective FMBI and APS Proposed Actions (for FMBI, a stockpile extension, which would include two monitoring wells and access roads to these two well sites; for APS, power line access roads).

2.2 PROPOSED ACTIONS

2.2.1 Proposed Stockpile Extension

The FMBI Proposed Action would extend the existing Bagdad stockpile facility onto approximately 441 acres of BLM-managed land and 79 acres of FMBI-owned land in Sections 16 and 17, Township 14 North, Range 9 West (Figure 2.2-1). The southern boundary of the proposed stockpile extension would generally correspond to a drainage divide (ridgeline) between the Burro Creek Subbasin and the Santa Maria Subbasin (see Figure 2.2-1). Stockpiled materials would not be deposited south of this drainage divide. At full development, the stockpile extension would rise to approximately 1,200 feet above ground surface at its highest point (approximately 4,850 feet above mean sea level [amsl]).

Operation of the stockpile extension would involve a continuation of the practices and methods in use for the existing stockpile. Construction of the stockpile extension would generally consist of placement of mined materials in 50-foot vertical lifts and would comply with Mine Safety and Health Administration (MSHA) requirements. Safety berms would be constructed at the edge of each lift, and benches would be constructed for slope stability and to catch potential rockfall. The stockpile would continue to be monitored for compliance with the Aquifer Protection Permit (APP), including monitoring for stability. Waste rock would be placed in such a manner that it would not require major reshaping in the future to meet reclamation standards.

The stockpile extension would continue to be accessed by mine haul trucks delivering rock from the open pit. Access roads would be built into the lifts and would meet MSHA standards. In addition to haul trucks, equipment used in stockpile operations would continue to include dozers, graders, and water trucks for dust suppression.

Mineralized waste rock and unmineralized waste rock (overburden) from the open pit would continue to be placed on the stockpile by haul trucks. Leaching would occur on the Plan IX Leach (western) portion of the stockpile, with overburden and mineralized waste rock stored on the South Waste Rock (eastern) portion of the stockpile (see Figure 2.2-1). The majority of the proposed extension would be leached, meaning that a dilute sulfuric acid solution would be applied to the surface of the mineralized waste rock. The leach solution would percolate downward through the stockpiled materials and dissolve soluble minerals. The mineralized solution (known as pregnant leach solution [PLS]) would then flow to leach collection facilities on FMBI private land (Kimberly Pond and the Alum PLS Sump).

The final design, construction, and configuration of the extended stockpile may vary in order to accommodate adjustments or refinements to the engineering design as well as other factors, including slope stability, safety, access, water management, or other construction, operational, closure or post-

closure needs. The MPO Modification identifies the proposed limit of the stockpile extension as the anticipated maximum area of ground disturbance. This upper limit on the size of the stockpile facility allows for a degree of flexibility in planning to meet future needs based on a changing economic environment. This approach also avoids the potential for additional plan modifications/amendments and required approvals, and is consistent with Sections 4.3.3.2.2 and 4.4.3.2 of the BLM Surface Management Handbook (H-3809-1 [BLM 2012]).

Following active mining operations, the proposed stockpile extension would be closed and reclaimed in accordance with the reclamation plan provided in the MPO Modification. Using mine planning and economic modeling assumptions (which are subject to change based on market conditions), closure and reclamation would be anticipated to begin around 2050. The reclamation and closure plan was prepared pursuant to the regulatory requirements of BLM, the APP administered by the Arizona Department of Environmental Quality (ADEQ), and the Arizona State Mine Inspector (ASMI). The objectives of the reclamation and closure plan are to promote viable post-mining land use, reduce impacts to surface water and groundwater, and promote post-mining public safety.

Reclamation activities on the stockpile extension would include strategic regrading and contouring of the facility to control and divert surface water runoff from the stockpile in order to minimize erosion and infiltration. In addition, flat top surfaces and benches would be covered with a material that limits erosion and has water-holding capacity to support vegetative growth (e.g., Gila conglomerate). These surfaces would be revegetated to promote the rangeland post-mining land use (FMBI 2014).

Two monitoring wells and the accompanying access roads are proposed as shown in Figure 2.2-2.¹

Each monitoring well pad drill site would require an area measuring approximately 125 × 75 feet. Access roads would be approximately 500 feet long × 25 feet wide (i.e., an approximately 19-foot travel lane with 3-foot berms on either side). Well pad and access road construction would take approximately 5 days; construction equipment would include a dozer, grader, and backhoe.

The length of time to drill each well would vary and would take approximately 5 to 15 days, depending on well depth. Wells would be less than 2,000 feet deep. Upon completion of drilling, an approximately 3 × 3-foot concrete slab would be constructed around the base of the well surface casing, which would typically be 6 inches in diameter × 2 feet high. The well cap would be locked and labeled with the Arizona Department of Water Resources (ADWR) well number. Construction disturbance areas around the wells would be revegetated using a BLM-approved native seed mix and/or plants salvaged from access road disturbed areas. The access roads to the well pads would remain open.

Applicant-Committed Environmental Protection Measures

FMBI commits to the following design features, as part of the Proposed Action, to minimize environmental effects during construction, operation, and reclamation of the proposed stockpile extension project.

¹ The distributed facilities in the Proposed Action presented during public scoping have been modified. See the *Bagdad Mine Stockpile Extension Project Scoping Report* (available at: <http://bit.ly/bagdadMPO>) for further information.

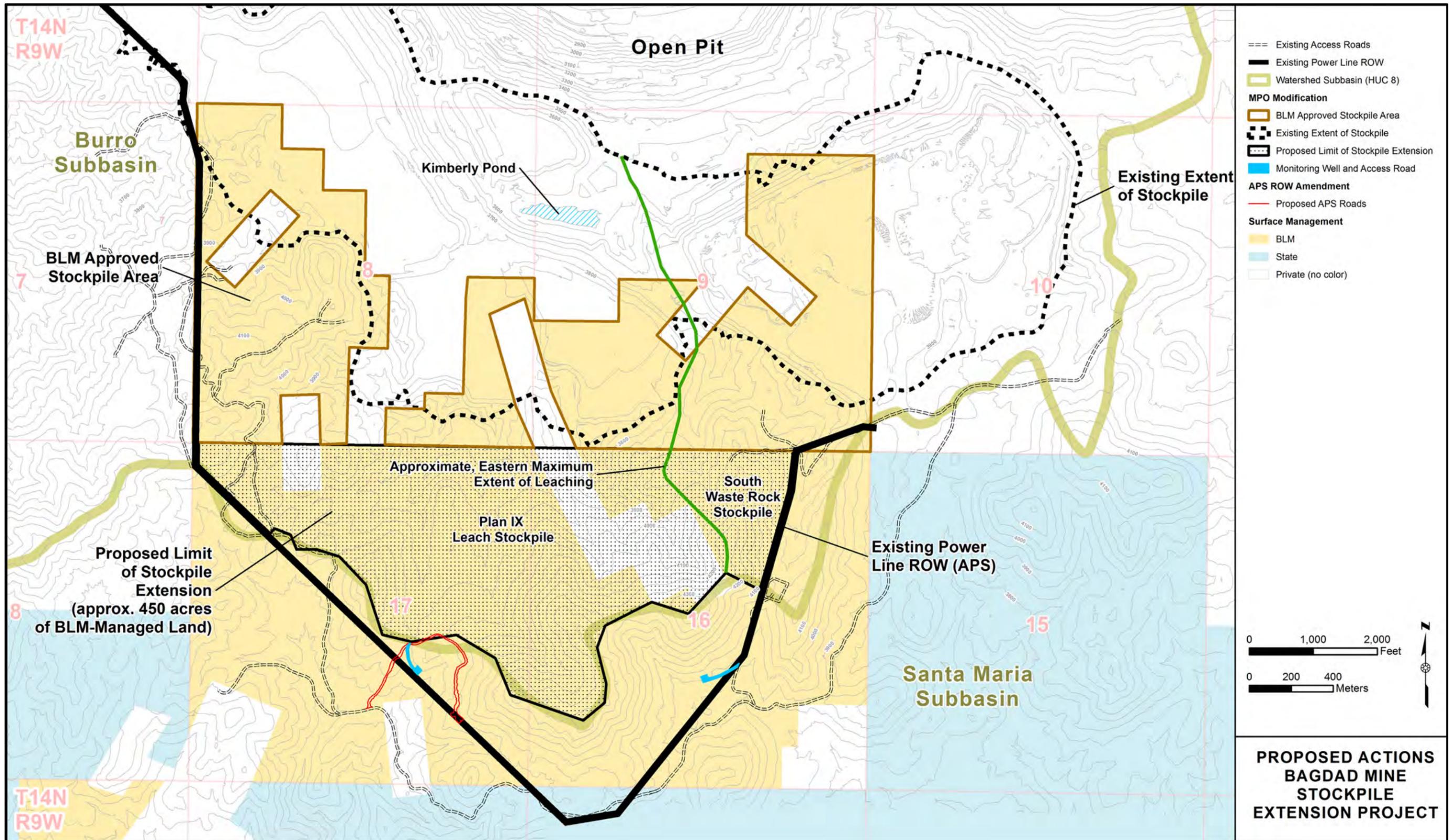


Figure 2.2-1. FMBI proposed stockpile extension area.

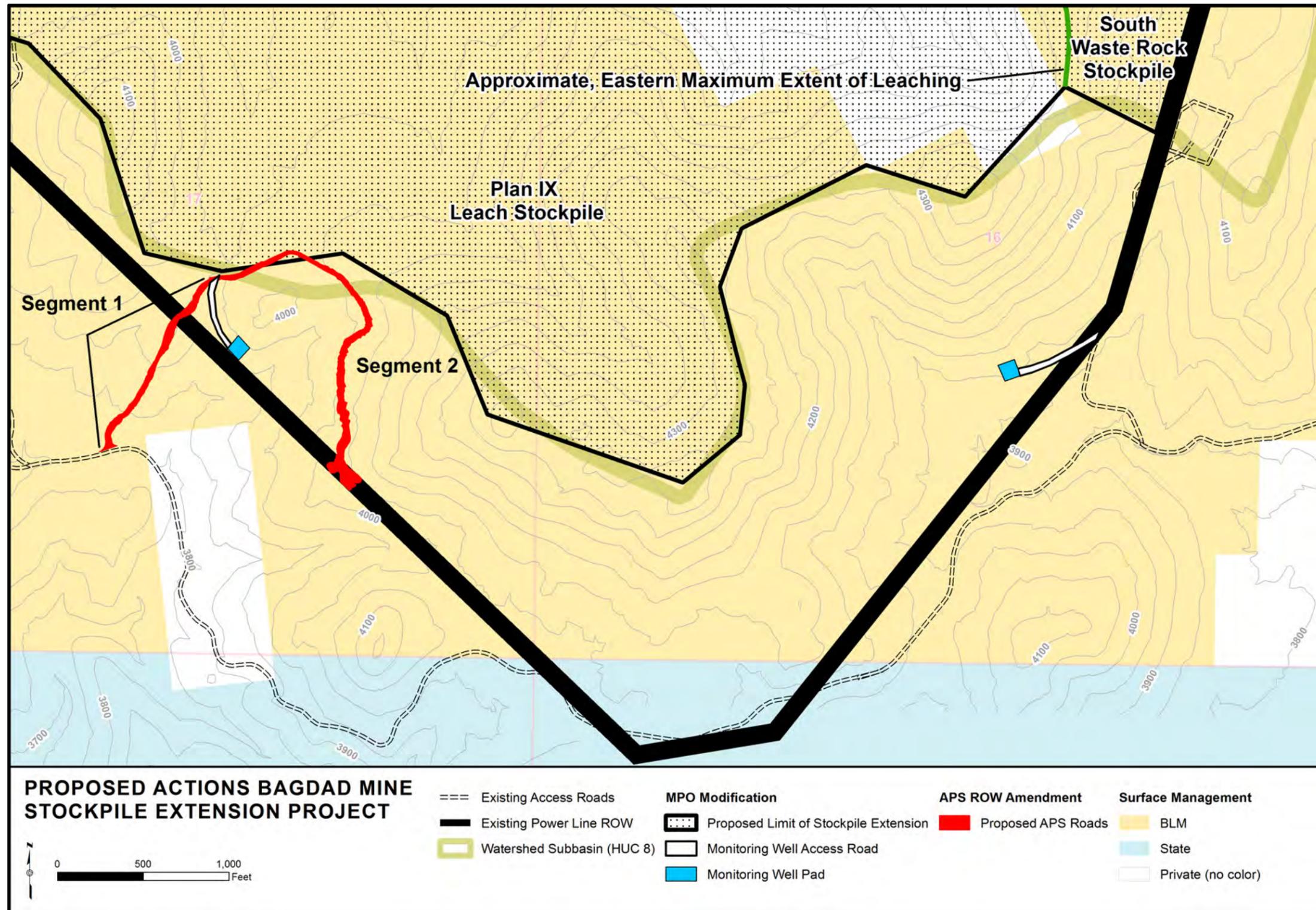


Figure 2.2-2. FMBI proposed monitoring wells and associated access roads and APS proposed access roads.

FMBI commits to compliance with the following:

- current Bagdad Mine Air Quality Permit to protect air resources;
- current or updated Bagdad Mine Arizona Pollutant Discharge Elimination System (AZPDES) and Stormwater Pollution Prevention Plan (SWPPP) to protect surface water resources, where applicable;
- current or updated ADEQ APP to protect groundwater resources;
- Sonoran desert tortoise handling protocols;
- compensation for loss of desert tortoise habitat as prescribed in BLM Instruction Memorandum (IM) No. AZ-2012-031;
- treatment of affected cultural resources consistent with a Historic Properties Treatment Plan (HPTP); and
- Bagdad Mine reclamation plans as described in the MPO and posted on the BLM project website.

In addition, FMBI would avoid disturbance to the grazing infrastructure and stock tank/well located just within the proposed limit of stockpile extension southern boundary (see Section 3.5, Water Resources, and Section 3.13, Land Use/Grazing, in Chapter 3 for more information).

The Chapter 3 resource analysis sections contain information on the application of these environmental protection measures. These sections also include any BLM-recommended mitigation measures (if applicable). Mitigation measures related to the stockpile extension listed in this document have been agreed to by FMBI and will be incorporated into the MPO Modification.

2.2.2 Proposed Power Line Access Roads

The APS Proposed Action would amend the existing ROW to allow construction of new and improvement of existing access roads necessary for future maintenance of the 115-kV power line. These roads would be outside the 100-foot ROW within which ground-disturbing activities on BLM-managed public lands are authorized (see Figure 2.2-2). A draft of this proposed ROW amendment is provided in Appendix C.

Should BLM approve the APS Proposed Action without modification, the company would construct or improve approximately 0.6 mile of access roads, totaling approximately 1.4 acres of surface disturbance.² The roads would consist of two segments, as follows (see Figure 2.2-2):

- Segment 1—improvement of approximately 1,175 feet (0.2 mile) of existing road; and
- Segment 2—construction of approximately 2,120 feet (0.4 mile) of new access road.

APS is requesting a preliminary 80-foot ROW for each of the segments for construction in consideration of terrain obstacles and known cultural resources in these areas. Actual road widths would consist of an approximately 14-foot-wide travel lane with approximately 2-foot-wide berms/shoulders to either side, for a total road width of approximately 18 feet. Upon completion of the roads, APS would submit “as built” design plans for BLM consideration in determining the final width of the ROW amendment.

² The Proposed Actions presented during public scoping have been modified. See the *Bagdad Mine Stockpile Extension Project Scoping Report* (available at: <http://bit.ly/bagdadMPO>) for further information.

It is anticipated that access road construction would take approximately 3 weeks to complete. Construction equipment would include a dozer, grader, and backhoe. Cut-and-fill areas or other surface disturbances outside the requested 18-foot-wide access road segments would be revegetated using a BLM-approved native seed mix and/or plants salvaged from the areas disturbed by the access road construction.

Applicant-Committed Environmental Protection Measures

As part of the Proposed Action, APS commits to the environmental protection measures included in the Plan of Development (POD) for the power line ROW (BLM 2009c) and the additional terms and conditions for the APS road construction project. This includes, but is not limited to, the following:

- vehicle movement will be restricted to designated areas;
- construction limits will be predefined and confined to those limits;
- where possible, vegetation will be avoided to avoid excessive root damage and to allow resprouting;
- construction personnel will be instructed on the protection of ecological resources;
- hazardous materials and trash will be contained; and
- during construction, monitoring will be conducted for special status species.

APS would also comply with Sections 402 and 404 of the CWA and AZPDES and SWPPP permitting regulations to protect surface water resources.

The Chapter 3 resource analysis sections contain information on the application of these environmental protection measures. These sections also include any BLM-recommended mitigation measures (if applicable).

2.3 NO ACTION ALTERNATIVES

2.3.1 FMBI Stockpile Extension

Under the No Action Alternative for the FMBI Proposed Action, the MPO Modification would not be approved. There would be no extension of the current stockpile onto public lands in Sections 16 and 17 and no development of monitoring wells and associated access roads within these areas (see Figure 2.2-1). However, under this alternative, FMBI would continue to operate on BLM-managed lands under the approved 1996 MPO (Cyprus 1996).

Through the FLPMA, Congress specifically empowers the Secretary of the Interior—and by extension the BLM Field Manager—the authority to deny approval of any proposed mining activity for locatable minerals on public lands if it is determined the proposed activity would not comply with BLM 3809 surface management regulations and the FLPMA mandate to prevent unnecessary or undue degradation (43 USC 1732(b); 43 CFR 3809.5) (see also Chapter 1, Section 1.4, Decisions to Be Made). Thus, in order for BLM to select the No Action Alternative for the FMBI Proposed Action, BLM would have to demonstrate that undue and unnecessary degradation would result from approval of the MPO Modification as submitted.

If the No Action Alternative is selected, future extension of the stockpile could occur on lands privately held by FMBI. The manner in which those lands would be developed is not known, and any attempt to estimate it (or analyze the impacts of it in this EA) would be speculative at best. In addition, it is outside the BLM's authority to direct the company how to use their private lands.

2.3.2 APS Access Roads

Under the No Action Alternative for the APS Proposed Action, BLM would not approve the ROW amendment granting the company the right to construct additional power line access roads outside the ROW. If the No Action Alternative for the APS Proposed Action is selected, APS would need to use the approved ROW, subject to the grant terms and conditions, to achieve the required access.

2.4 PROPOSED ACTIONS CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

2.4.1 Alternate Stockpile Extension Locations

Since this project is a modification of the surface disturbance associated with approved facilities under the existing 1996 MPO (Cyprus 1996), no other alternatives need to be considered.

However, in order to be responsive to public scoping comments and to demonstrate that FMBI has the physical capacity to stockpile waste rock material, and is not dependent on the approval of the proposed stockpile extension to continue mining, BLM and FMBI considered additional potential locations for the stockpile on both private and public lands.

BLM reviewed four potential alternative stockpile locations on BLM-managed lands and seven potential alternative stockpile locations on FMBI-owned land in the vicinity of the Bagdad Mine. Following the evaluation, it was determined that:

- FMBI has the physical capacity to stockpile waste rock material.
- The alternate stockpile locations either did not meet the purpose and need, were not practical and technically feasible, and/or were not environmentally reasonable (i.e., would likely result in adverse environmental impacts greater than those of the FMBI Proposed Action).

The screening criteria used in this evaluation, a map showing the approximate locations of other potential sites, and the results of the evaluation conducted for each location are provided in Appendix B.

2.4.2 Additional APS Access Roads

APS' original Plan of Development (POD) as submitted to the BLM in April 2009 envisioned a maximum of approximately 20 access road spurs and/or segments outside the existing, approved 100-foot-wide transmission line ROW, having a total length of approximately 1.6 miles of surface disturbance on BLM lands. However, in January 2015 APS amended its application regarding the Bagdad 115kV transmission line ROW and reduced its request for approval of access roads outside the ROW to three segments only, totaling 0.7 mile. This was done in response to finding that adequate access to all but three power line tower structures (Nos. 20, 21, and 22) could be accomplished through road construction within the approved 100-foot-wide ROW.

In April 2016, in response to tribal concerns, APS further reduced its request to BLM for approval of access roads outside the ROW to two segments totaling 0.6 mile: Segments 1 and 2 as shown in Figure 2.2-2. The previously requested Segment 3 has therefore been eliminated from detailed analysis in this EA.

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Chapter 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

The purpose of this chapter is to describe existing resources and human uses in and around the Bagdad Mine stockpile extension project area (including the proposed APS access road areas) that may be affected by the Proposed Actions, and the direct, indirect, and cumulative environmental effects that are reasonably expected to occur as a result of implementation of these actions. Resources and uses considered include the following:

- Air Resources (Section 3.4)
- Water Resources (Section 3.5)
- Geology and Soil Resources (Section 3.6)
- Vegetation Resources (Section 3.7)
- Wildlife Resources (Section 3.8)
- Cultural Resources (Section 3.9)
- Recreation Resources/Public Access (Section 3.10)
- Visual Resources (Section 3.11)
- Noise (Section 3.12)
- Land Use/Grazing (Section 3.13)

The sections that follow this introduction contain information characterizing the existing conditions, followed by a discussion of the anticipated environmental consequences. Impacts are defined as modifications to the existing condition of the environment and/or probable future conditions that would be brought about by the proposed undertakings. Impacts can be beneficial (positive) or adverse (negative) and can result from a project directly, indirectly, or cumulatively. Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time frame.

Using the information regarding the existing environmental conditions and the description of the Proposed Actions (see Chapter 2), the types and magnitudes of impacts anticipated to occur from each alternative were identified and quantified to the extent practicable.

Following the resource impact section, the impacts of the FMBI and APS No Action Alternatives are presented below in Section 3.14, Effects of the No Action Alternatives.

3.1.1 Supplemental Authorities

Supplemental authorities are those subject to requirements as specified by statute or executive order (EO) and must be considered in all BLM environmental documents. The elements associated with the supplemental authorities identified in the BLM NEPA Handbook (BLM 2008:Appendix 1) are listed in Table 3.1-1. The table lists the specific element, a determination of whether the element is present in the element's analysis area, and a determination of whether the Proposed Actions would affect that element.

Table 3.1-1. Supplemental Authority Elements and Rationale for Detailed Analysis for the Proposed Action

Supplemental Authority Element	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale/Reference Section
Air Resources			X	See Section 3.4.
Areas of Critical Environmental Concern	X			This element is not present within the project area or vicinity and is not further analyzed in this EA.
Cultural Resources			X	See Section 3.9.
Environmental Justice	X			No minority or low-income groups would be disproportionately affected by health or environmental effects as a result of the Proposed Actions. This element is not present in the project area or vicinity, and is not further analyzed in this EA.
Farm Lands (Prime or Unique)	X			This element is not present within the project area or vicinity and is not further analyzed in this EA.
Fish Habitat	X			Fish habitat is not present within the project area or vicinity and is not further analyzed in this EA.
Floodplains	X			This element is not present within the project area or vicinity and is not further analyzed in this EA.
Forests and Rangelands (Healthy Forests Restoration Act [HFRA] projects only)	X			This project does not meet the requirements of an HFRA project and is not further analyzed in this EA.
Historic Trails	X			No designated historic trails are present within the project area or vicinity; this resource is not further analyzed in this EA.
Human Health and Safety	X			FMBI is, by law, required to comply with all applicable MSHA safety requirements. In addition, the company conducts regular safety training for all employees and visitors to the mine. The stockpile extension area would be secured from public access by fencing and locked gates, and thus would not represent a threat to public health and safety.
Migratory Birds			X	See Section 3.8.
Native American Religious Concerns			X	See Section 3.9.
Noxious Weeds, Invasive and Non-native Species			X	See Section 3.7.
Threatened or Endangered Species			X	See Sections 3.7 and 3.8.
Wastes—Hazardous/Solid		X		Activities associated with the Proposed Actions would not require the use, storage, or transport of hazardous materials beyond what was analyzed in the 1996 FEIS (BLM 1996a). No further analysis for this element is included in this EA.
Water Quality (Surface and Ground)			X	See Section 3.5.
Wetlands and Riparian Zones			X	See Section 3.5.
Wild and Scenic Rivers	X			This element is not present within the project area or vicinity and is not further analyzed in this EA.
Wilderness/Wilderness Study Areas/Lands with Wilderness Characteristics			X	See Section 3.10.

Those elements listed under the supplemental authorities that either are not present in the project area (therefore not affected), or are present but not affected by the FMBI and APS Proposed Actions are not discussed further in this EA based on the rationale provided in Table 3.1-1 above. Elements present in the project area that may be affected by the Proposed Actions are analyzed in detail in sections 3.4 through 3.13 of this chapter.

3.1.2 Additional Resources Considered for Analysis

In addition to the elements listed under supplemental authorities above, the BLM considers other resources and uses occurring on public lands, along with the issues that may result from the implementation of the FMBI and APS Proposed Actions. Table 3.1-2 lists other resources or uses of the human environment considered in this EA.

Table 3.1-2. Additional Resources Considered Not Associated with Supplemental Authorities

Other Resource or Use	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale/Reference Section
Geology and Mineral Resources			X	See Section 3.6.
Land Use Authorizations			X	See Section 3.13.
Paleontological Resources	X			This resource is not present within the project area or vicinity and is not further analyzed in this EA.
Rangeland Management (Grazing)			X	See Section 3.13.
Recreation (and Public Access)			X	See Section 3.10.
Social Values and Economics (Socioeconomics)		X		The proposed actions detailed in the FMBI MPO modification would result neither in increased or decreased employment at the Bagdad mine, nor result in any increase or decrease in mine production rates, and thus would have no discernable effect on socioeconomic values.
Soils			X	See Section 3.6.
Special Status Species—Plants and Wildlife			X	See Sections 3.7 and 3.8.
Vegetation			X	See Section 3.7.
Visual Resources			X	See Section 3.11.
Wild Horse and Burros	X			These resources are not present within the project area or vicinity; this is not further analyzed in this EA.
Wildlife			X	See Section 3.8.

Those other resources listed that do not occur in the project area and would not be affected by the FMBI and APS Proposed Actions are not discussed further in this EA based on the rationale provided in Table 3.1-2 above.

3.2 METHODOLOGY

The geographic extent used for the impact analysis varies by resource. Each affected resource analyzed in this EA defines an “analysis area” based upon the extent for potential direct and indirect impacts from the Proposed Actions on that particular resource. As a result, each resource may use a different “analysis area” for impact assessment.

Resource impact analyses conducted for this EA used the following methodology to describe the effects (direct, indirect, and cumulative) of the FMBI and APS Proposed Actions on the human environment. Table 3.2-1 defines direct and indirect effects (i.e., impacts). Cumulative impacts are discussed in the following section (Section 3.3).

Intensity refers to the severity or level of magnitude of impact. This EA uses the terms major, moderate, or minor/negligible in describing the intensity of effects (see Table 3.2-1).

Context means that the effect(s) of an action must be analyzed within a framework or within physical or conceptual limits. Resource disciplines, location, type, or size of area affected (e.g., local, regional, national), and affected interests are all elements of context that ultimately determine impacts. For this EA, both short- and long-term impacts are relevant (see Table 3.2-1).

The following categories of magnitude and duration are presented to define relative levels of effects and to provide a common language when describing effects.

Table 3.2-1. Standard Definitions of Impact and Resource Impact Descriptions for Magnitude and Duration

Description Relative to Resource	
Impact	
Direct	Effects that are spatially and temporally immediate to the Proposed Actions.
Indirect	Reasonably foreseeable effects that are removed in space and/or time from the Proposed Actions.
Magnitude	
No Impact	Would not produce obvious changes in baseline condition of the resource.
Minor/ Negligible	Impacts would occur, but resource would retain existing character and overall baseline conditions.
Moderate	Impacts would occur, but resource would partially retain existing character. Some baseline conditions would remain unchanged.
Major	Impacts would occur that would create a high degree of change within the existing resource character and overall condition of resource.
Duration	
Short term	During construction and up to 5 years (from when ground-disturbing activities begin, through reclamation when vegetation has been reestablished in construction areas).
Long term	More than 5 years; life of the project.

3.3 CUMULATIVE IMPACTS ANALYSIS

Cumulative impacts are the sum of all past, present, and reasonably foreseeable future projects, regardless of what agency (federal or non-federal) or person undertakes such other actions. Additionally, cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). The purpose of this analysis is to evaluate identified cumulative impacts on environmental resources that may result from the implementation of the FMBI and APS Proposed Actions in addition to past actions, present actions, and reasonably foreseeable future projects. These impacts are assessed within a designated analysis area for each resource. The extent of the analysis area for cumulative impacts varies for each resource and is based on the geographic or biological limits of that resource. The length of time for cumulative impacts analysis may also vary, according to the duration of impacts from the FMBI and APS Proposed Actions on a particular resource.

Past and present actions are those actions contributing to the current condition of the resources found within the project area. Past and present actions that have contributed to the current condition of resources include activities such as livestock grazing and dispersed recreational use of public lands. In addition to grazing and recreation, past and present actions include:

- BLM activities such as monitoring; wildlife surveys; vegetative and wildlife habitat improvement projects; invasive, non-native species control efforts; fire management activities;
- Construction of the APS power line;
- Public forms of multiple-use (gaining access to/from private or public lands) across BLM lands;
- Maintenance forms of multiple-use (utility companies maintaining power lines on ROWs, lands/realty surveys, etc.);
- Mineral exploration, extraction, and/or development (including the past and present operations of the Bagdad Mine).

Reasonably foreseeable future projects are those for which there are existing decisions, formal proposals, or are highly probable, based on known opportunities or trends. The BLM has identified no additional reasonably foreseeable future projects, aside from the Proposed Actions, that would be occurring within the analysis areas for cumulative impacts.

3.3.1 Cumulative Impacts Analysis Area

The geographic extent of a cumulative impact analysis area varies by the type of resource and impact. Cumulative impacts analysis areas are described for each resource in this EA, including rationale for the defining of each geographic boundary as it pertains to a particular resource. The time frame, or temporal boundary, for those impacts is defined by each respective Proposed Action and is consistent for all resources analyzed in this EA. For the proposed stockpile extension, the temporal boundary for cumulative impacts is considered to be 50 years, the remaining life of the mine. For the proposed access roads, the temporal boundary for cumulative impacts is considered to be 2 to 3 years. Although the replanting of disturbed soils may successfully establish vegetation in some locations, the success of project area rehabilitation is dependent on many factors, including rainfall, seed mix, and appropriate seedbed preparation. Therefore, the 2- to 3-year temporal boundary accounts for the time needed for construction, and allows 1 to 2 years after construction for vegetative cover regrowth within the project area.

3.4 AIR RESOURCES

3.4.1 Resource Issues and Indicators for Analysis

Air quality and climate are components of air resources that may be affected by the FMBI and APS Proposed Actions. During the scoping phase, four issues related to air quality (see Table 1.7-4) were identified for further analysis. These items appear below, modified for clarity:

- How would the Proposed Actions impact air quality?
- How are emissions from the Proposed Actions regulated?
- How would air quality (particularly emission levels of particulate matter 10 [PM₁₀] and CAA compliance) be impacted by the stockpile extension?
- What are the required BMPs for reducing impacts to air quality?

The first and third resource issues will be addressed in Section 3.4.3, Environmental Consequences, by examining the expected emissions from construction and operation of the Proposed Actions. The second issue will be addressed in Section 3.4.2, Affected Environment, describing the regulatory background for air quality. The fourth issue is addressed in Environmental Consequences, Mitigation Measures.

3.4.2 Affected Environment

The affected environment includes two distinct parts: 1) the regulatory environment, which includes the regulations affecting the proposed actions; and 2) the physical environment, which is the actual state of air quality in the area. The affected environment is analyzed within a designated analysis area, extending 1 mile beyond the site of the Proposed Actions. A 1-mile analysis area around the site of the FMBI and APS Proposed Actions was chosen due to the expected temporary nature of emissions from these actions. The analysis area is entirely within Yavapai County in Arizona.

The analysis area is mountainous, ranging in elevation from 2,000 to 5,000 feet amsl. Hot temperatures are common throughout the summer, especially lower elevations, with temperatures occasionally reaching over 115 degrees Fahrenheit (°F). Day-night temperatures can vary by as much as 60 degrees during the drier months of the year. During winter months, daytime temperatures may average 70°F, with night temperatures falling to slightly above freezing. While the region is generally recognized as semiarid, precipitation varies greatly by season (average 0.27 inch in June to 1.96 inches in February) (Telesto Solutions, Inc. [Telesto] 2015a). Typically, winter storms may occur from November through March, and summer storms occur from July to mid-September (Western Regional Climate Center 2015).

Air Quality

AMBIENT AIR QUALITY STANDARDS

The CAA requires the U.S. Environmental Protection Agency (EPA) to establish air quality standards for pollutants considered harmful to public health and the environment. National Ambient Air Quality Standards (NAAQS) were established for the six most common air pollutants – ozone (O₃), carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead (Pb). There are primary and secondary NAAQS. Primary standards set limits that are protective of human health, and secondary standards set limits that protect the public welfare. Pollutants with acute health effects were assigned short-term standards, and those with chronic health effects were assigned

long-term standards. Since the NAAQS were first established, they have undergone revisions by the EPA to ensure the most up-to-date and protective standards achievable.

AIR QUALITY PERMITTING PROGRAM

The ADEQ administers the air quality permitting program for the parts of Arizona surrounding the Proposed Actions. The permitting program is the primary mechanism for regulating emissions from stationary sources, including the Bagdad Mine (Permit No. 60433). The mine is regulated as a Class II synthetic source. The air quality permit states that the Bagdad Mine has the potential to emit more than 100 tons per year of particulate matter with an aerodynamic diameter of less than 10 microns (PM₁₀), and that the mine will operate air pollution controls and accept voluntary emissions limitations to stay below the major source threshold. Permit conditions as well as the MPO affecting the Proposed Action require the operators of the Bagdad Mine to keep dust and other particulates to a minimum by employing dust suppressants, temporary paving, detouring, wetting down, or by other reasonable means when a roadway is repaired, constructed, or reconstructed. Also, dust from non-point fugitive sources (such as roads) is required to be less than a 40% opacity limit.

EXISTING AIR QUALITY

In accordance with the CAA, the EPA must review air quality conditions reported by states to determine whether states are meeting the NAAQS. Areas meeting the NAAQS are deemed to be “attainment” areas; conversely, those that do not meet the standards are referred to as “non-attainment” areas. Areas that cannot be classified on the basis of insufficient data are designated as “unclassifiable.” The designation “attainment/unclassifiable” may be assigned to areas that are lacking sufficient monitoring data but meet the standard or will soon meet the standard. The EPA designates Yavapai County as being in attainment/unclassifiable with respect to the NAAQS for O₃, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and Pb (EPA 2014).

COUNTY-WIDE EMISSIONS INVENTORY

Emission inventories are useful in comparing emission source categories to determine which industries or practices are contributing to the general level of pollution in an area. Emission inventories provide an overview of the type and amount of pollution emitted on an annual basis from sources in the area. For the purposes of this assessment, the most recent National Emissions Inventory data (EPA 2011) for Yavapai County are summarized in Table 3.4-1, including hazardous air pollutants (HAPs) and nitrogen oxides (NO_x).

According to the EPA (2011) National Emissions Inventory, the most abundant pollutants emitted in Yavapai County are volatile organic compounds (VOCs) and CO. Biogenics account for 95% of VOC emissions. The major sources contributing to CO emissions are mobile sources and biogenics, accounting for 89% of total CO emissions. Particulate (PM₁₀ and PM_{2.5}) emissions are principally generated from dust and industrial processes.

Table 3.4-1. Emissions Inventory in Tons per Year

Source	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	HAPs
Yavapai County, Arizona							
Agriculture	0	0	69	14	0	0	0
Biogenics*	26,449	655	0	0	0	148,715	25,678
Dust	0	0	13,620	1,559	0	0	0
Fires	4,222	103	470	398	46	1,009	139
Fuel Combustion	1,841	217	264	262	9	324	53

Table 3.4-1. Emissions Inventory in Tons per Year (Continued)

Source	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	HAPs
Industrial Processes	402	1,827	5,863	849	1,995	25	32
Miscellaneous [†]	30	1	78	72	0	2,415	434
Mobile	41,927	10,240	524	372	52	4,180	1,068
Waste Disposal	1,781	65	283	237	4	147	29
Subtotal	76,652	13,108	21,171	3,763	2,106	156,815	27,433

Source: EPA (2011).

Note: Due to an incomplete data set, greenhouse gas emissions are not presented.

* Biogenic emissions are those emissions derived from natural processes (such as vegetation and soil).

† Miscellaneous categories include bulk gasoline terminals, commercial cooking, gas stations, miscellaneous non-industrial (not elsewhere classified), and solvent use.

Climate Change

The 2013 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report states that the atmospheric concentrations of well-mixed, long-lived greenhouse gases (GHGs), including carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), have increased to levels unprecedented in at least the past 800,000 years. Further, human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes. It is extremely likely (95%–100% probability) that human influence has been the dominant cause of the observed warming since the mid-twentieth century (IPCC 2013).

Global mean surface temperatures have already increased 1.5°F (from 1880 to 2012). Additional near-term warming is inevitable due to the thermal inertia of the oceans and ongoing GHG emissions. However, climate change will impact regions differently, and warming will not be equally distributed. Both observations and computer model predictions indicate that increases in temperature are likely to be greater at higher latitudes, where the temperature increase may be more than double the global average. Models also predict increases in duration, intensity, and extent of extreme weather events. Warming of surface air temperature over land will very likely be greater than over oceans (IPCC 2013).

GHG emissions are quantified in carbon dioxide equivalent (CO₂e). CO₂e is calculated using an EPA-defined formula that assigns a global warming potential (GWP) to GHGs. The GWP has been calculated to reflect how long a GHG compound remains in the atmosphere, on average, and how strongly it absorbs energy. Gases with a higher GWP absorb more energy per pound than gases with a lower GWP, contributing more to warming. For example, CH₄ (methane) has a GWP of 25, so 1 ton of CH₄ emissions is equal to 25 tons CO₂e. This method allows all GHG compounds to be considered (40 CFR 98).

No national standards have been established regarding GHGs. In addition, the tools necessary to quantify incremental climatic impacts of specific projects or activities are presently unavailable. However, CEQ draft guidance states that NEPA documents for proposed federal actions resulting in direct GHG emissions of 25,000 metric tons per year should include a GHG emissions analysis of alternatives. The reference point of 25,000 metric tons of direct GHG emissions is not an indicator of a level of GHG emissions that may significantly affect the quality of the human environment, but serves as a minimum for conducting a quantitative analysis (CEQ 2014).

Climate change is a global phenomenon, the analyses of which consist of several factors, including GHGs, land use management practices, and the albedo effect (reflectivity). The tools necessary to quantify incremental climatic impacts of specific activities factors are presently unavailable. As a

consequence, impact assessment of effects of the Proposed Actions on a global or even regional level cannot be performed.

3.4.3 Environmental Consequences

Emissions of air pollutants would occur during construction and operation of both Proposed Actions. For both the FMBI and APS Proposed Actions, impacts from construction activities would be minor and short term. During the operational phase, impacts from routine inspections and maintenance would be minor and long term. Climate change impacts are discussed for both Proposed Actions together. While expected emissions would not change from current operations, some of these emissions would be emitted farther south within the footprint of the stockpile extension.

Proposed Bagdad Mine Stockpile Extension

Construction activities that have the potential to release regulated pollutants include:

- Dust emissions (PM₁₀ and PM_{2.5}) from general construction activity, regrading, and contouring of each monitoring well pad drill site and access roads;
- Tailpipe emissions from monitoring well pad drill site and access road construction equipment (a dozer, grader, and backhoe) for approximately 5 days; and
- Tailpipe emissions from well drilling equipment for a maximum of 15 days.

Emissions from construction activities have been estimated from the proposed Bagdad Mine stockpile extension and are detailed in Table 3.4-2. Equipment tailpipe emissions include emissions from the dozer, grader, backhoe, and well drilling equipment and are based on South Coast Air Quality Management District (SCAQMD) off-road equipment emission factors (SCAQMD 2007a). Dust emissions are based on the total area and duration of construction using Western Regional Air Partnership (WRAP) fugitive dust emission factors for construction (WRAP 2006).

Table 3.4-2. Estimated Construction Emissions from the FMBI Proposed Action, in Tons per Year

Activity	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	HAPs	GHGs*
Equipment tailpipe emissions	0.13	0.18	0.01	0.01	< 0.01	0.02	< 0.01	32
Dust emissions	–	–	0.01	< 0.01	–	–	–	–
Total	0.13	0.18	0.02	0.01	< 0.01	0.02	< 0.01	32

* GHGs = Greenhouse gases (including carbon dioxide, methane, and nitrous oxide). GHGs are reported in metric tons.

Construction activities that have the potential to release regulated pollutants include the following:

- Road dust emissions and tailpipe emissions from occasional travel along the road for well water sampling (up to several times per year); and
- Additional wind-blown dust erosion emissions from the stockpiles (these emissions are proportional to the surface area of the stockpiles, which will increase as a result of the FMBI Proposed Action).

The greatest contributors to these pollutants are construction equipment exhaust, construction worker commuting and material delivery, and fugitive dust emissions from general construction and earthmoving. The total mass of each pollutant is equal to or less than 0.01% of the counties' emission inventories for 2011.

Emissions from operational activities have been estimated from the FMBI Proposed Action and are detailed in Table 3.4-3. Emissions from wind erosion of the stockpile have been estimated according to EPA AP-42 emission factors based on an active stockpile area of 0.1 acre (the majority of the proposed extension will be leached, which will reduce erosion) (EPA 1998). Inspection activities are based on SCAQMD emission factors for on-road vehicles and EPA AP-42 emission factors for unpaved roads (EPA 2006; SCAQMD 2007b).

Table 3.4-3. Estimated Operational Emissions from the FMBI Proposed Action, in Tons per Year

Activity	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	HAPs	GHGs
Stockpile erosion	–	–	2.27	0.23	–	–	–	–
Inspection activities	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 1
Total	< 0.01	< 0.01	2.27	0.23	< 0.01	< 0.01	< 0.01	< 1

Emissions associated with development and operation of the proposed stockpile extension would be minor and long term. Emissions from the proposed monitoring wells and associated access roads would be minor and short term, lasting primarily for the duration of construction. The greatest contributors to these pollutants are fugitive dust emissions due to stockpile erosion and tailpipe emissions due to inspection activities. The total mass of each pollutant is equal to or less than 0.01% of the counties' emission inventories for 2011. It is expected that air resources would retain the existing character and overall baseline conditions.

Emissions from the stockpiling activities (trucks making deliveries to the stockpiles, bulldozers moving material, etc.) are not an impact associated with the Proposed Action and do not represent a change from the baseline condition. This is because mining-related activity associated with the stockpile is already ongoing, and the Proposed Action will not make any changes to the rate of mining or the rate of stockpile delivery. Receptors close to the Proposed Action areas (the residences to the southeast) may see an increase in wind-blown dust from the stockpile, as the extension will bring the stockpile closer to their property line. Importantly, operational emissions from the stockpile would still be required to follow the conditions of the mine's existing air quality permit.

Under the FMBI Proposed Action, there would be no direct or indirect impacts to climate. While there would be a small amount of GHGs produced, there would be no increase in GHG emissions in the analysis area, as mine operations and activities would remain at current levels.

Proposed 115-kV Power Line Access Roads

Construction activities that have the potential to release regulated pollutants include the following:

- Dust emissions (PM₁₀ and PM_{2.5}) from the construction of 3,295 feet (0.6 mile) of access roads, expected to take a total of approximately 3 weeks; and
- Tailpipe emissions from road construction equipment (a dozer, grader, and backhoe), for approximately 3 weeks.

Emissions from construction activities have been estimated from the Proposed Action and are detailed in Table 3.4-4. Equipment tailpipe emissions include emissions from the dozer, grader, and backhoe equipment and are based on SCAQMD (2007a) off-road equipment emission factors. Dust emissions are based on the total area and duration of construction using WRAP (2006) fugitive dust emission factors for construction.

Table 3.4-4. Estimated Construction Emissions from the Proposed APS Access Roads, in Tons per Year

Activity	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	HAPs	GHGs
Equipment tailpipe emissions	0.21	0.38	0.02	0.02	< 0.01	0.05	< 0.01	42
Dust emissions	–	–	0.01	< 0.01	–	–	–	–
Total	0.13	0.18	0.02	0.01	< 0.01	0.02	< 0.01	42

The greatest contributors to these pollutants are construction equipment exhaust, construction worker commuting and material delivery, and fugitive dust emissions from general construction and earthmoving. The total mass of each pollutant is equal to or less than 0.01% of the counties' emission inventories for 2011.

Operational activities that have the potential to release regulated pollutants include the following:

- Road dust emissions and tailpipe emissions from occasional travel along the road for power line maintenance (less than once per year).

Emissions from operational activities have been estimated from the proposed access roads and are detailed in Table 3.4-5. Inspection activities are based on SCAQMD emission factors for on-road vehicles and EPA AP-42 emission factors for unpaved roads (EPA 2006; SCAQMD 2007b).

Table 3.4-5. Estimated Operational Emissions from Proposed 115-kV Power Line Access Roads, in Tons per Year

Activity	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	HAPs	GHGs
Inspection activities	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 1
Total	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 1

The greatest contributors to these pollutants are fugitive dust emissions and tailpipe emissions due to inspection activities. The total mass of each pollutant is equal to or less than 0.01% of the counties' emission inventories for 2011.

Construction emissions of the proposed APS access roads would be minor and short term; operational emissions would be minor and long term. It is expected that air resources would retain the existing character and overall baseline conditions.

No direct or indirect impacts to climate are anticipated from construction, operation, and maintenance of the proposed APS access roads. While there would be a small amount of GHGs produced, this would result in a negligible addition to overall GHG emissions that would not be measurable when considered on a national or global scale.

Mitigation Measures

Air quality impacts associated with construction projects primarily arise from fugitive dust generation by vehicles and equipment for construction, operation, and maintenance under the FMBI and APS Proposed Actions.

As part of the applicant-committed environmental protection measures described in Chapter 2 and in Section 3.4.2, FMBI will comply with the applicable regulations and conditions of the air quality permit

for the control of fugitive dust. This includes using water or BLM-approved dust palliatives to control dust from the proposed stockpile extension, monitoring wells, and associated access roads.

As part of the applicant-committed environmental protection measures described in Chapter 2, APS will minimize soil disturbance areas and implement dust control measures during the construction period to mitigate air quality impacts from fugitive dust.

No additional mitigations measures are recommended by BLM.

Cumulative Impacts

Cumulative impacts include impacts from the Proposed Actions, and neighboring past, present, and future projects, to determine whether these projects, taken together, would contribute to air quality deterioration. Cumulative impacts to air resources are discussed as current air quality trends expected to continue in the area, present actions and reasonably foreseeable future projects that may have an effect on air quality, and climate change. The analysis area for cumulative impacts to air resources is the same as direct and indirect effects. These possible impacts are analyzed below.

AIR QUALITY

Cumulative impacts to air resources from the FMBI Proposed Action would be minor. The analysis area is at present characterized by largely remote, undeveloped areas, with the primary source of emissions being the operation of the Bagdad Mine itself. As the analysis area is not currently experiencing expansion or increase in mining activities, and the impacts from the proposed stockpile extension, monitoring wells, and associated access roads would be minor, air quality trends that have been developing over the past 20 years are expected to continue.

Air emissions from the proposed APS access roads would be minor and short term, lasting only for the duration of the construction period (approximately 3 weeks). Given the low level of emission-producing activities associated with construction, operation, and maintenance of the proposed access roads, the contribution to cumulative air emissions within the analysis area would be negligible.

CLIMATE CHANGE

Current research suggests that climate change would have several effects on the project area and throughout Arizona. Temperature levels in the Southwest are anticipated to rise as a result of global climate change. By the end of the twenty-first century, temperatures could rise by 5°F to 8°F. Overall precipitation levels in the Southwest are anticipated to fall by as much as 10% as a result of global climate change. The effects of these changes on the project area are expected to be an increased risk of drought and wildfire (U.S. Forest Service 2010).

Climate change impacts from the end-use of mined materials are not effects of the proposed planning decisions and thus are not required to be analyzed under NEPA. The BLM does not determine the destination of the resources produced on federal lands, and the effects from consumption of the processed minerals are beyond the scope of agency authority or control.

As the Bagdad Mine would not expand or increase operations under the FMBI Proposed Action, the amount of GHGs resulting from the proposed stockpile extension, monitoring wells, and associated access roads would remain the same as current levels. Therefore, there would be no addition to cumulative GHG emissions in the atmosphere on a local, national, or global scale.

The proposed APS access roads would result in a negligible addition to cumulative GHG emissions. Therefore, there would be a negligible addition to cumulative GHG emissions in the atmosphere on a local, national, or global scale.

3.5 WATER RESOURCES

The following section describes the baseline conditions of the affected environment for water resources, which includes the discussion of both surface water and groundwater.

3.5.1 Resource Issues and Indicators for Analysis

Resource issues identified during scoping and related to water resources (see Table 1.7-4) carried forward for analysis include the following:

- What would the effect of the Proposed Actions and alternatives be on surface-water and groundwater quality in the project area and area watershed? Specifically, what would the impact be on the Burro Creek and Santa Maria Subbasins in terms of heavy metals?
- Will the actions affect the quantity of water needed?
- How will the project affect groundwater quality, including fate, transport, tailings seepage, and capture of pregnant heap leach solution?
- What are the water quality standards and status of Burro Creek and Boulder Creek (total maximum daily load [TMDL])?
- What are the water quality standards and status for the area's groundwater (maximum contaminant levels for metals)?

Indicators used to analyze these issues are as follows:

- the potential effects on surface and groundwater quality in the area and in the watershed, specifically on the Burro Creek and Santa Maria Subbasins; and
- the potential loss of surface water sources within the project area as a result of the proposed projects.

For surface water quality and quantity, analysis indicators consist of the amount and extent of disturbance to surface drainages. For groundwater quality, analysis indicators consist of the flow of groundwater and potential for the groundwater to be contaminated.

3.5.2 Affected Environment

Surface water

The analysis area for surface water resources are the Burro Creek and Santa Maria watershed basins. Regionally, the Bagdad Mine, the proposed stockpile extension, and the APS access roads are located in the ADWR's Upper Colorado River Planning Area. Locally, the proposed stockpile extension area and 650 feet (nearly 20%) of the proposed APS access roads are situated on the southeastern edge of the Burro Creek subbasin (which comprises approximately 695 square miles); 0.5 mile (80%) of the total 0.6 mile proposed APS access roads are situated in the Santa Maria subbasin (approximately 880 square miles). Both subbasins are within the Bill Williams basin (3,350 square miles) (ADWR 2009). Surface water resources in the subbasins consist of washes and reservoirs or stock tanks. Most of the washes in

the subbasins are ephemeral (flowing only in response to storm events), with some major drainages displaying intermittent (flows present during certain times of the year) or perennial (continuing throughout the year) flow. Stock tanks are artificial catchments typically constructed in a drainage way for use in watering livestock and/or wildlife.

Surface water drainage in Burro Creek Subbasin generally flows west-southwest toward the Big Sandy River via two principal drainages, Boulder Creek and Burro Creek. Boulder Creek is intermittent for its entire length, and Burro Creek has both intermittent and perennial reaches (ADWR 2009). U.S. Geological Survey (USGS) stream gage 09424447 is located in the lower reaches of Burro Creek at old U.S. 93 Bridge, approximately 12 miles downstream of the proposed project. Flow data have been recorded at this gage for over 21 years and indicate flow is highest in the winter months, with a mean daily flow ranging from 0.5 cubic foot per second (cfs) to 1,120 cfs (USGS 2015a). The southern portion of the proposed project area lies along a ridgeline—a point at which surface drainage is directed either to the north toward Boulder Creek or to the south toward Bridal Creek and eventually the Santa Maria River. Surface water drainage in the Santa Maria Subbasin generally flows west toward Alamo Lake via the Santa Maria River. The Santa Maria River has both intermittent and perennial reaches (ADWR 2009), with a USGS stream gage (09424900) located approximately 18 miles downstream of the proposed project. Flow data have been recorded at this gage for 47 years and indicate flow is highest in the winter months, with a mean daily flow ranging from 0.12 to 347 cfs (USGS 2015a).

There are two surface waters in the vicinity of the proposed project that have been designated by ADEQ as Impaired Waters. Boulder Creek was designated as impaired in 2010 for beryllium, and Coors Lake was designated in 2004 for mercury in fish tissue. Boulder Creek is part of the ADEQ water quality improvements program called TMDL. TMDLs have been identified for arsenic, copper, and zinc along portions of Boulder Creek. The most stringent Arizona Water Quality standards on Boulder Creek for arsenic, copper, and zinc are 50 micrograms per liter ($\mu\text{g/L}$), 17.91 $\mu\text{g/L}$, and 232.9 $\mu\text{g/L}$, respectively. The in-stream TMDL water quality targets for these parameters are 47.5 $\mu\text{g/L}$, 17.01 $\mu\text{g/L}$, and 221.26 $\mu\text{g/L}$, respectively (ADEQ 2004).

Even though these impaired waters are located in Burro Creek Subbasin, both are located more than 3 miles upstream of the proposed projects, beyond the existing open pit (ADEQ 2015). The open pit acts as a hydrologic barrier to surface water flow; therefore, there is no hydrologic connection between the Proposed Actions and these impaired waters.

All of the proposed stockpile extension area lies to the north of the ridgeline; therefore, surface water for this proposed action would flow north to the open pit. While both Boulder and Burro Creeks are located north of the proposed stockpile extension (3.5 miles and over 6 miles away, respectively) there are six smaller ephemeral drainages that occur within the footprint of the proposed stockpile extension. All six drainages flow toward the existing open pit to the north and therefore do not contribute to downstream flow in either Boulder or Burro Creeks. Determination of waters of the U.S. (WUS) is under the jurisdiction of the U.S. Army Corps of Engineers (USACE). However, because all of the ephemeral drainages within the footprint of the proposed stockpile extension are hydrologically isolated, and because the drainages have no nexus to downstream waters or to traditional navigable waters, the USACE would typically not classify these drainages as WUS under Section 404 of the CWA.

Table 3.5-1 is a summary of water features in the project area. A review of the USGS topographic map and data collected during a field reconnaissance survey conducted in August 2014 found evidence of four stock tanks (S1 through S4 in Figure 3.5-1) and one potential seep (G2 in figure 3.5-2) within the proposed project area (see Appendix D, Biological Survey Report). Following is a discussion of the stock tanks; the seep and the springs that feed the stock tanks are discussed below under the Groundwater Section.

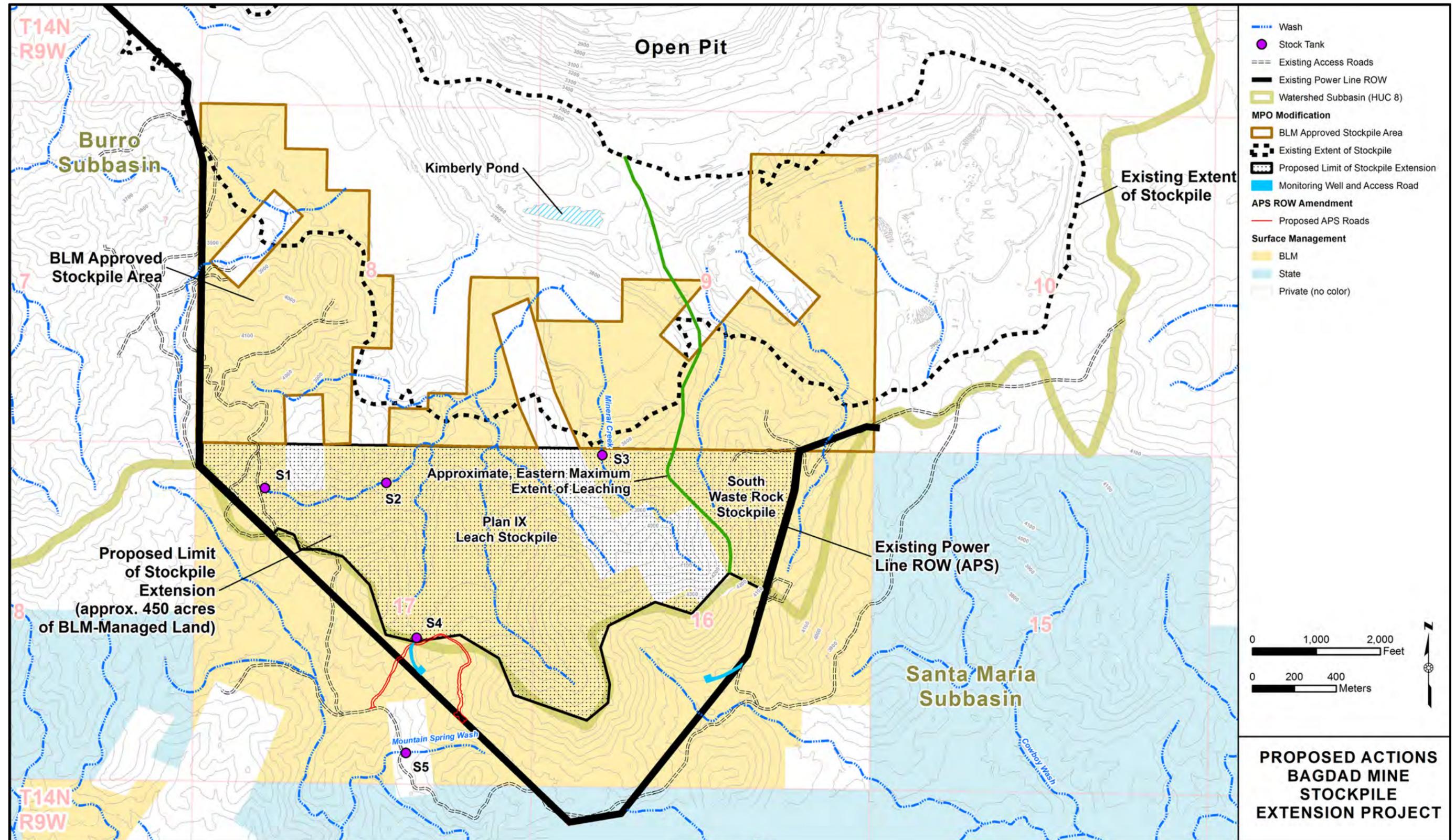


Figure 3.5-1. Surface water features within the vicinity of the project area.

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The USFWS (2015) online National Wetlands Inventory Mapper identified one freshwater pond in the same location as the stock tank in the northwest section of the proposed stockpile extension (S1 in Figure 3.5-1); however, this constructed feature has been washed out and no longer holds water. Two of the stock tanks are constructed boxes associated with springs (S2 and S3), and one is a constructed earthen berm (S1). All three of these constructed stock tanks were found to be non-functional; they have been washed out or filled in with sediment and no longer retain water (see Table 3.5-1). The fourth stock tank observed within the project area during the field reconnaissance survey is identified as S4 in Figure 3.5-1. This is an aboveground metal tank that appears to be fed by the adjacent well.

Table 3.5-1. Surface Water and Groundwater Features in the Analysis Area

Feature	Telesto Feature ID	Description	Location Relative to Ridge	Elevation (feet amsl)
S1	S1	Stock tank; constructed berm is washed out; tank no longer retains water	North	3,968
S2/G1	S2	Spring collector tank/cattle box; full of sediment; no standing water	North	3,798
G2	S4	Potential seep; surface expression of water observed during field survey	North	3,878
S3/G3	S5	Concrete spring box; full of sediment; no standing water (along Mineral Creek drainage)	North	3,692
S4/G4	S7	Open-topped, aboveground metal tank (fed by windmill operated pump/well in fault zone)	On top of ridge (north of divide)	3,954
S5 Mountain Spring	S6	Concrete/rock spring box at spring. Downgradient ranch area includes one circular metal stock tank and one long and thin, rectangular stock tank. The two stock tanks are not connected to the spring and are fed by precipitation.	South	3,802

Source: Telesto (2015a).

The majority of the proposed APS access roads (82%) are located to the south of the above-mentioned ridgeline. Thus, surface water for this Proposed Action would flow south toward Bridal Creek and eventually to the Santa Maria River. The 0.6 mile of proposed access roads would not cross any major washes in either the Santa Maria or the Burro Creek subbasins. In addition, no portion of the proposed APS access road project area in the Santa Maria Subbasin would cross any water features that exhibit signs of ordinary high-water mark or could be classified as WUS under Section 404 of the CWA (Telesto 2015b).

Groundwater

As previously discussed, the Proposed Actions lie in the Burro Creek and Santa Maria subbasins in the Bill Williams basin. The groundwater aquifers underlying the subbasins constitute the analysis area for groundwater resources. Aquifers in the basins include recent stream alluvium, basin fill, and volcanic rock; the principal water-bearing aquifer is generally the basin fill (ADWR 2009). Groundwater flow across the Burro Creek and Santa Maria Subbasins varies but is generally northeast to southwest. However, in the vicinity of the Proposed Actions, groundwater flow is toward the existing open pit mine to the north. The pit has created a groundwater cone of depression in the southern portion of the Burro Creek Subbasin and the northern portion of the Santa Maria Subbasin that captures groundwater flow and has created a hydraulic gradient toward the pit. Because of the cone of depression, and in combination with the underlying crystalline bedrock, groundwater in the area of the proposed stockpile extension

flows north toward the open pit. The cone of depression toward the pit acts as a groundwater capture zone (see Figure 3.5-2).

A review of ADWR Wells 55 Registry GIS database (ADWR 2015) indicates there are 20 active wells (exempt and non-exempt) within 1 mile of the Proposed Action areas and that groundwater level in these wells ranges from 12 to 2,000 feet below ground surface. One well (#600896), identified as G4 in Figure 3.5-2, is located within the area proposed for the stockpile extension, although as described in Section 2.2.1, FMBI has committed to not impact this well. A summary of the wells is provided in Table 3.5-2, and well locations are depicted in Figure 3.5-2).

Table 3.5-2. Wells within 1 Mile of Project Area

Well Registry ID	Owner Name	Well Depth (feet)	Water Level (feet below ground surface)
202759	PHELPS DODGE BAGDAD INC	–	–
216206	PHELPS DODGE BAGDAD INC	715	71
546556	CYPRUS BAGDAD COPPER	100	12
535948	CYPRUS BAGDAD COPPER	185	123
535950	CYPRUS BAGDAD COPPER	145	–
570176	CYPRUS BAGDAD COPPER	104	18
600887	EDGAR KELLIS	162	60
600895	EDGAR KELLIS	125	50
600896	EDGAR KELLIS	115	50
611646	CYPRUS MINES CORP	2500	2000
611648	CYPRUS MINES CORP	750	750
614752	PHELPS DODGE BAGDAD INC	8	30
614754	AZ STATE LAND DEPT	162	23
614757	AZ STATE LAND DEPT	140	–
614758	AZ STATE LAND DEPT	–	–
642295	BLM-PHOENIX DISTRICT	–	–
637220	EDGAR KELLIS	140	–
913605	FREEPORT-MCMORAN BAGDAD, INC.	720	166
805579	AZ STATE LAND DEPT	25	15
805581	AZ STATE LAND DEPT	30	–

Source: ADWR (2015).

Springs are formed when groundwater reaches the earth's surface; springs that emit exceptionally low flows are referred to as seeps. A review of USGS data and additional field data gathered during an August 2014 reconnaissance survey (see Appendix D) indicates there are two springs and one seep within the area proposed for the stockpile extension. These are termed G1, G2, and G3 and are depicted in Figure 3.5-2 and listed in Table 3.5-1. No flow data are available for these seeps or springs.

With regard to existing regional groundwater quality it varies across the subbasins. However, there are numerous sites throughout the Burro Creek and Santa Maria subbasins that have reported exceedances in drinking water standards.

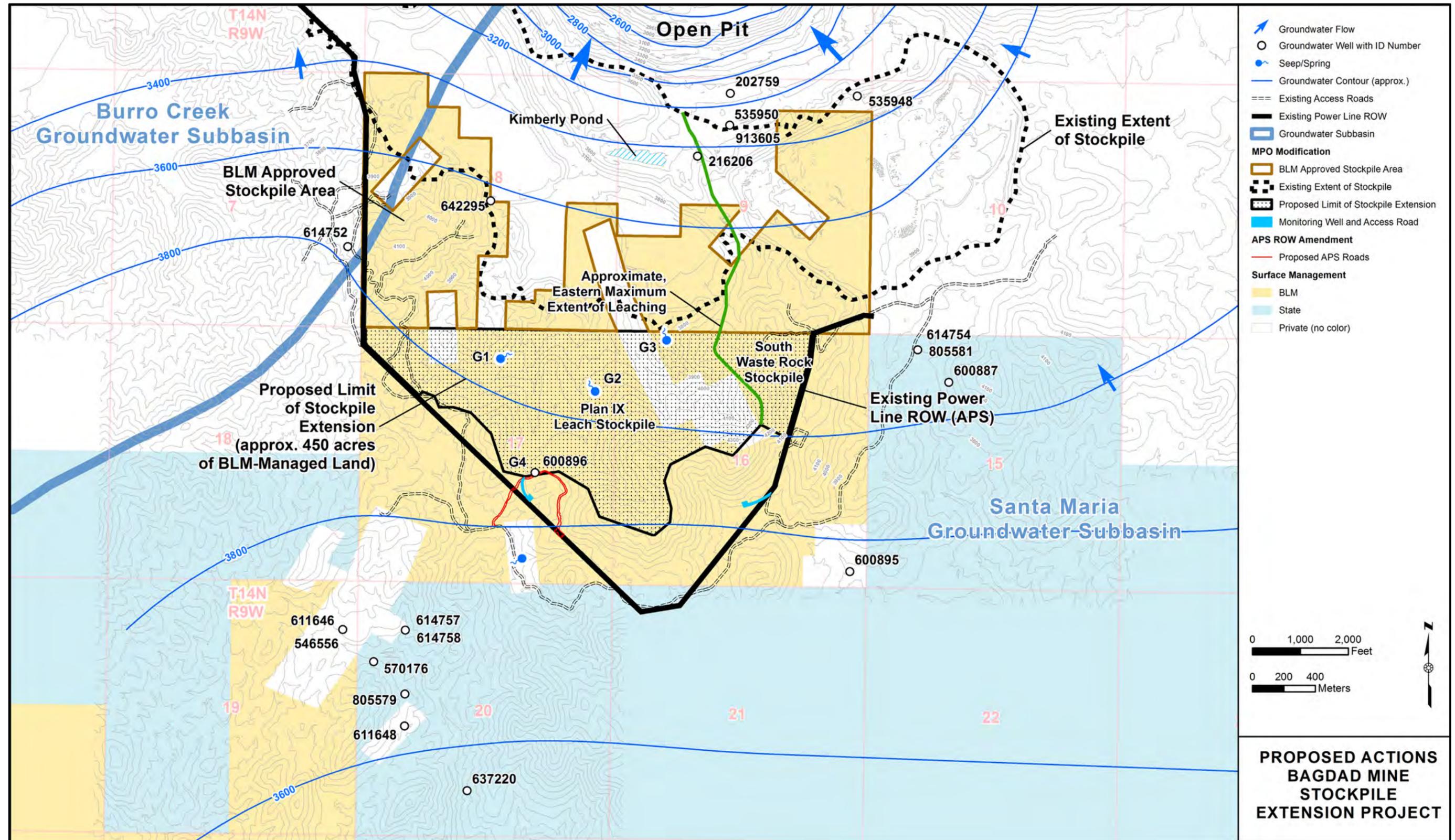


Figure 3.5-2. Groundwater features within the vicinity of the project area.

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The most frequently equaled or exceeded parameters in publicly reported measurements for the subbasins include arsenic, radionuclides, and fluoride (ADWR 2009). As discussed in Chapter 2, the Bagdad Mine and all mining-related operations are currently covered under an APP and subject to permit conditions to protect groundwater quality. The APP would be reviewed with ADEQ and updated as necessary to reflect the proposed stockpile extension.

3.5.3 Environmental Consequences

Surface Water

PROPOSED BAGDAD MINE STOCKPILE EXTENSION

The proposed stockpile extension would adversely and directly impact six ephemeral washes. As planned, the proposed stockpile extension would ultimately cover six isolated ephemeral washes, thus permanently disturbing them. All six washes are in the headwaters of the Burro Creek watershed, and any ephemeral flow that occurs in them drains north toward the existing open pit. The proposed stockpile extension lies entirely north of the ridgeline, and it would continue to be specifically constructed so that all surface water runoff would be directed to and captured by the open pit. Therefore, if any surface water flow were to contain heavy metals, all would be captured by the open pit, and none would impact downstream Burro Creek.

As described in Section 2.2 in Chapter 2, the design would also include methods for collecting PLS and directing it to existing leach collection facilities. Since surface runoff from both the existing stockpile and the stockpile extension are captured by the open pit, there would be no discharge of PLS or stormwater runoff to downstream surface waters. In addition, as described in the applicant-committed environmental protection measures section in Chapter 2, FMBI would avoid disturbance to the stock tank located just within the proposed limit of stockpile extension southern boundary (see S4 in Figure 3.5-1). This surface water feature is generally located on the ridgeline and would remain undisturbed by the waste rock in the stockpile extension, which would be below the ridgeline. With the application of this mitigation measure, there would be no impact to the one functioning stock tank located within the project area. With the application of protection measures, direct impacts to surface water quantity and quality from the proposed stockpile extension would be negligible and long term.

Indirect impacts to downstream surface water resources could include 1) reduction of stormwater flow contributing to downstream washes, or 2) erosion and sedimentation, or a pathway for heavy metals, associated with runoff from the side slopes of the proposed stockpile extension. Because flows in the six impacted ephemeral drainages are isolated and they are each intercepted by the existing open pit, there would be no pathway to downstream waters and therefore no indirect impact to downstream surface water quality or quantity, including for Butte Creek, Burro Creek, or any other downstream surface waters. Further, there would be no impact from surface water runoff to downstream waters in the Santa Maria Subbasin, or to Mountain Spring, which is located in the Santa Maria Subbasin, because the proposed stockpile extension is located over the ridgeline in the Burro Creek Subbasin. With regard to erosion and sedimentation, the proposed stockpile extension would be specifically constructed as benches, which would minimize runoff from the side slopes; all runoff would be directed north toward the pit. With the application of mitigation measures, there would be no indirect impacts to surface water resources.

PROPOSED 115-KV POWER LINE ACCESS ROADS

The proposed APS 115-kV power line access roads would not directly impact washes that could likely be classified as WUS. During construction of the access roads there is a potential for erosion and sedimentation, which would indirectly impact surface water quality in downstream washes. Construction

of the access roads would be subject to AZPDES permitting under Section 402 of the CWA, and erosion control measures would be required. With the application of erosion control measures, impacts to surface water quality during the construction of the proposed access roads would be negligible and short term.

Erosion and sedimentation associated with the use of the access roads over time and associated with runoff from storm events could also occur, thus resulting in impacts to downstream surface water quality. The intended purpose of the roads would be to access the power line for maintenance; as such, they would be subject to only light use. The presence of new road segments in the area would, however, open up the possibility of casual recreational use that was not previously available. With the use of erosion control measures and BMPs, and because the overall footprint of the access roads is small (1.4 acres) relative to the Santa Maria Subbasin (880 square miles), these impacts would be negligible but long term. There would be no impacts to surface water quantity.

CUMULATIVE IMPACTS

The analysis area for cumulative impacts to surface water resources is the same as that for the affected environment. Past and present projects in the analysis area for cumulative impacts to surface water consists of grazing and recreational activities, construction of the APS power line, the past and present operations of the Bagdad Mine, and the impaired waters located in the vicinity of the proposed project. Grazing and recreational use can both remove vegetation, increase soil compaction, and/or cause soil displacement, all of which can result in erosion. Both of these uses have long-term effects on the quality of surface water runoff due to an increase in erosion. Although vegetation was removed from the ROW during construction of the APS power line as well, effects on surface water quality will gradually diminish as vegetation becomes reestablished after the construction phase (except within actively used maintenance roads). The excavation of the open pit at Bagdad Mine has impacted surface water resources by capturing upstream surface water flow and exposing surface water runoff to industrial activities associated with the mine. Because surface water flow would be directed to the open pit, there would be no additional impacts to the impaired waters located downstream of the mine.

The impacts from the proposed stockpile extension and the APS access roads are anticipated to be negligible. Neither Proposed Action would significantly contribute to the above-stated cumulative impacts to surface water resources.

MITIGATION MEASURES

As part of the applicant-committed environmental protection measures presented in Chapter 2, the following would occur as part of the Proposed Action:

- FMBI would develop a detailed reclamation plan that includes recontouring and revegetation of the stockpile, which would mitigate impacts to surface water quality from erosion. FMBI would also implement appropriate BMPs during construction of the access roads to protect surface water quality in accordance with the Multi-sector General Permit (MSGP) and SWPPP. FMBI has committed to avoid disturbance to the one functioning stock tank located just within the proposed limit of the stockpile extension southern boundary.
- Prior to the initiation of the proposed project, APS would be required to obtain a CWA Section 402 stormwater permit. Construction of the APS access roads would disturb more than 1 acre and as such would be subject to AZPDES permitting under CWA Section 402. As such, permit conditions require development of a SWPPP, which would detail erosion control measures to be put in place during construction and until revegetation of surface disturbance is completed and final stabilization is established. These erosion control measures would mitigate impacts to surface water quality.

In addition, the BLM recommends the placement of permanent erosion control measures such as water bars and/or berms along the APS access roads to protect surface water quality by controlling runoff from access roadways.

Groundwater

PROPOSED BAGDAD MINE STOCKPILE EXTENSION

Because the proposed stockpile extension does not change the amount of water the mine would use or where that water would come from, there would be no impact to groundwater quantity. There would be no impact to Mountain Spring (S5 in Figure 3.5-1) because it is located farther south outside the footprint of the proposed stockpile extension. In addition, FMBI would avoid disturbance to the groundwater well located just within the proposed limit of stockpile extension southern boundary (see G4 in Figure 3.5-2). This well is generally located on the ridgeline and would remain undisturbed by the waste rock in the stockpile extension, which would be below the ridgeline. With the application of this mitigation measure, no direct impacts are expected to occur to the groundwater well.

The Proposed Action would adversely and directly impact two springs (G1 and G3) and one seep (G2) that are located within the footprint of the proposed stockpile extension by completely burying them. Because these springs and seeps are low flow, overall impact relative to groundwater resources would be negligible but long term. With regard to groundwater quality, if any seepage were to occur beneath the proposed stockpile extension, it would be captured in the hydrologic groundwater sink that has been created by the existing open pit. Further, the underlying crystalline bedrock would block the transport of any potential contamination to groundwater. Therefore, no impacts are expected to occur to groundwater quality.

PROPOSED 115-KV POWER LINE ACCESS ROADS

No impacts are expected to occur to groundwater resources from the proposed APS access roads.

MITIGATION MEASURES

As part of the applicant-committed environmental protection measures presented in Chapter 2, the following would occur as part of the Proposed Action:

- FMBI would regularly review its current area-wide APP with ADEQ in the manner and according to the schedules specified in Section 2.7, Reporting and Recordkeeping Requirements, of the APP (Permit No. P-105258, available at www.azdeq.gov) and update it as required to include all elements of the proposed stockpile extension.
- FMBI has committed to avoid disturbance to the groundwater well located just within the proposed limit of the stockpile extension southern boundary.

CUMULATIVE IMPACTS

The analysis area for cumulative impacts to groundwater resources is the same as that for the affected environment. Past and present projects in the analysis area for cumulative impacts to groundwater consist of mineral extraction and development in the area, including the operations of the Bagdad Mine. These past and present activities impact groundwater resources with the elimination of areas where groundwater reaches the earth's surface (i.e., springs) and by creating a cone of depression in the groundwater flow patterns. They have an impact on groundwater quality by exposing aquifers to the fate and transport of pollutants associated with mining activities.

The impacts from the proposed stockpile extension are expected to be negligible and no impacts are expected to occur from the APS access roads. Neither Proposed Action would contribute significantly to the above-stated cumulative impacts to groundwater resources.

3.6 GEOLOGY AND SOIL RESOURCES

The potential concerns identified related to geology and soil resources are soil erosion and acid rock drainage. The process of erosion, sediment transport, and delivery is the primary pathway for introducing elements such as nutrients, metals, and organic compounds into watersheds. Water quality impairment can result, in part, because a number of pollutants are preferentially adsorbed onto mineral or organic particles found in fine sediment.

Acid rock drainage refers to the acidic water that is created when sulfide minerals are exposed to air and water and, through a natural chemical reaction, produce acid. The acid runoff can further dissolve heavy metals such as copper, lead, and mercury into groundwater or surface water.

Local geology, soil types present on the site and their relevant characteristics and properties, and the potential for acid rock drainage are described below.

3.6.1 Resource Issues and Indicators for Analysis

The identified resource issues related to geology and soil are acid rock drainage from stored ore material and erosion of soil by water and/or wind. Resource issues identified during scoping and related to geology and soil resources (see Table 1.7-4) carried forward for analysis include the following:

- How would soils be affected by vegetation removal and alteration of water flow patterns resulting from the Proposed Actions and alternatives (including waste rock extension; facilities and road development; use and maintenance of roads and facilities over the entire footprint of the waste rock extension)?
- What is the potential for the Proposed Action to cause acid rock drainage off the stockpile site?

Indicators used to analyze these issues are as follows:

- potential disturbances to soil that would result in potential for erosion by water or wind; and
- the potential for acid rock drainage to be detected off-site.

3.6.2 Affected Environment

The analysis area for geology and soil direct impacts for the proposed Bagdad Mine stockpile extension and APS ROW consists of the footprint of the proposed stockpile, the monitoring well pads and access roads, and the additional APS ROW. For indirect impacts, the analysis area consists of a 1-mile buffer around the above features. Local geology, soil types present on the site and their relevant characteristics and properties, and the potential for acid rock drainage are described below.

Geology

The site is mapped within the Basin and Range physiographic province, which is characterized by northwest-southeast-trending mountain ranges separated by broad alluvial valleys. The site is close to the

edge of the Central Highlands transition zone, which is characterized by rugged mountains of igneous, metamorphic, and sedimentary rocks (ADWR 2010).

Data from the USGS's mineral resources and geologic maps of U.S. states indicates that the FMBI and APS Proposed Actions are located entirely within the Early Proterozoic metavolcanic rocks mapping unit. This mapping unit is made of weakly to strongly metamorphosed volcanic rocks. The unmetamorphosed parent materials from which this unit was formed include basalt, andesite, dacite, and rhyolite deposited as lava or tuff, related sedimentary rock, and shallow intrusive rock. These rocks, widely exposed in several belts in central Arizona, include metavolcanic rocks in the Yavapai and Tonto Basin supergroups. The primary rock type in this mapping unit is greenstone, and the secondary rock type is intermediate metavolcanic rock (Richard et al. 2000; USGS 2015b). The Early Proterozoic metavolcanic rocks mapping unit is not a common geological unit in the area. It appears to be regionally limited to the eastern slope of the Grayback Mountains, which run in a southwestern direction from Bagdad Mine.

The Mountain Spring fault cuts through the west half of the FMBI and APS Proposed Actions, west of the open pit. The fault separates different formations along its northern extent, northwest of the Bagdad Mine, cutting through the granitic rock map unit in the areas of the Proposed Actions. Along the length of the fault are intrusions of rhyolite, porphyritic diorite, and porphyritic quartz monzonite (Anderson et al. 1955). The Mountain Spring fault is mineralized at the Mountain Spring mine, approximately 3 miles south-southwest of Bagdad. Along with the Hillside fault, the Mountain Spring fault may have influenced the distribution of gold, silver, lead, zinc, and copper deposits in the area (Anderson et al. 1955).

ACID ROCK DRAINAGE

Acid rock drainage is a natural process that takes place as mineralized rock surface areas are weathered and infiltrating stormwater becomes acidic. As the drainage becomes more acidic, it has the potential to leach out other elements, particularly metals, from the rock. This can result in polluted runoff, which can impact the quality of surrounding surface water bodies. Typically, acid rock drainage occurs naturally in the environment at a very slow pace, but mining activities accelerate the process by exposing a large amount of rock to weathering in a short amount of time. Additionally, mine-processed rock and fractured waste rock have an increased amount of exposed surface area that can come into contact with water and oxygen. However, it should be noted that the potential for acid generation is highly dependent on the mineral composition of the particular rock in question.

This section summarizes the potential for rocks associated with the stockpile extension to generate acid. Water resources are discussed in detail in Section 3.5.

ACID GENERATION POTENTIAL OF ON-SITE MINED MATERIALS

The FMBI Proposed Action would continue to stockpile the same mineralized waste rock as is stored in the existing stockpile. A series of analyses was performed to determine the acid-generating potential of the various rock types in the vicinity of the open pit, as documented in the Draft EIS (BLM 1995). The majority of the rock types are not acid producing, with the exception of the quartz monzonite porphyry, which generally is characterized as ore material and directed to the mill for processing. Titan Environmental Corporation (1995) also assessed the acid-generating potential for the mineralized waste rock and other materials (see FMBI 2014:Appendix D). Based on acid base accounting with a strong digestion, there is a 78% probability that the rocks tested were net neutralizing, and when a weak digestion is used (in order to simulate pyrite content), there is a 98% probability that rocks are net neutralizing. Net neutralizing potential (NNP) is the ability to neutralize acids. Rocks with a significant negative NNP are potentially acid-generating. If the NNP is less than -20 kilograms per ton (kg/ton) calcium carbonate (CaCO₃), it is generally accepted that the material is acid producing. For NNP values

between –20 and 20 kg/ton CaCO₃, the acid-generating potential is difficult to determine (USGS 2003). Rocks with negative NNP that were subjected to humidity test cells produced ultimate leachates above a pH of 5 (the minimum to allow vegetation to germinate) with only one test exception producing leachates below pH 4.3 (Titan Environmental Corporation 1995). The identification, handling, and control of potentially acid-forming materials is managed through the establishment of the passive containment capture zone, demonstration of Best Available Demonstrated Control Technology (BADCT) compliance, and monitoring requirements mandated by the APP. The purpose of BADCT is to employ engineering controls, processes, operating methods or other alternatives, including site specific-characteristics (i.e., the local subsurface geology), to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer. In Arizona, mines are allowed to use passive containment hydrologic sinks, such as that at the site of the Proposed Action, as part of their BADCT demonstration to control water pollution from an open-pit mine (ADEQ 2015).

The un-mineralized overburden predominantly consists of Gila conglomerate and basalt. Due to its origin, and chemical and physical makeup, Gila conglomerate and the basalt are inert and non-acid generating (due to a lack of mineralization). These materials do not pose a risk to the environment and may be used for surfacing the coarse rock ramps and stockpile levels to minimize tire wear and other maintenance costs. Because of its silt and clay content and un-mineralized character, Gila conglomerate makes ideal cover material and is readily revegetated. Calcium carbonate cementation of the Gila conglomerate is substantial, helping to neutralize acid when placed in contact or mixed with rocks of an acidic nature.

PREGNANT LEACH SOLUTION DRAINAGE AND FATE IN THE PROJECT AREA

The operation of the expanded stockpile will continue in the same manner as the current stockpile. Overburden and mineralized waste rock materials from the open pit will continue to be placed on the stockpile by haul trucks. Leaching will occur on the Plan IX Leach (western) portion of the stockpile, and overburden/mineralized waste rock will be stored on the South Waste Rock (eastern) portion of the stockpile. The existing stockpile is segregated into two areas: one area that has ore grade rock worth leaching and another area where the acid leaching does not occur. Leachate percolates down to bedrock, then follows natural contours to collection facilities where copper is extracted and the water is recycled. Essentially, the nonporous bedrock prevents infiltration to groundwater, while the natural bedrock gradient directs leachate to a collection facility for processing and reuse. A 1995 study by Titan Environmental Corporation (1995) concluded that the local steep slopes encourage runoff rather than infiltration, seepage is effectively collected on-site in retention ponds or pits, and no acid rock drainage potentially generated would leave the site.

On the proposed project, percolating leach solution would reach the bottom of the stockpile and perch on top of the natural crystalline bedrock. Perching occurs because the leach application rate is several orders of magnitude higher than the hydraulic conductivity of the underlying crystalline bedrock. Perched solution then follows the natural grade to leach collection facilities at the toe of the stockpile. From the leach collection facilities, the solution is pumped via pipelines to a plant that recovers the metals, producing copper cathodes. The process water is then recycled by returning it to the stockpile to restart the process.

In the area of the proposed stockpile extension, the metamorphosed formation of the underlying Precambrian, crystalline bedrock has little primary porosity, corresponding to its low hydraulic conductivity. Therefore, the ability for the Precambrian, crystalline bedrock underlying the proposed stockpile extension to transmit groundwater is restricted. Demonstration of the low hydraulic conductivity of the crystalline bedrock is one of the key points in attaining compliance with the BADCT requirements of the facility's APP.

As described in the MPO Modification, the BADCT demonstration ensures that engineering controls, processes, and operating methods or other alternatives, including site-specific characteristics, are employed to reduce discharges of pollutants to the greatest degree achievable before pollutants can reach the aquifer or to prevent pollutants from reaching the aquifer.

The BADCT demonstration for the stockpile is based upon site-specific characteristics, which include a combination of crystalline bedrock with a low hydraulic conductivity, and northward sloping topography beneath the stockpile. This ensures that the existing stockpile and proposed stockpile extension will continue to convey stormwater flow and leachate toward the open pit. Stormwater flow from the stockpile and proposed stockpile extension is captured by the open pit and does not have the potential to discharge to downgradient, receiving waters. Beneath the stockpile and proposed stockpile extension (and other areas surrounding the open pit), the groundwater gradient is sloped in the direction of the open pit. An inward hydraulic gradient is typical in a hard rock mining environment, where the dewatering of saturated bedrock around the open pit occurs in response to the excavation and removal of materials from the open pit. Excavation of the open pit has created a cone of depression (an inward hydraulic gradient) that draws and captures groundwater potentially impacted by the stockpile. Together, these site-specific characteristics comprise the “passive containment capture zone” required for BADCT demonstration. The mine pit creates a passive containment that is sufficient to capture the pollutants discharged and that is hydrologically isolated to the extent that it does not allow pollutant migration from the capture zone.

As part of the BADCT demonstration, Woodward Clyde developed a groundwater flow model in 1995. The model analysis and mapping showed that the Bagdad open pit creates an adequate passive containment capture zone around the individually permitted APP facilities, including the stockpile and the area of the proposed stockpile extension. This model also demonstrates that the passive containment capture zone would be maintained after mine closure. The APP requires that a post-audit of the passive containment capture zone model be performed every 5 years to compare predictions with currently observed groundwater levels and to refine the model, as necessary. To meet this requirement, Schlumberger (2014) enhanced the approach to simulating groundwater flow to the pit through the development of a three-dimensional, numerical groundwater flow model. The groundwater flow models by Woodward Clyde (1995) and Schlumberger both confirm that the natural, crystalline bedrock, in combination with the northward sloping topography and inward hydraulic gradient created by the excavation and construction of the open pit, function as effective containment.

Results of the 2014 review and update of the groundwater model are depicted in Figure 6 of the MPO Modification (FMBI 2014). The groundwater elevation and hydraulic gradient map depicted therein shows a cone of depression and groundwater gradient centrally toward the open pit, demonstrating the inward hydraulic gradient successfully created by the open pit.

Soils

A review of soils data from the Natural Resources Conservation Service (NRCS) (2015a) indicates that the majority of the site is mapped as Barkerville cobbly sandy loam, 20% to 60% slopes. The Barkerville series consists of moderately deep, somewhat excessively drained soils that formed in slope alluvium weathered from granite and closely related rocks. These soils are found on hill slopes and mountain slopes at elevations of 4,000 to 7,500 feet. The organic matter content is less than 1%, and bedrock (granite with a few fractures) is typically encountered between 26 and 40 inches. The frost-free period is 140 to 180 days. Barkerville soils exhibit medium runoff and moderately rapid permeability. Areas with these soils are typically used for livestock grazing (NRCS 2015b).

Approximately the western one-fourth of the site is mapped as Moano gravelly loam, 0% to 30% slopes. The Moano series consists of very shallow and shallow, well-drained soils that formed in place in

residuum from phyllite or schist bedrock. Moano soils are found on gently rolling to steep schist hills at elevations of 4,000 to 5,500 feet in a semiarid continental climate. These soils exhibit medium runoff and moderate permeability. Rangeland is the typical use for areas with Moano soils. The depth to extremely hard schist bedrock is 6 to 16 inches, but may be 20 inches in some areas due to variability in hardness of the parent rock. The soil is slightly acid to moderately alkaline due to the variability of the parent rock (NRCS 2015b).

Detailed information regarding specific characteristics, properties, and parameters of on-site soils are available from a number of sources, including the NRCS (2015c) Soil Survey Program.

Overall, local soils have a low to moderate potential for erosion in their natural vegetated state. Although areas with Moano soils have a high runoff potential, they have a low susceptibility to sheet and rill erosion from water. However, Barkerville soil has a high risk of erosion when vegetative cover is not maintained, and the low T-factors of both soils indicates that it only takes a small amount of soil loss to affect soil productivity. The T-factor is the maximum amount of erosion (in tons per acre) at which the quality of a soil as a medium for plant growth can be maintained. Both soils have a medium to low susceptibility to wind erosion when undisturbed, and bedrock under the soils is near the surface.

3.6.3 Environmental Consequences

The direct and indirect impacts of each Proposed Action as it relates to acid rock drainage and soil erosion are described below.

Proposed Bagdad Mine Stockpile Extension

The FMBI Proposed Action would result in direct, major, long-term impacts to approximately 520 acres of soil because it would be covered as the stockpile is deposited. The use of Gila conglomerate as a cover material and growth medium for stockpile reclamation will act to mitigate some lost values of impacted soil, such as water retention in its clay- and silt-sized particles to promote water storage at the root zone for enhanced vegetative growth. According to an October 5, 2015, memorandum from Telesto (2015c), the qualities of Gila conglomerate provide a favorable seedbed that is readily revegetated and has been used successfully throughout Arizona and New Mexico.

Regarding the potential effects of acid rock drainage, the majority of the rock types are not acid producing, and rocks with negative NNP subjected to humidity test cells produced leachates above a pH of 5 with only one exception. Precambrian, crystalline bedrock with low hydraulic conductivity underlies the area, preventing infiltration to groundwater. Also, the local steep slopes encourage runoff to collection pits rather than infiltration. Capping the tops and benches would further limit infiltration, and seepage is permanently collected in retention ponds or pits. Stormwater flow from the stockpile and proposed stockpile extension is captured by the open pit and does not have the potential to discharge leachate solution to downgradient, receiving waters. With proper mitigation and BMPs, acid rock drainage would not leave the site under this proposed alternative. There would be no direct or indirect short- or long-term impacts of acid rock drainage.

The proposed monitoring well pads and associated access roads would result in direct, minor, long-term impacts to approximately 1.0 acre of soil that would be compacted and covered during their construction.

Proposed 115-kV Power Line Access Roads

Within the corridor of the access roads, soil would be compacted and disturbed, resulting in minor, long-term impacts to soil within the analysis area. Soil in the ROW along the access roads would be protected from damage and soil loss from erosion through mitigation and BMPs.

Mitigation Measures

As part of the applicant-committed environmental protection measures described in Chapter 2, FMBI will comply with the applicable regulations and conditions of the mine's AZPDES permit and SWPPP.

Because the interconnected process of erosion, sediment transport, and delivery is the primary pathway for introducing key pollutants elements such as nutrients (particularly phosphorus), metals, and organic compounds into watersheds, the AZPDES permit includes mitigation for stormwater discharges to prevent water quality impacts from erosion. BMPs would be implemented to also address sediment runoff during any associated road or well construction activities designed specifically for their collection.

The FMBI Proposed Action (including relatively minor quantities of potentially acid-generating rock materials) is located within the hydrologic control of the passive containment capture zone of the open pit. Stormwater coming into contact with such materials will eventually drain to the open pit. As part of the applicant-committed environmental protection measures described in Chapter 2, the closure of the stockpile will cover stockpiled materials beneath the acid-neutralizing Gila conglomerate material. Further, revegetation and the water-holding capacity of the Gila conglomerate will reduce the quantity of water available to contact stockpiled materials. Together, these factors serve to isolate and control potentially acid-forming, toxic, or deleterious materials. The reclamation plan outlined in the MPO Modification will be updated or appended to reflect other agency permits, final designs, or certain stipulations as more specific and detailed engineering designs or information becomes available (Cyprus 1996).

As part of the applicant-committed environmental protection measures described in Chapter 2, APS would implement appropriate measures to mitigate impacts to soil resources as a result of road construction.

No additional mitigation measures are recommended by BLM.

Cumulative Impacts

The analysis area for cumulative impacts is the same as that for direct and indirect impacts described above. Past and present projects in the analysis area for cumulative impacts consist primarily of those associated with the Bagdad Mine itself. No other past, present, or reasonable foreseeable future projects are found within the analysis area for cumulative impacts. Adverse impacts from the proposed Bagdad Mine stockpile extension and APS ROW amendment would be local and contained to the site, and would be minimized through mitigation. Therefore, the Proposed Actions are not anticipated to contribute to cumulative impacts outside the mine. Any future project in and around the Bagdad Mine on state or federal land will be subject to similar state and federal laws and regulations requiring avoidance or mitigation of adverse effects from erosion and acid rock drainage, and would not contribute to cumulative impacts.

3.7 VEGETATION RESOURCES

3.7.1 Resource Issues and Indicators for Analysis

The resource issues identified during scoping related to vegetation resources that were carried forward for analysis are presented in Table 1.7-4 in Chapter 1. General resources issues related to vegetation resources include the following:

- Loss of vegetation, including vegetation communities and individual plants, including special status species, as protected under the ESA, Arizona Native Plant Law (ANPL), and BLM Sensitive species. More specifically for special status species:
 - Direct loss to any population of special status plants that would jeopardize the continued existence of that population.
- Loss to any population of plants or an activity that would result in a species being listed or proposed for listing as endangered or threatened. Degradation of vegetation from soil erosion, dust, changes in surface water quantity or surface water quality, and the introduction and establishment of weed species, including Arizona Department of Agriculture (ADA) noxious weeds, non-native species, and invasive species.

Special Status Species

- The potential for occurrence of special status species within the analysis area was categorized using the following criteria:
 - None – proposed project is well outside the known geographic and elevational range, or lacks suitable habitat necessary for the species, or both. Plants with highly restricted ranges are considered to have no potential to occur if the analysis area is outside their known range, even if the required habitat characteristics are present on-site.
 - Unlikely – proposed project could contain suitable habitat for this species but is outside its known geographic and/or elevational range.
 - May Occur – proposed project is within the geographic and elevational range and has suitable habitat for the species.
 - Present – species was observed during limited field investigations in 2014 as presented in *Bagdad Mine Stockpile Extension Baseline Biological Survey Report* (Telesto 2015a), referred to hereafter as the baseline biological report (provided in Appendix D of this EA).

Using the indicators listed above, each category for each phase of the proposed projects (construction and operation and maintenance) would be analyzed with respect to how vegetation could be impacted by the proposed projects (e.g., change through time).

3.7.2 Affected Environment

Analysis Area

Section 3.2 describes the general requirements used for defining resource-specific analysis areas. The analysis area for assessing potential impacts on vegetation resources includes the footprint of the stockpile extension project area, the APS project area, and a 3-mile radius from those areas (Figure 3.7-1). This analysis area was chosen in order to capture any potential project-related indirect effects on vegetation resources outside the project area. Potential indirect effects could include soil erosion, dust, light, changes in surface water quantity or surface water quality, and invasive plant species introduction.

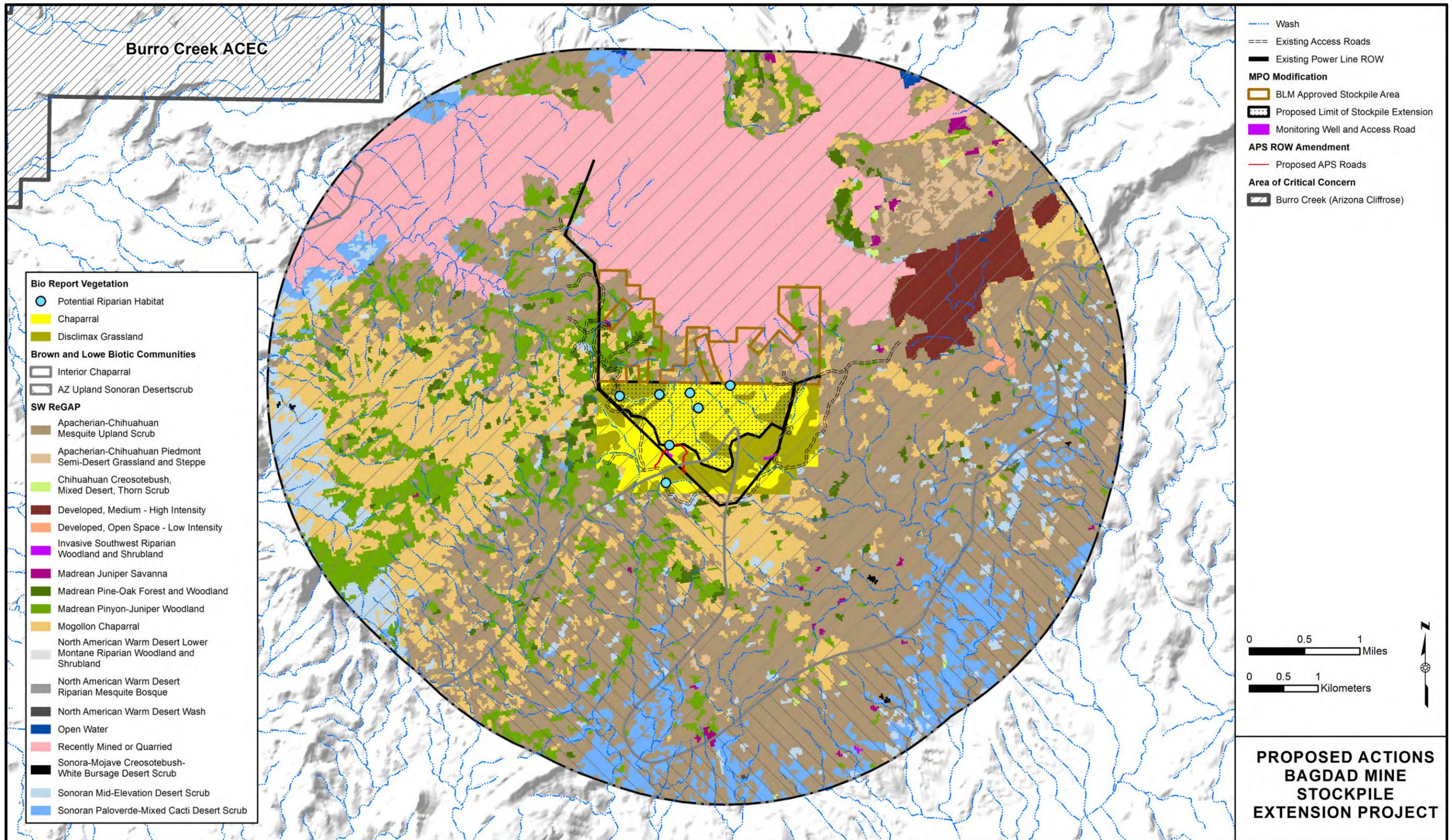


Figure 3.7-1. Vegetation resources in the project and analysis areas.

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However, not all of these potential indirect impacts are expected to occur; instead, this was the basis of the analysis.

Vegetation Communities

Vegetation communities within the project area and vicinity were mapped using Brown and Lowe (1994), Southwest Regional Gap Analysis Program (SWReGAP) (USGS 2004), and vegetation communities as mapped during field visits and described in the baseline biological report (see Appendix D). The acreage of the vegetation communities in the analysis and project areas is presented in Table 3.7-1.

Table 3.7-1. Vegetation Communities in the Project and Analysis Area

Vegetation Community	Acres in Analysis Area	Acres in the Stockpile Extension Project Area	Acres in the APS Project Area
Brown and Lowe			
Arizona Upland Subdivision of Sonoran Desertscrub	6,431.7	34.0	1.6
Interior Chaparral	19,944.6	485.9	5.2
SWReGAP			
Apacherian-Chihuahuan Mesquite Upland Scrub	10,778.5	109.4	1.0
Madrean Pine-Oak Forest and Woodland	403.9	25.0	–
Madrean Pinyon-Juniper Woodland	2,234.2	78.8	0.3
Mogollon Chaparral	4,207.7	299.1	5.5
Recently Mined or Quarried	5,410.1	0.2	–
Sonoran Mid-Elevation Desert Scrub	972.2	7.4	–
Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe	345.1	–	–
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	25.8	–	–
Developed, Medium – High Intensity	574.1	–	–
Developed, Open Space – Low Intensity	28.9	–	–
Invasive Southwest Riparian Woodland and Shrubland	2.0	–	–
Madrean Juniper Savanna	61.8	–	–
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	2.5	–	–
North American Warm Desert Riparian Mesquite Bosque	1.1	–	–
North American Warm Desert Wash	2.7	–	–
Open Water	16.8	–	–
Sonora-Mojave Creosotebush-White Bursage Desert Scrub	8.2	–	–
Sonoran Paloverde-Mixed Cacti Desert Scrub	1,300.7	–	–
Baseline Biological Surveys			
Chaparral	N/A	392.0	4.0
Disclimax Grassland	N/A	127.8	2.8
Boulder Habitat	N/A	–	0.1
Riparian Habitat	N/A	–	–
N/A = Not applicable.			

Arizona Native Plant Law

A total of 18 species protected by the ANPL was observed in the project area during biological surveys. All ANPL species observed in the project area are Salvage Restricted (SR), Salvage Assessed (SA), and/or Harvest Restricted (HR) species. Salvage Restricted native plants are those plants for which a salvage permit is required; collection is allowed only with a permit. The Salvage Assessed category includes those for which a salvage permit is required for removal. Plants in the Harvest Restricted category are protected because they are subject to excessive harvesting or overcutting as a result of the intrinsic value of their by-products, fiber, or woody parts; a harvest permit is required. These 18 species and their respective Arizona Department of Agriculture (ADA) status are listed in Table 3.7-2.

Table 3.7-2. Arizona Native Plant Law Species Identified in the Project Area

Taxon	Common Name	ADA Status
<i>Agave mckelveyana</i>	McKelvey's century plant	SR
<i>Carnegiea gigantea</i>	Saguaro	SR
<i>Cylindropuntia acanthocarpa</i>	Buckhorn cholla	SR
<i>Cylindropuntia leptocaulis</i>	Christmas cactus	SR
<i>Dudleya saxosa</i> ssp. <i>Collomiae</i>	Rock live-forever	SR
<i>Echinocereus engelmannii</i>	Engelmann's hedgehog cactus	SR
<i>Ferocactus acanthodes</i>	Barrel cactus	SR
<i>Fouquieria splendens</i>	Ocotillo, coachwhip	SR
<i>Mammillaria grahamii</i>	Graham's nipple cactus	SR
<i>Mammillaria viridiflora</i>	Greenflower nipple cactus	SR
<i>Nolina bigelovii</i>	Bigelow's nolina	HR
<i>Nolina microcarpa</i>	Sacahuista	HR
<i>Opuntia basilaris</i>	Beavertail pricklypear	SR
<i>Opuntia chlorotica</i>	Dollarjoint pricklypear	SR
<i>Opuntia engelmannii</i>	Engelmann's prickly pear (cactus apple)	SR
<i>Opuntia phaeacantha</i>	Brown-spined or tulip pricklypear	SR
<i>Prosopis velutina</i>	Velvet mesquite	SA
<i>Yucca baccata</i>	Banana yucca	HR

Of these 18 species, 10 were counted in the transect surveys. A per-acre estimate for each of these plants is given in Table 6 of Appendix D. In addition, data on percent cover were provided for six ANPL species and provided in Table 7 of Appendix D. Appendix E provides a list of the ANPL species and the associated data.

Noxious and Invasive Weed Species

A total of three noxious and two invasive weed species, including Scarlet starglory redstar (*Ipomoea coccinea*), tall morning-glory (*I. purpurea*), little hogweed (*Portulaca oleracea*), buffaloburr nightshade (*Solanum rostratum*), and saltcedar (*Tamarix ramosissima*), was observed in the project area during the biological surveys described in Appendix D. Appendix F in the Appendix D in this EA contains a comprehensive list of species observed in the project areas during surveys. In addition, one additional invasive weed species, red brome (*Bromus rubens*), is known to occur in the analysis area.

Special Status Plant Species

One plant species, Arizona cliffrose (*Purshia subintegra*), is listed as endangered under the federal ESA for Yavapai County.¹ This species is found in limestone soils. It is unlikely to occur because there are no limestone soils in the project area that are suitable for the species. The nearest known location of the species is the Burro Creek population, approximately 7 miles from the project area (4 miles from the analysis area) at the BLM-designated Clay Hills Research Natural Area of Critical Environmental Concern (see Figure 3.7-1). Appendix H of the baseline biological report (see Appendix D) addresses the potential for occurrence of special status species, including those listed as federally Sensitive for the BLM Colorado River District, which includes the Kingman Field Office. However, none are expected to occur.

3.7.3 Environmental Consequences

Direct and indirect impacts to vegetation resources are described in the following sections.

Vegetation Communities

UPLAND VEGETATION COMMUNITIES

The Proposed Actions would involve the removal of approximately 522 acres of vegetation during project activities, resulting in the site-specific loss of vegetation communities. A total of 392 acres of interior chaparral and 130 acres of disclimax desert grassland would be permanently lost. The primary impacts to vegetation during construction and operation of the proposed project would be the removal and/or crushing of natural, native-species dominated vegetation communities from construction of access roads and the stockpile extension. Indirect impacts could include decreased plant productivity from fugitive dust and plant community fragmentation, as well as changes to community composition from the introduction and spread of noxious and invasive weeds.

Within the stockpile extension footprint and the access road footprint, this loss of plant communities would be long term and site specific. However, the vegetation communities that would be impacted are common throughout the analysis area, and the area of disturbance would be a small portion of that area. Furthermore, as stated in the MPO Modification, the flat tops and benches of the stockpile (which represent approximately 49% of the conceptual stockpile design) would be treated with Gila conglomerate soil cover material, which is the parent material for many desert shrub environments throughout the Southwest and also provides suitable characteristics for revegetation (i.e., the presence of clay and silt sized particles [for water retention], and larger rock particle sizes, which enhance erosional stability). The relatively steep side slopes between the benches would generally consist of large broken rocks (or talus); these slopes facilitate stormwater management and erosion control and thus would not be covered or revegetated.

These physical properties promote soil moisture retention and provide water storage at the root zone for enhanced vegetative growth. A reclamation plan for the stockpile extension project area will be developed in the future as mine closure approaches, and a seed mix would be developed at that time and approved by the BLM. For the APS project area, the disturbed areas outside the roadbed on the proposed APS ROW would be re-seeded with native plant species, as specified in Appendix F, thus providing an opportunity for vegetation to return to both project areas.

¹ Endangered. Endangered species are those in imminent jeopardy of extinction. The ESA specifically prohibits the take of a species listed as endangered. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

RIPARIAN VEGETATION COMMUNITIES

Riparian habitat within the project area is limited to six areas: stock tank, spring collector tank/cattle box, potential rock outcrop seep, potential seep, concrete spring box, and windmill-fed aboveground metal tank (see Figure 3.7-1). All areas have minimal riparian vegetation, and some no longer retain water (see Table 2 in the baseline biological report in Appendix D). Of these areas, all would be permanently lost by being covered over with waste rock in the stockpile project area, except the windmill tank, since FMBI will avoid disturbance to this feature. In addition, six ephemeral drainages are located within the stockpile extension project area that would be lost by covering over with waste rock. Vegetation associated with these drainages can be considered xeroriparian vegetation, which is usually the same composition as the uplands but in greater densities and larger growth form. Mountain Spring is not within the project area but is within the analysis area; however, no impacts to Mountain Spring's riparian vegetation are anticipated. Similarly, areas mapped as containing riparian vegetation communities are present within the analysis area; however, impacts to these areas are not anticipated (see Figure 3.7-1).

Arizona Native Plant Law

A total of 18 species listed under the ANPL was observed in the project area during biological surveys (see Appendix F in Appendix D of this EA). Implementation of the FMBI Proposed Action would result in the destruction of approximately 220,000 ANPL-protected plants (see Table E-1 in Appendix E of this EA). However, the implementation of mitigation would allow the opportunity for those species to be salvaged in the stockpile extension project area and potentially reduce the number of plants destroyed. For the APS project area, the BLM-recommended mitigation measure to transplant ANPL species would salvage these species from destruction.

Noxious and Invasive Weed Species

The implementation of the proposed project could result in site-specific, minor, long-term, direct and indirect impacts to vegetation communities due to the increased chance of noxious and invasive weed species introduction and establishment. This impact could alter the vegetative composition and increase the risk of wildfire due to increased fuel loads. These potential impacts would be greatest around the perimeter of the stockpile extension area and access roads and would decrease with distance from the project areas. Mitigation measures to avoid transferring weed propagules to or from the site would reduce the potential for spread of noxious and invasive weed species. In addition, the Gila conglomerate soil cover material that will be applied to the stockpile, as stated in the MPO Modification, does not have a high potential to harbor noxious weed seed, which would reduce the risk of weed introduction by use of this cover material type.

Special Status Plant Species

No limestone soils suitable for Arizona cliffrose are found in the project area. The nearest known species location is approximately 7 miles from the project area. Given the lack of suitable soils and distance to the nearest known species' occurrence, the proposed stockpile extension and APS access roads would have no effect on Arizona cliffrose.

Mitigation Measures

As part of the applicant-committed environmental protection measures described in Chapter 2, a reclamation plan for the stockpile extension project area will be developed in the future as mine closure approaches, and a seed mix would be developed at that time and approved by the BLM. In addition, applicant-committed environmental protection measures for the APS project area will include:

1) vehicle movement would be restricted to designated areas; 2) construction limits would be predefined and confined to those limits; 3) where possible, vegetation would be avoided to avoid excessive root damage and to allow resprouting; 4) construction personnel would be instructed on the protection of ecological resources; 5) hazardous materials and trash would be contained; and 6) monitoring during construction for special status species would be conducted. Furthermore, the few saguaros located in the boulder area of southern portion of the stockpile extension project area will be preserved in place.

Disturbed areas associated with either FMBI or APS activities that are not needed for long-term access and/or maintenance will be hydromulched and seeded with native plant species.

As presented in the MPO Modification, reclamation and closure of the stockpile and proposed stockpile extension would include:

- strategically regrading and contouring of the facility to control and divert surface water runoff from the stockpile in order to minimize erosion and infiltration;
- covering the flat top surfaces and benches of the facility to limit precipitation infiltration and enhance revegetation;
- revegetating the covered surface to control erosion and minimize infiltration;
- constructing surface water run-off control and diversions channels with provision of appropriate erosion protection within the channels; and
- maintaining and constructing underdrains for stormwater management.

ARIZONA NATIVE PLANT LAW

FMBI agrees to follow the protocol provided in Arizona Revised Statute 3-904 and Arizona Administrative Code Title 3, Chapter 3, Article 11, to allow salvage by outside entities. The area considered for salvage would include undisturbed areas of the proposed stockpile extension excepting a 500-foot buffer extending from the active toe of the stockpile. Salvage operators/permit holders would be required to contact FMBI prior to site entry. Cross-country travel by motorized vehicles would be permissible within the salvage footprint for the purpose of plant salvage. The BLM would fence certain areas to be avoided during plant salvage for resource concerns.

FMBI would prepare an NOI annually until the disturbance of new ground surface for the proposed stockpile extension is complete or until the disturbance of new ground surface is within 500 feet of the conceptual extent of the stockpile extension (i.e., the planned stockpile footprint, as defined in the MPO Modification).

NOXIOUS AND INVASIVE WEED SPECIES

An FMBI applicant-committed environmental protection measure for the stockpile project area, as stated in the MPO, that would reduce the risk of weed introduction is that Gila conglomerate soil cover material will be applied to the stockpile during reclamation/closure of the facility. Gila conglomerate soil cover does not have a high potential to harbor noxious weed seed. In addition, applicant-committed environmental protection measures for the APS project area would include using seeds that have been certified as weed free by the ADA.

Vehicles and equipment operating in the FMBI and APS project areas that have been in other locations and may carry weed seed material would be washed at a location off-site prior to and upon completion of access road construction to minimize the potential to spread noxious and/or invasive weeds to and from the project areas.

Cumulative Impacts

Past and present projects in the analysis area for cumulative impacts are provided in Section 3.3. No other past, present, or reasonable foreseeable future projects are found within the analysis area for cumulative impacts. Adverse impacts from the past and present actions, the proposed Bagdad Mine stockpile extension and APS access roads, and the approximately 522 acres of vegetation removal, which includes approximately 220,000 cacti and succulents to be removed, would constitute a cumulative impact to vegetation resources in the project area. The mitigation measures proposed for the project will, to some extent, minimize this impact. Any future project in and around the Bagdad Mine on state or federal land will be subject to similar state and federal laws and regulations, which require avoidance or mitigation of adverse effects and could also contribute to cumulative impacts.

3.8 WILDLIFE RESOURCES

3.8.1 Resource Issues and Indicators for Analysis

The resource issues identified during scoping related to wildlife resources that were carried forward for analysis are presented in Table 1.7-4 in Chapter 1. General resources issues related to wildlife resources include the following:

- Loss of habitat, including foraging areas, bat roosts, burrows, cavities, shelter sites, nests, etc.
- Degradation of habitat from noise, light, soil erosion, dust, changes in surface water quantity or surface water quality, and introduction of invasive plant species.

Using the indicators listed above, each category for each phase of the proposed projects (construction and operation and maintenance) would be analyzed as to how wildlife could be impacted by the proposed projects (e.g., change through time).

3.8.2 Affected Environment

Analysis Area

Section 3.2 describes the general requirements used for defining resource-specific analysis areas. The analysis area for assessing potential impacts on wildlife resources includes the footprint of the stockpile extension project area, the APS project area, and a 3-mile radius from those areas (see Figure 3.7-1). This analysis area was chosen in order to capture any potential project-related indirect effects on wildlife resources outside the project area. Potential indirect effects could include noise, light, soil erosion, dust, changes in surface water quantity or surface water quality, and invasive plant species introduction. However, not all of these potential indirect impacts are expected to occur; instead, this was the basis of the analysis.²

² There will be inevitable inconsistencies between the Biology Report (Appendix D) and the EA because the analysis area for each is different. For example, the EA analysis area includes the Proposed Action Areas plus a 3-mile buffer; thus, the EA analysis area captures more areas where species could occur and could be impacted. Therefore, the occurrence and impact inconsistencies are acceptable.

General Wildlife

General wildlife present in the project area is typical of those species that use the vegetation communities found in the project area. A list of all general wildlife observed in the project area during site surveys can be found in Table 8 of Appendix D.

Game Species

The stockpile extension and APS power line access roads would occur within the AGFD Game Management Unit (GMU) 18B. Of the 12 game species listed for GMU 18B, six species are known to occur in the project areas and/or analysis area, including bighorn sheep (*Ovis canadensis*), Gambel's quail (*Callipepla gambelii*), javelina (*Pecari tajacu*), cottontail (*Sylvilagus* sp.), dove (*Columbina* sp. and *Zenaida* sp.), and mule deer (*Odocoileus hemionus*). In addition, four GMU 18B games species may occur in the project areas and/or analysis area: waterfowl (various species), jackrabbit (*Lepus* sp.) American pronghorn (*Antilocapra americana* ssp. *americana*), and mountain lion (*Puma concolor*) (AGFD 2015). According to the Arizona Heritage Geographic Information System (AZHGIS) (Appendix C of the baseline biological report in Appendix D), Species of Economic and Recreation Importance with modeled habitat in the project areas and analysis area includes five of the games species listed above: American pronghorn, Gambel's quail, mule deer, javelina, and mountain lion. Similarly, black bear (*Ursus americanus*) is also likely to occur in this region and is also a game species. Potential for occurrence and habitat requirements for game species are given in Table 11 of Appendix D.

Special Status Wildlife Species

SPECIES LISTED UNDER THE ENDANGERED SPECIES ACT

A total of 18 species is listed as endangered, threatened, non-essential experimental populations, or proposed threatened under the Endangered Species Act in Yavapai County.^{3,4} One of these species, Arizona cliffrose, is addressed above in Section 3.7, Vegetation Resources. Of the 17 wildlife species, two have the potential to occur in the analysis area, including southwestern willow flycatcher (*Empidonax traillii extimus*) and yellow-billed cuckoo (*Coccyzus americanus*). For the remaining 15 species, the project area is clearly beyond the known geographic or elevational range of these species or it does not contain vegetation or landscape features known to support these species, or both. Habitat requirements, potential for occurrence, and possible effects of the project on these 17 wildlife species are summarized in Appendix D.

There is limited riparian vegetation within the stockpile extension area and also within the analysis area that could be used as suitable migratory and dispersal habitat for southwestern willow flycatcher and

³ Endangered. Endangered species are those in imminent jeopardy of extinction. The ESA specifically prohibits the take of a species listed as endangered. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

Non-essential Experimental Population (NEP). Experimental populations of a species designated under Section 10(j) of the ESA for which the USFWS, through the best available information, believes is not essential for the continued existence of the species. Regulatory restrictions are considerably reduced under an NEP designation.

Proposed Threatened: Proposed threatened species are those that are not currently federally protected under the ESA but are eligible to be listed as threatened under the ESA.

Threatened. Threatened species are those in imminent jeopardy of becoming endangered. The ESA prohibits the take of a species listed as threatened under Section 4d of the ESA. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

⁴ Since the initial Information for Planning and Conservation (IPaC) search was done for this project, the USFWS has published notices in the *Federal Register* removing the Sonoran desert tortoise and the Page springsnail from the list of candidate species under the ESA. In addition, the headwater chub and roundtail chub were elevated from candidates to proposed threatened since the IPaC was last accessed. Lastly, any species not addressed in Appendix D but included on the IPaC list is because those species are not listed in Yavapai County under the ESA. Thus, it was considered an IPaC error.

yellow-billed cuckoo. A description of riparian areas is provided in Section 3.2.10 of Appendix D. During migration, the southwestern willow flycatcher is known to use a wider array of forest and shrub habitats than they do for breeding, although riparian vegetation may still be a preferred migration habitat type (Finch et al. 2000). Although the southwestern willow flycatcher have been found in narrow, linear riparian habitats less than 33 feet wide during migration, they have never been found to be nesting in those areas (Sogge et al. 1997). Therefore, while these areas may not be used by these species on a regular basis, the possibility that the riparian habitats present in the project area and analysis area could be used as stopover and migratory habitat cannot be eliminated.

No proposed or designated critical habitat for species listed under the ESA occurs within the analysis area; distances to critical habitat are provided in Appendix D. The project areas and analysis area do occur within a 10(j) area established for a non-essential, experimental population of the Mexican gray wolf (*Canis lupus baileyi*). However, the reintroductions for this species are far from the analysis area; thus, this species is not likely to occur.

BLM Sensitive Species

Of the 44 species listed as Sensitive for the BLM Colorado River District, which includes the Kingman Field Office, 21 were identified as having the potential to occur because the proposed projects would occur within their range, and habitat parameters would be present. These species and their habitat descriptions are given in Appendix H of the baseline biological report (see Appendix D of this EA). The AZHGIS (2015) report (see Appendix C in Appendix D of this EA) indicated that there are records for two of these species within 5 miles of the project area: golden eagle (*Aquila chrysaetos*) and lowland leopard frog (*Lithobates yavapaiensis*). Golden eagle is addressed below under the Bald and Golden Eagle Protection Act. No open shafts or adits, i.e., potential bat roosts, are present in the project areas, but three open adits/shafts that could be potential bat roosts are located within the analysis area.

Sonoran desert tortoise (*Gopherus morafkai*) habitat, designated as BLM Desert Tortoise Category III Habitat, is present in the project areas (522 acres total) and the analysis area (24,066.9 acres) (Figure 3.8-1). In addition, there are 2,828.3 acres of Category II Habitat in the analysis area, located approximately 1.0 miles and 1.3 miles from the stockpile extension and APS access roads project areas, respectively. The Poachie Desert Tortoise Area of Critical Environmental Concern is located approximately 3.75 miles from the nearest project component (see Figure 3.8-1). There were no observations of tortoises during focused surveys conducted for the baseline biological report. Results of the AZHGIS search indicated that there are records of desert tortoise within 5 miles of the project area (see Appendix C in baseline biological report in Appendix D of this EA). With suitable habitat present and records of desert tortoises in the vicinity, it is possible that the project area could be used as dispersal habitat.

AGFD Species of Greatest Conservation Need

A total of 51 Species of Greatest Conservation Need (SGCN) was identified by the AZHGIS (2015) as predicted to occur within 5 miles of the project areas based on the AZHGIS modeled habitats within the project area and vicinity (see Appendix C in the baseline biological report in Appendix D of this EA). Of these 51 species, 40 may occur in the project and/or analysis areas where habitat for breeding, foraging, sheltering, dispersing, and/or migratory activities may be present. For the remaining 11 species, the project area is clearly beyond the known geographic or elevational range of these species or it does not contain vegetation or landscape features known to support these species, or both. Potential for occurrence for each species is discussed in Section 3.4.2 of the baseline biological report in Appendix D.

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Migratory Bird Treaty Act

A total of 17 bird species was observed in the project area during surveys. A list of these species is included in Table 8 of Appendix D. In addition, a potential raptor nest, a utility pole with a nest, and a bird nest were observed during the baseline biological surveys. All species observed during surveys are protected under the Migratory Bird Treaty Act. Both the project area and analysis area contain habitat suitable for nesting by migratory birds.

AZHGIS indicated that 18 migratory bird species that are also SGCN would be expected to occur within 5 miles of the project areas based on modeled habitat parameters. A list of these bird species is included in Appendix C of the baseline biological report in Appendix D of this EA.

Bald and Golden Eagle Protection Act

Within 10 miles of the project area, there are areas with slopes greater than 50 degrees that could be nesting habitat for golden eagles. Within the stockpile extension project area and the APS access road project area, there are no slopes suitable for nesting by golden eagles. Within the analysis area, there is approximately 17.5 acres with slopes greater than 50 degrees. Outside the analysis area but within 10 miles, there is approximately 281.9 acres with slopes over 50 degrees. This is a total of 299.4 acres within 10 miles of the project area that could be suitable for golden eagle nests. The nearest slopes over 50 degrees (not including the existing mine pit) are approximately 4 miles northwest from the project area. Given the amount of area with suitable slopes, it is possible that golden eagles may nest within 10 miles of the stockpile extension project area and APS access road project area. As such, the project and analysis area could be used by the species for foraging.

The project area and analysis area do not provide suitable breeding, foraging, or wintering habitat for the bald eagle (*Haliaeetus leucocephalus*). The nearest suitable breeding, foraging, and wintering habitat is located over 6 miles north of the project area at Burro Creek.

Wildlife Connectivity/Wildlife Movement Corridors

There are no wildlife movement areas within the stockpile extension project area or the APS access road project area. There is one riparian movement area in the analysis area. It is the Alamo Lake–Big Sandy River–Burro Creek–Santa Maria River riparian/wash movement area, which overlaps the analysis area on approximately 209.3 acres (see Figure 3.8-1). Species likely to use this corridor include species that are riparian obligates (AGFD 2013). Riparian obligates are species that require streams or riparian areas for some portion of their life cycle.

3.8.3 Environmental Consequences

Direct and indirect impacts to wildlife resources are described in the following sections.

Impacts Common to All

Potential project-related impacts on general wildlife and special status species would include noise disturbance; permanent and temporary displacement; habitat loss, degradation, and fragmentation; and individual mortality.

Noise and vibration associated with project activities may change habitat use patterns for some individuals. Some individuals would move away from the source(s) of the noise/vibration to adjacent or

nearby habitats, which may increase competition for resources within these areas. Noise/vibration and other disturbances may also lead to increased stress on individuals, which could decrease their overall fitness due to increased metabolic expenditures. Noise impacts would be limited to those sounds that are above the estimated existing background levels (60 decibels [dB]), which would be within approximately 1,475 feet of the project area boundary.

Approximately 522 acres of habitat, including foraging areas, burrows, cavities, shelter sites, and nests, for these species would be permanently lost to development. However, the project-related impacts are not likely to have population-level effects on species that are expected to occur within the project areas.

GENERAL WILDLIFE

Potential project-related impacts on general wildlife would include those described above as well as individual mortality. These impacts would be site specific, minor, and long term. Individual mortality could occur through collisions with and crushing by vehicles and equipment, entombment of animals in burrows, destruction of foraging areas, cavities, shelter sites, and nests in areas where ground disturbance would occur.

Impacts to wildlife habitat would occur on approximately 520 acres for the stockpile extension, 1.4 acres for the APS access roads, and 1.0 acre for the FMBI monitoring well pads and access roads, for a total disturbance of approximately 522.4 acres. This would be approximately 2% of the 26,896 acres of general wildlife habitat in the analysis area. Based on the amount of available habitat in the analysis area, the proposed projects may impact individuals but are not anticipated to considerably impact general wildlife populations.

GAME SPECIES

Potential impacts on game species would be as described above in Impacts Common to All and would be site specific, minor, and long term. The stockpile extension project and APS access road project would remove approximately 522 acres of habitat for game species. Potential impacts for each game species (i.e., javelina, bighorn sheep (*Ovis canadensis*), mule deer, American pronghorn, Gambel's quail, waterfowl, and mountain lion) potentially occurring in the project area are addressed in Table E-4 in Appendix E.

Mitigation Measures

As part of the applicant-committed environmental protection measures described in Chapter 2, a reclamation plan for the stockpile extension project area will be developed in the future as mine closure approaches; a seed mix will be developed at that time and approved by the BLM. See the Vegetation Resources section for a general description of the reclamation plan. In addition, applicant-committed environmental protection measures for the APS project area will include the following: 1) vehicle movement would be restricted to designated areas; 2) construction limits would be predefined and confined to those limits; 3) where possible, vegetation would be avoided to avoid excessive root damage and to allow resprouting; 4) construction personnel would be instructed on the protection of ecological resources; 5) hazardous materials and trash would be contained; and 6) monitoring during construction for special status species would be performed.

As a BLM-recommended mitigation measure, the disturbed areas outside the roadbed on the proposed APS ROW would be hydromulched and seeded with native plant species (see Appendix F for seed mix), thus providing an opportunity for habitat to return to both project areas in the long term.

SPECIAL STATUS SPECIES

It is a proponent-committed action that any Sonoran desert tortoises encountered during construction of the project will be handled in accordance with the AGFD Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects (Appendix H). A qualified biologist will provide training to personnel regarding the guidelines for handling desert tortoise prior to disturbance.

Also in accordance with BLM Arizona State Office Instruction Memorandum No. AZ-2012-031, compensation for the loss of desert tortoise habitat would be required. Should the project be approved, Freeport-McMoRan has offered 450 acres of Category III tortoise habitat, within the Kingman Field Office, to the BLM. This would replace the tortoise habitat that would be lost with the expansion of the stockpile.

When nesting bird surveys are conducted (discussed below under Migratory Bird Treaty Act), any Gila monsters that are encountered would be removed and relocated outside the project area.

MIGRATORY BIRD TREATY ACT

FMBI will conduct nesting bird surveys prior to new ground disturbance that occurs between March 1 and September 30 within the footprint of the proposed stockpile extension. Areas slated for new ground disturbance plus a 150-foot buffer will be surveyed within 2 weeks of the scheduled disturbance during this season. If nests are identified, FMBI will coordinate with a qualified biologist to either move the nest or identify an area to avoid disturbance to active nests until fledging occurs using a buffer by type of bird: 100-foot buffer for ground/burrow nesters; 1,200-foot buffer for raptors; and 50-foot buffer for other species.

Wildlife Connectivity/Wildlife Movement Corridors

The only wildlife movement area is within the analysis area, not the project area, and is utilized by riparian obligates. Impacts to the Alamo Lake–Big Sandy River–Burro Creek–Santa Maria River riparian/wash movement area or riparian obligates are not expected as a result of the proposed Bagdad Mine stockpile extension and APS access roads actions.

Cumulative Impacts

Past and present projects in the analysis area for cumulative impacts are provided in Section 3.3. No other past, present, or reasonable foreseeable future projects are found within the analysis area for cumulative impacts. Adverse impacts from the past and present actions, the proposed Bagdad Mine stockpile extension and APS access roads, and the 522 acres of habitat for those special status species identified as potentially occurring within the project area would constitute a cumulative impact to wildlife habitat in the project area. The mitigation measures proposed for the project will, to some extent, minimize this impact. Any future project in and around the Bagdad Mine on state or federal land will be subject to similar state and federal laws and regulations, which require avoidance or mitigation of adverse effects and could also contribute to cumulative impacts.

3.9 CULTURAL RESOURCES

The proposed Bagdad Mine stockpile extension and APS ROW amendment are subject to a number of laws, regulations, and/or policies implemented by the federal government, including NEPA and FLPMA (43 USC 1701–1784). Other relevant laws, ordinances, EOs, policies, and agreements include the

American Antiquities Act of 1906 (16 USC 431–433); NHPA of 1966 (54 USC 300101 *et seq.*); EO 11593 (May 13, 1971), Protection and Enhancement of the Cultural Environment; American Indian Religious Freedom Act of 1978 (42 USC 1996); Archaeological Resources Protection Act of 1979 (16 USC 470aa–470mm); Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001–3013); and EO 13007 (May 24, 1996), Indian Sacred Sites. Most pertinent to the proposed Bagdad Mine stockpile extension and APS ROW amendment is Section 106 of the NHPA, which requires federal agencies to take into account the effects of their undertakings on historic properties. Historic properties are defined in 36 CFR 800.16(l) as any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP).

3.9.1 Resource Issues and Indicators for Analysis

Resource issues identified during scoping and related to cultural resources (see Table 1.7-4) carried forward for analysis include the following:

- How will tribes and the Bureau of Indian Affairs be consulted in the NEPA process, including the Hopi Tribe of Arizona, Hualapai Tribe of the Hualapai Indian Reservation, Colorado River Indian Tribes of the Colorado River Indian Reservation, Yavapai-Apache Nation of the Camp Verde Indian Reservation, and the Yavapai-Prescott Indian Tribe of Yavapai-Prescott Indian Reservation?
- How would the Proposed Actions and alternatives affect the area's cultural resources, and how will the area be surveyed for identifying cultural resources?
- How will the NRHP-eligible site within the footprint of the stockpile be affected?
- How will the Proposed Actions affect areas of interest identified by consulted Tribes?

The indicators used to analyze these issues are as follows:

- Any disturbance that may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association, due to the extension of the stockpile, construction of monitoring well pads and access roads, and construction of proposed access roads.

Analysis indicators consist of the disturbance to or loss of historic properties resulting from the proposed stockpile extension, monitoring well pads and access roads, or the planned access roads in the additional APS ROW, and any visual or auditory impacts to historic properties by the stockpile extension or the planned access roads in the additional APS ROW.

3.9.2 Affected Environment

The analysis area for cultural resources for the proposed Bagdad Mine stockpile extension and APS ROW amendment for direct impacts consists of the footprint of the proposed stockpile, the monitoring well pads and access roads, and the additional APS ROW. For indirect/visual impacts, the analysis area consists of a 5-mile buffer around the APE for direct impacts that corresponds to BLM's foreground-middle ground (less than 3 miles to 5 miles away) for visual analysis (BLM 1986).

Archaeological Sites

A Class III pedestrian survey was conducted of the Proposed Action project area (Kirvan et al. 2013). A total of 1,273 acres was surveyed, which encompasses the proposed 520-acre stockpile, the monitoring

well pads and access roads, and the 3,700-foot-long × 80-foot-wide ROW for APS. Twelve sites were recorded within the project area for the proposed stockpile extension, well pads and access roads, and APS ROW during the survey. Ten were determined not eligible for the NRHP by the BLM, and two were determined eligible for the NRHP under Criterion D, which refers to those sites, artifacts, etc., that have yielded or may be likely to yield information important in history or prehistory.

In addition, to evaluate indirect/visual effects that may be caused by the proposed stockpile expansion, archaeologists searched the AZSITE online database for the presence of NRHP-eligible historic properties for which setting is an important characteristic. Generally, when setting is the characteristic that conveys NRHP significance, the historic property is eligible under Criterion A (association with an historic event or trend) or Criterion C (being the embodiment of a distinct type, period, or method of construction). A search of a 5-mile radius surrounding the project area yielded no historic properties that meet these criteria.

Native American Concerns

In addition to the archaeological sites, government-to-government consultation has revealed other areas important to local tribes. Resources that may be impacted from the implementation of the proposed actions are under consideration in the HPTPs that are currently being developed.

3.9.3 Environmental Consequences

Proposed Bagdad Mine Stockpile Extension

The proposed stockpile extension would adversely and directly impact one NRHP-eligible site. Impacts to the site would require additional mitigation measures as required for Section 106 compliance. As planned, the stockpile extension would disturb and/or prevent access to the information about the past contained in the site. Impacts to the site would be major and long term. The proposed stockpile extension would also impact all of the 10 not-eligible sites.

Indirect impacts of the proposed stockpile extension consist of adverse impacts to the setting of the site of tribal importance. The stockpile is planned to reach 1,200 feet above the modern ground surface, which will be visible from this site (see Section 3.11, Visual Resources). However, the growth of the stockpile would occur over several decades and may not be visible for a number of years. Impacts to the site of tribal importance would be long term and minor as the stockpile extension reached its full height.

Proposed 115-kV Power Line Access Roads

The proposed APS ROW amendment would directly and adversely impact one NRHP-eligible site. Direct impacts to the site would be minor and long term. Indirect impacts from the newly constructed roads may also arise from increased accessibility. The roads will facilitate access for non-APS personnel; however, the presence of the stockpile extension may deter additional visitors to the general area. Indirect impacts would be long term but minor.

Indirect impacts to the site of tribal importance may occur if the roads are improved by changing the setting through increased noise and vehicular and equipment traffic during construction. Access to the site of tribal importance will not change due to the construction of the proposed roads. Impacts would be minor and short term.

Mitigation Measures

All agreed-upon mitigation will be outlined in Memoranda of Agreement (MOAs) and HPTPs, which are currently being developed in consultation with the State Historic Preservation Office (SHPO), FMBI, APS, and the Hualapai Tribe.

Cumulative Impacts

The cumulative impacts analysis area consists of a 10-mile radius around the project area. Following state and federal laws, adverse impacts from the proposed Bagdad Mine stockpile extension and APS ROW amendment will be minimized through mitigation and are not expected contribute to cumulative impacts to cultural resources. Past and present projects/activities in the analysis area for cumulative impacts consist of mineral exploration, extraction, and/or development, including the Bagdad Mine itself, BLM management activities, construction and maintenance of the APS power line, and multiple other public uses. Some of these projects, such as the APS power line, are known to have had a minor adverse impact to cultural resources, and other activities, such as public use, may have also inadvertently had an adverse impact to cultural resources. However, because a large portion of the cumulative analysis area is on state or federal land, the majority of these projects and/or activities would have been and are subject to state or federal laws that require avoidance or mitigation of adverse effects on cultural resources. Therefore, the past and present projects and activities would have made a minor contribution to cumulative effects. No reasonable foreseeable future projects are found within the analysis area for cumulative impacts. Any future project in and around the Bagdad Mine on state or federal land will be subject to state and federal laws and regulations that require avoidance or mitigation of adverse effects on historic properties and would not be expected contribute to cumulative impacts to cultural resources.

3.10 RECREATION RESOURCES / PUBLIC ACCESS

3.10.1 Resource Issues and Indicators for Analysis

Resource issues identified during scoping and related to recreation resources and public access (see Table 1.7-4) carried forward for analysis include the following:

- How would the Proposed Actions affect future access to private and recreational lands in the project area vicinity?
- What will the effect of the stockpile extension be on off-highway vehicle (OHV) routes used by recreationists?
- How will the stockpile extension affect dispersed recreation opportunities (e.g., hunting, camping, hiking, wildlife viewing) in the vicinity of the proposed stockpile?
- How will changes in surface water flow affect erosion of existing access routes?

The indicators used to analyze these issues are as follows:

- Acres of BLM-managed land (Kingman Field Office) that would be unavailable for recreational use.
- Miles of open-to-public-use BLM routes that would be changed or lost.
- Hunter-days lost (quantity based on number of permits available and number of days in season).

3.10.2 Affected Environment

The following section describes the baseline conditions of the affected environment for recreation resources and public access.

Public access, for the purposes of this EA, is defined as physical access routes that provide road, trail, or primitive road ingress or egress for an area. Public access routes are defined as roads, trails, or primitive roads that are open to public use. The project area contains only primitive roads and is absent roads or trails. Legal access (e.g., ROWs, claims, or easements) is discussed in Section 3.13, Land Use/Grazing. Recreation, as an activity and resource, provides users with opportunities, settings, and experiences that vary widely. Recreation activities are interrelated and connected to other natural resources and resource uses. Recreation resources in the vicinity of the proposed FMBI and APS projects include OHV use, (e.g., four-wheel drive passenger vehicles, modified four-wheel drive vehicles [e.g., rock-crawlers], motorcycles, four-wheelers, and utility terrain vehicles), camping, hiking, picnicking, photography, horseback riding, cycling (mountain), hunting, and wildlife viewing. Recreation activities include casual or dispersed uses; no competitive or organized group events currently take place within the proposed project area.

The analysis area for assessing direct, indirect, and cumulative impacts to recreation and public access is defined as the proposed stockpile extension area and the proposed APS power line access roads, totaling approximately 441 acres of BLM-managed land and 79 acres of FMBI-owned lands for the stockpile extension, as well as approximately 0.6 mile of APS access roads, totaling approximately 1.4 acres, and 1.0 acre of surface disturbance for the proposed FMBI monitoring well pads and access roads. The temporal bounds of analysis is the estimated life of development of the stockpile extension, from implementation to the completion of reclamation, which is assumed to be approximately 50 years.

As described in the Kingman RMP (BLM 1993), the physiographic province located between the Basin and Range and the Colorado Plateau physiographic provinces is known as the Transition Zone. The Transition Zone offers users a wide variety of topography, terrain, features, vegetation, scenic values, historic resources, wildlife, wilderness, and riparian resources. The project area lies within the Transition Zone, and though the existing Bagdad Mine presents a stark contrast to the surrounding landscape, recreation resource and public access opportunities are abundant in the surrounding area. Although no quantitative recreational use data exist for the project area, it is assumed that the primary recreational pursuits in the area include hunting and OHV use.

Recreation Resources

The Kingman RMP includes objectives for managing recreation resources. Namely, the objective of the recreation program is to ensure the continued availability of quality outdoor recreation opportunities and experiences that are not readily available from other sources. Recreation use is managed in order to protect the health and safety of visitors; to protect natural, cultural, and other resource values; to encourage public enjoyment of public land; and to resolve user conflicts (BLM 1993).

Critical to producing recreation opportunities is the condition of recreation settings on which those opportunities depend. The physical setting describes variations in components such as remoteness, naturalness, and facilities. The social setting reflects the variations in components such as group size, number and types of contact with other users, encounters between individuals or groups, and the evidence of use by others. The administrative setting reflects the variations in the kind and extent of components such as visitor services, management controls, user fees, and mechanized use.

The physical setting of the project area and vicinity can be characterized as developed, roaded open Sonoran Desert. The more than 100 years of mining activity at the adjacent Bagdad Mine has resulted in a lack of undeveloped and primitive recreation opportunities in the area. Because of the presence of the dirt roads throughout much of the area, the social setting can be characterized as well used; opportunities for solitude are low. Cross-country travel is not permitted in the proposed stockpile extension area; therefore, the administrative setting includes management prescriptions that require users to remain on existing roads, trails, and navigable washes. The overall recreation setting of the proposed stockpile extension area is the same throughout and does not vary. The nearest BLM-designated recreation site is Burro Creek Campground, over 14 miles to the west. The Upper Burro Creek Wilderness Area, 5 miles to the north, was federally designated in 1990 under the Arizona Desert Wilderness Act and facilitates recreational experiences consistent with wilderness characteristics (Figure 3.10-1).

Hunting

The proposed project area is wholly within GMU 18B, administered by the AGFD. At 777,080 acres, GMU 18B supports a wide variety of game species, such as pronghorn/antelope, black bear (*Ursus americanus*), elk (*Cervus elaphus*), javelina, mountain lion, desert bighorn sheep, mule deer, quail, waterfowl, dove, cottontail (*Sylvilagus* sp.), and jackrabbit (*Lepus* sp.).

The vicinity of the proposed stockpile extension area is primarily used to hunt javelina, mule deer, American pronghorn, and Gambel's quail. The other species are not present in the vicinity of the proposed stockpile extension area due to lack of habitat, topography, vegetation, elevation, and/or human activity. Table 3.10-1 provides available 2014 hunter success data for those small- and big-game species that occur within the proposed stockpile extension area within GMU 18B.

Table 3.10-1. 2014 Hunter Success for GMU 18B

Species*	Permits Issued	Hunter Days	Total Harvest
Mule deer	300	1,094	62
Javelina	450	1,239	136

* Harvest data are not available for quail, dove, cottontail, or jackrabbit.

Public Access

The proposed stockpile extension area is currently open to public use, subject to existing laws and regulations. To access the area via OHV, users are required to remain on existing roads, trails, and navigable washes. Approximately 2.07 miles of primitive roads traverse the proposed stockpile extension area (see inset map in Figure 3.10-1). Cross-country hiking is permitted. The area is not used to access either the BLM-designated recreation sites or wilderness area. To access Burro Creek via OHV, located approximately 6 miles west of the proposed stockpile extension area, users would traverse Burro Creek Crossing Road, located on the west side of U.S. Route 93, approximately 17 miles west of the proposed stockpile extension area.

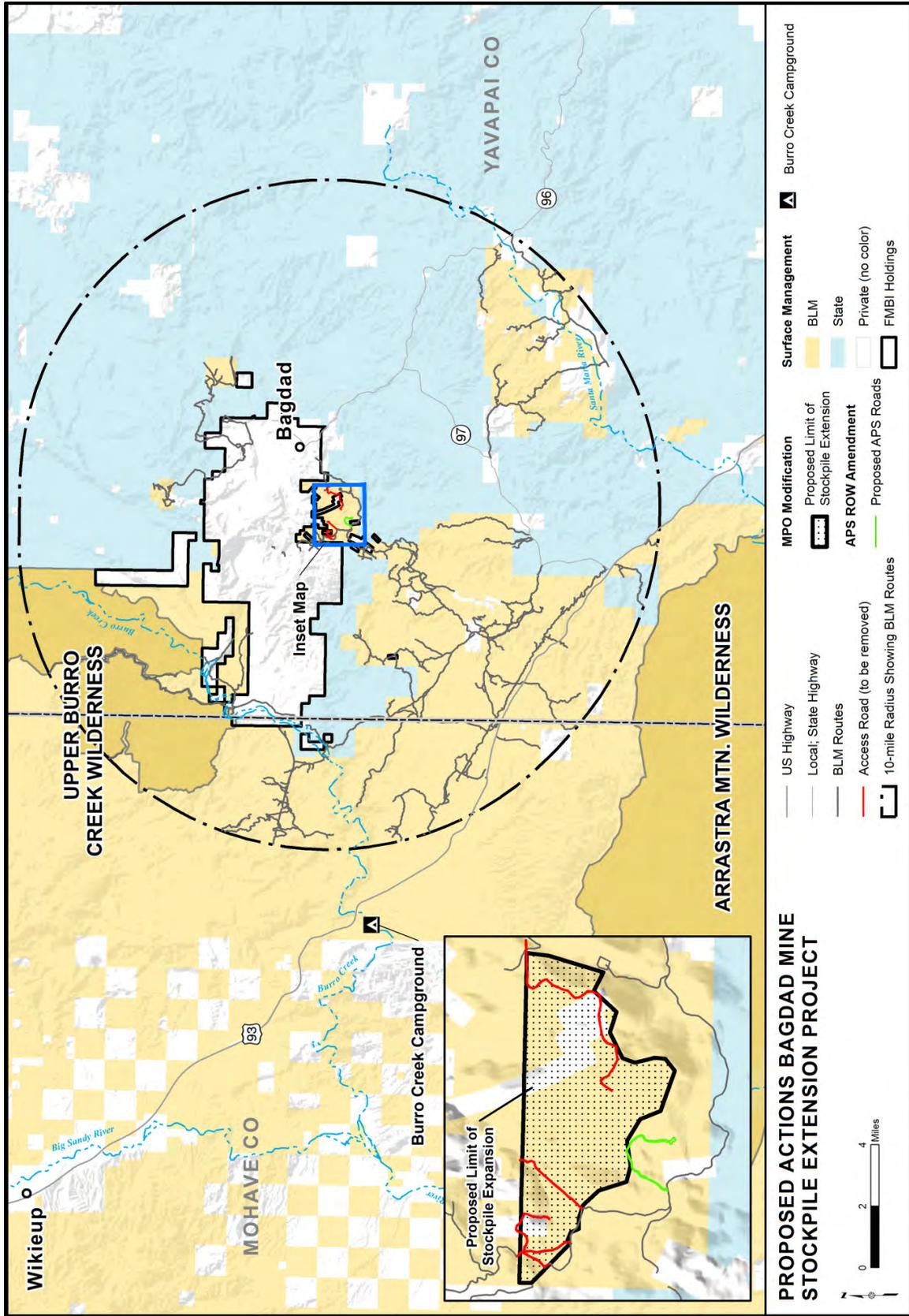


Figure 3.10-1. Recreation resources in the vicinity of the project area.

3.10.3 Environmental Consequences

Proposed Bagdad Mine Stockpile Extension

The proposed stockpile extension would change the recreation setting in the long term since it would convert the lands from developed, roaded, and open desert to a waste rock stockpile, which would require that it be closed to public use. Recreation experiences and opportunities (OHV use, camping, hiking, picnicking, photography, horseback riding, cycling, hunting, and wildlife viewing) would cease within the bounds of BLM-managed lands in the proposed stockpile extension area, an area of approximately 520 acres (including a 79-acre FMBI-owned inholding). Since the project area is currently used by a variety of individuals and recreation users, closure of the land to the public would result in these recreationists needing to use other adjacent areas that support their chosen activity. For example, OHV use is prevalent in the region within and surrounding the area; when access is restricted in the proposed stockpile extension area, OHV users would be displaced to adjacent areas that support a similar recreational opportunity.

The distance of this displacement is minimal because areas to the immediate east and south of the proposed stockpile extension area would continue to be available for recreation experiences and opportunities, and public access to these areas would continue. Although exact locations or levels of displaced use cannot be predicted without speculating, it is believed that shifting recreational use to adjacent areas due to the loss of access to the project area would not likely result in a noticeable increased use in other areas within the region. The impact to the existing recreation resources would be minor, but long-term.

The elimination of 441 acres of BLM lands available for hunting would not affect GMU 18B's overall ability to support small- and big-game hunting opportunities; no hunting permits or hunter days are anticipated to be reduced as a result of the proposed stockpile extension. The impact to hunting would be negligible. Public access to the 441 acres of BLM lands would be closed. This closure would not eliminate access to any BLM-designated recreation sites or wilderness area. The 2.07 miles of primitive roads within the project area would no longer be available for OHV use, permanently. However, these roads are generally used for casual OHV use and do not preclude east-west or north-south connectivity in the region. As described in the MPO Modification (and in Section 3.5, Water Resources), the proposed stockpile extension is designed in such a way that it fully contains any surface water flow from entering public access routes. The monitoring wells and associated access roads would be constructed in compliance with the MSGP, adhering to the SWPPP and employing BMPs to manage the potential for erosion. Therefore, no degradation of access roads (i.e., erosion) would occur as a result of the proposed stockpile extension. The impact to public access would be negligible.

Proposed 115-kV Power Line Access Roads

The proposed 115-kV power line access roads would result in minor changes to the recreation setting in the long term since it would create or improve 0.6 mile of access road in an area that does not currently have legal public access, and APS would operate and maintain the access roads for the life of the 115-kV power line. Though the proposed 115-kV power line access roads would add to the current available routes open for public use in the vicinity, they would not offset the 2.7 miles of access roads that would be closed to public use as a result of the proposed stockpile extension. Further, the 0.6 mile of new or improved access roads would not provide exclusive access to either BLM-designated recreation sites (or other land-managing agency recreation site) or wilderness area. Therefore, the addition of 0.6 mile of new or improved access roads would be a minor but long-term change to current public access.

Mitigation Measures

No mitigation measures for recreation resources and public access are recommended.

Cumulative Impacts

The geographic boundary for cumulative effects is the same as for direct and indirect effects. Past and present actions have contributed to the current recreation and public access conditions found within the project area (e.g., dispersed recreational use of public lands). Existing environmental conditions in the vicinity of the proposed stockpile extension area reflect changes brought about by long-term mining activity, occupancy, and use. Ongoing or planned activities that may contribute to cumulative impacts include nearby past mining activities, activities related to the APS transmission line ROW, and recreational activities.

The proposed project would result in extension of the existing stockpile onto 520 acres (441 acres of BLM lands and 79 acres of FMBI lands), construction on approximately 1.0 acre for the FMBI monitoring well pads and access roads, and construction or improvement of approximately 0.6 mile of access roads (totaling approximately 1.4 acres) in support of the APS 115-kV power line. This new disturbance of approximately 522.4 acres would result in a minor, long-term, cumulative impact to recreation resources and public access. The impact is considered minor because while the proposed stockpile extension would result in the lands in the project area being closed to future recreation use, it would not eliminate any BLM-designated recreation sites or recreation use in the adjacent areas; these areas would continue to be available for recreation. Further, the proposed project would not preclude east-west or north-south connectivity in the region. The 1.4 acres/0.6 mile of APS road segments that would be constructed would result in minor changes to public access; the impact would be minor but long term because these roads would remain open and available for public use.

No additional reasonably foreseeable future actions are known that would contribute to impacts to recreation resources and public access in the Bagdad area. Thus, the proposed project is not likely to affect any future public access.

3.11 VISUAL RESOURCES

3.11.1 Resource Issues and Indicators for Analysis

Resource issues identified during scoping and related to visual resources (see Table 1.7-4) carried forward for analysis include the following:

- How will BLM assess changes to the visual characteristics of the area?
- How do the RMP Visual Resource Management (VRM) objectives affect the Proposed Actions or alternatives?

The indicators used to analyze these issues are as follows:

- The level of visual contrast created by the proposed project
- Conformance with existing VRM Class objectives

3.11.2 Affected Environment

Landscape Character

The visual resources analysis area extends 7 miles from the project area and is located within the Central Highlands transition zone physiographic province, between the Colorado Plateau to the north and east and the Basin and Range to the south and west. In general, the area is characterized by rugged mountains, low rolling hills, lava-capped mesas, and narrow, deeply incised canyons found in the landscape surrounding the project area. The region is cut by the deep canyons of Boulder and Copper Creeks to the north and Burro Creek to the west. Elevations in the vicinity of the Bagdad Mine range from approximately 2,300 feet along Burro Creek to roughly 5,100 feet in the Grayback Mountains south of the mine. Dick Peak is located southwest of the project area and rises to an elevation of 4,144 feet. Slopes in the area range from the steepest at over 60% to average slopes that exceed 10%. The natural vegetation in the analysis area is made up of chaparral and disclimax grassland vegetation communities with pockets of the Sonoran Desert Arizona upland biotic community interspersed in lower elevations. Dominant plant species include Sonoran scrub oak, ceanothus (*Ceanothus* sp.), mountain mahogany (*Cercocarpus* sp.), Engelmann's prickly pear (*Opuntia engelmannii*), and forbs, including fairy duster (*Calliandra eriophylla*) and snakeweed. There are areas of saguaro and ocotillo as well as riparian vegetation located along the analysis area's perennial streams and around springs and seeps. The Upper Burro Creek Wilderness Area is located approximately 5 miles to the north of the stockpile extension area; it lies along and contains the upper reaches of Burro Creek. Away from the stream corridor, the wilderness contains basalt mesas with desert grassland on their rolling upland surfaces.

Existing development in the analysis area includes the community of Bagdad, Arizona, the Bagdad Mine, and ranching properties. The Bagdad community consists of typical suburban residential housing development with interspersed commercial and community facilities. Existing mining operations have modified the natural scenery. View of the current Bagdad Mine operations and facilities include views of the existing waste rock stockpiles from the Bagdad community and portions of the Bruce Mine Road. The Kellis Ranch, located off of the Bruce Mine Road, is the closest residence to the Proposed Actions (approximately 0.6 mile), apart from the Bagdad community.

Management Framework

Visual resources on BLM-administered lands are managed in accordance with the VRM System (BLM 1986).

The Bagdad Mine stockpile extension and APS access roads project areas are located within lands managed as VRM Class IV Objectives (Figure 3.11-1) as determined in the Kingman RMP (BLM 1993).

The VRM Class objective is as follows:

- **VRM Class IV Objective** (Modification of the landscape character) includes areas where changes may subordinate the original composition and character. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements of the landscape.

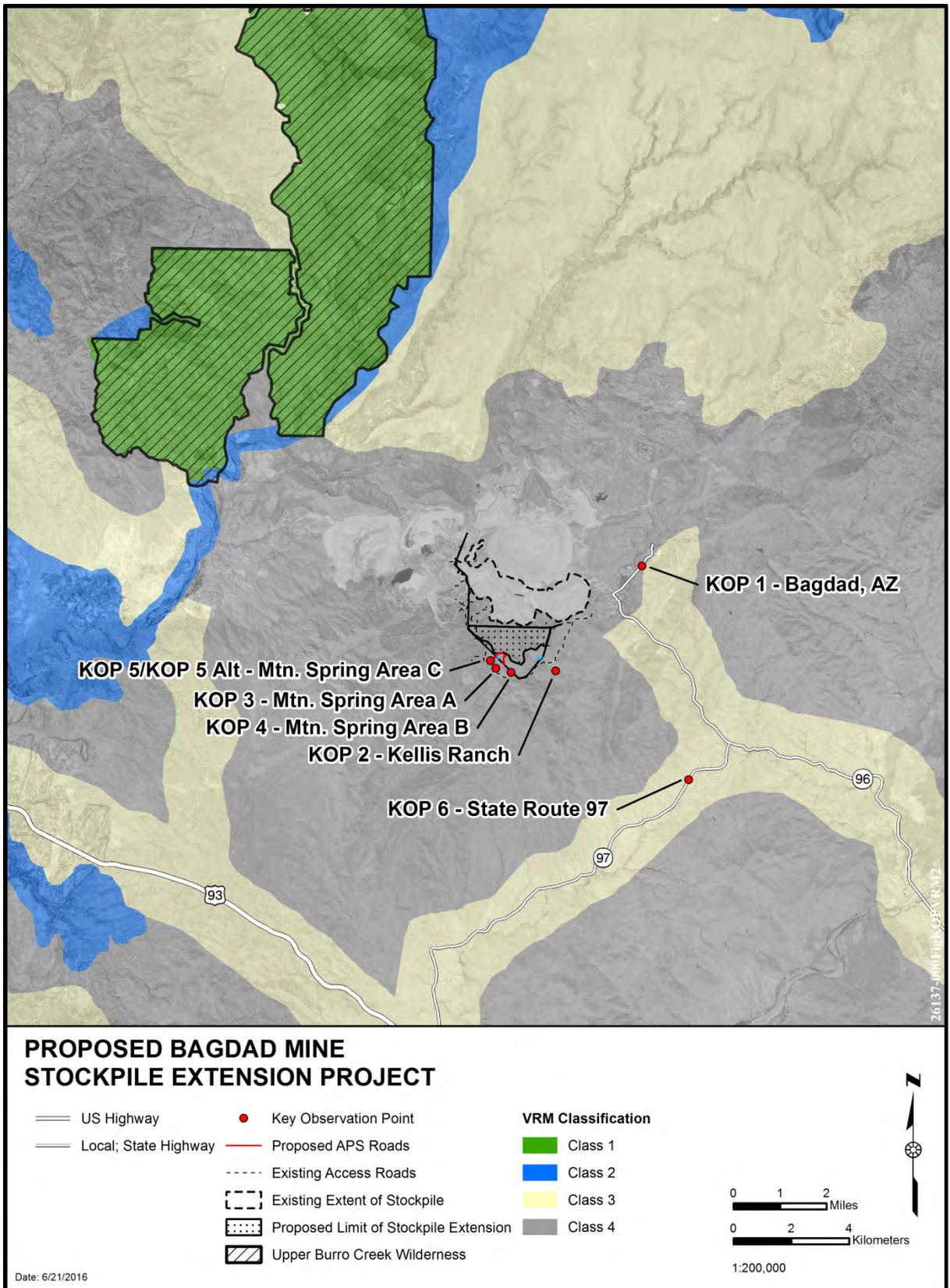


Figure 3.11-1. VRM classification of the visual resources analysis area.

3.11.3 Environmental Consequences

Viewshed Analysis

A viewshed of the analysis area was created using a geographic information system (GIS) three-dimensional (3D) model of the proposed stockpile extension and surrounding landscape to analyze visibility of the stockpile. By locating multiple viewpoints on the top of the proposed stockpile extension and looking out at the surrounding landscape, the resulting “seen area” or viewshed represents the area from which the stockpile extension theoretically could be visible (Figure 3.11-2). This theoretical view is based on elevation and landform and does not account for vegetation, structures, and other landscape elements that could obstruct views. Using the viewshed analysis and reviewing the activities occurring in this remote area, a 7-mile resource analysis area was determined adequate to capture potential visual impacts from stockpile viewpoints. The viewshed analysis was used to assist in identification of Key Observation Points (KOPs) that represent common or sensitive points from which the stockpile extension could be viewed. The six KOPs identified for further analysis are shown in Figure 3.11-2.

BLM Contrast Rating Process

The Visual Resource Contrast Rating System is a project-level planning and analysis tool used for assessing project visual impacts. The tool compares proposed project features with the major features in the existing landscape to determine whether the project will meet the VRM Class Objectives.

The visual resource analysis was conducted from six KOPs (see Figure 3.11-1) representing common or sensitive views of the Proposed Actions (the stockpile extension and the APS access roads):

- KOP 1 – Bagdad, Arizona
- KOP 2 – Kellis Ranch
- KOP 3 – Mountain Spring Area A, Bruce Mine Road
- KOP 4 – Mountain Spring Area B
- KOP 5 – Mountain Spring Area C
- KOP 5 Alternate – Mountain Spring Area C, Panorama
- KOP 6 – State Route (SR) 97

The KOPs represent a sample of casual observers, including local, sensitive, and transitory observers. The observers differ in their distance from the project area and dominance and duration of view.

Photographs taken from each KOP that illustrate the current landscape view are included in Appendix I. To support the visual resource impact analysis and disclose potential visibility of the Proposed Actions, visualizations of the theoretical views of the projects from the KOPs were developed (see Appendix I). This provides an expected view of the completed stockpile. The visualizations are intended to provide a theoretical view of the final stockpile construction relative to the existing landform in 40 to 50 years. The monitoring well pads, associated access roads, and APS roads were not included in the visualizations, as they were focused on the stockpile extension. However, these project components were accounted for in the BLM Contrast Rating process, as described below.

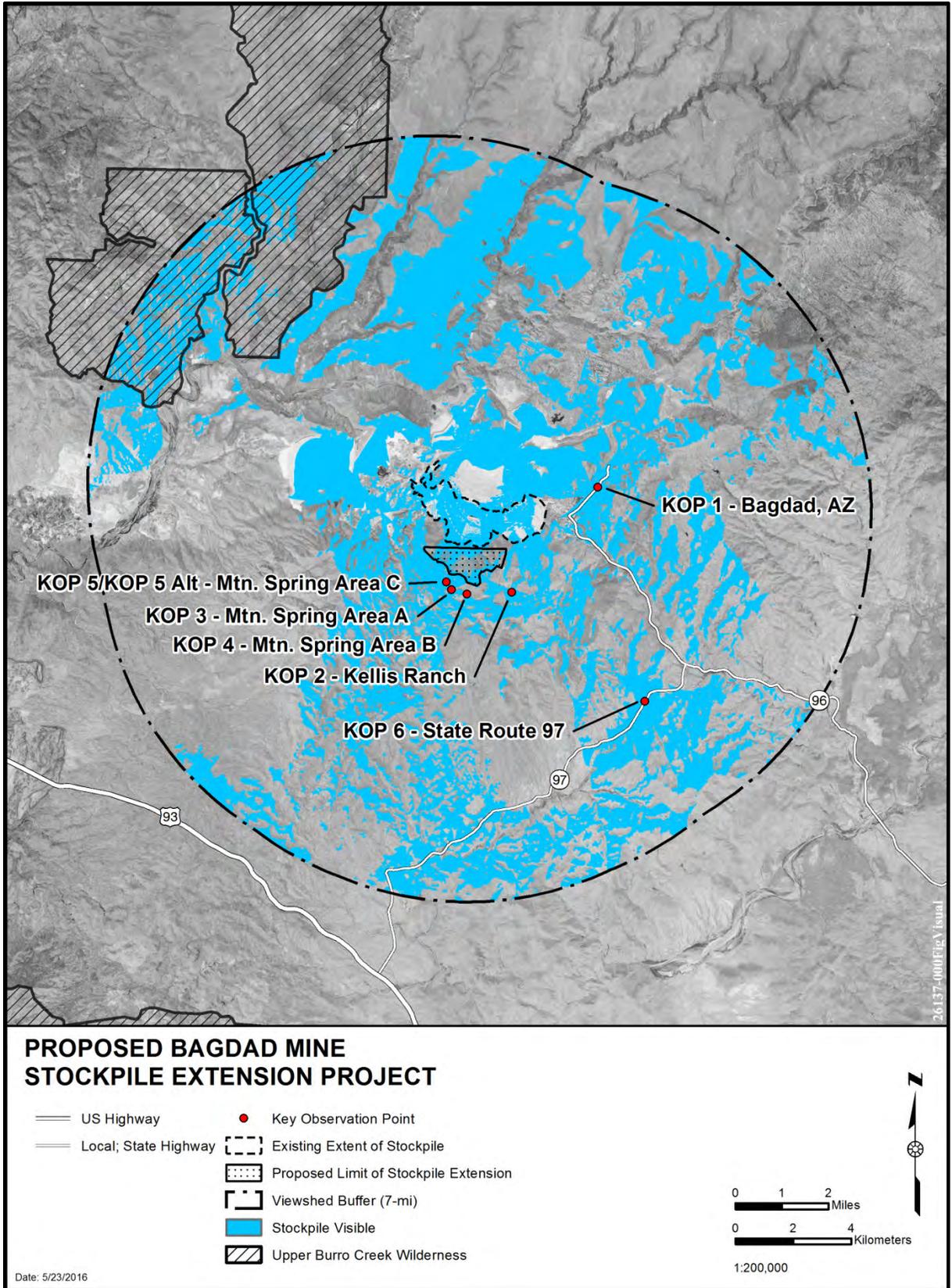


Figure 3.11-2. Waste rock stockpile viewedshed analysis.

The BLM Contrast Rating process was used to determine the visual contrast that may result from construction and reclamation of the stockpile extension and construction of the APS access roads. The contrast rating was based upon the visualizations of the proposed projects as described above and the expected visual contrast between the proposed project elements and the existing landscape character. At each KOP existing landforms, vegetation, and structures are described, along with a description of the proposed project. The level of perceived contrast between the proposed project and the existing landscape is then classified using the following definitions:

- **None:** The contrast is not visible or perceived.
- **Weak:** The element contrast can be seen but does not attract attention.
- **Moderate:** The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- **Strong:** The element contrast demands attention, would not be overlooked, and is dominant in the landscape.

The Contrast Rating Forms for each KOP are provided in Appendix I.

KOP 1 – BAGDAD, ARIZONA

KOP 1 is located in the town of Bagdad, Arizona, approximately 1.25 miles east of the existing Bagdad Mine waste rock stockpile at the intersection of Lindhal Road and Papago Drive. This KOP represents potential views looking west of the completed stockpile extension from the residents and visitors of Bagdad, Arizona. The general landscape view is panoramic and enclosed within a developed residential area. The foreground views include housing development structures (homes, fences, power lines, roads) with solid vertical and horizontal lines and white, gray, brown, and tan colors. Vegetation in the foreground includes residential landscaping trees and shrubs with dark green colors. Background views are made up of rolling hills and the existing waste rock stockpile. The rolling hills are green to gray with horizontal and undulating lines. The waste rock stockpile is tan with horizontal lines on the top of the stockpile; terracing on the stockpile faces and contrasts with the surrounding hills.

Proposed Bagdad Mine Stockpile Extension

The view of the completed stockpile extension from KOP 1 would contain bold, steep, hills with a pyramidal shape and flat horizontal top. Lines include diagonal lines from sloping faces and horizontal lines from terracing stacks on slope faces. Long-term reclamation plans call for covering the flat top surfaces and benches of the facility with a soil medium and revegetating the surface (Cyprus 1997). This is expected to result in sparse vegetation on the final stockpile area. Generally, the existing stockpile as viewed from KOP 1 would become larger and more prominent in the background view, obstruct views of the rolling hills in the background, and dominate foreground views when the stockpile construction is complete.

The anticipated degree of contrast between the existing landscape and the proposed stockpile extension is strong in the landscape elements of form and color, and moderate in line and texture.

The proposed monitoring wells and associated access roads would not be visible from KOP 1.

Proposed 115-kV Power Line Access Roads

The APS access roads would not be visible from KOP 1.

KOP 2 – KELLIS RANCH

KOP 2 is located at the Kellis Ranch residential property, approximately 0.75 mile from the proposed stockpile extension, and represents a potential view looking northeast toward the stockpile extension. Kellis Ranch is the nearest occupied residence, apart from the town of Bagdad, Arizona, to the proposed stockpile extension. The landscape is enclosed by rugged, steep, rounded top hills with rocky tan soils. Lines in the landscape are undulating horizontal lines with straight and curvilinear dirt roads in the foreground and middle ground views. Vegetation includes varied heights and shapes with spiky and rounded low shrubs and taller trees and shrubs in the background; vegetation colors are dark to light greens. Structures views are of residential homes, barns, and workshops, with livestock fencing and infrastructure.

Proposed Bagdad Mine Stockpile Extension

The view of the completed stockpile extension from KOP 2 would contain bold, steep hills with horizontal and diagonal lines in the background view. The color would vary from medium gray tones to medium brown and rust and would contain horizontal lines formed from the stockpile terrace construction. Long-term reclamation plans (Cyprus 1997) call for covering the flat top surfaces and benches of the facility with a soil medium and revegetating the surface. This is expected to result in sparse vegetation on the final stockpile area. The majority, including the top, of the completed stockpile would be obstructed by the existing landform. However, the stockpile would be visible in two saddles of the hillsides. The anticipated degree of contrast between the existing landscape and the proposed stockpile extension is strong in the landscape elements of form, line, and color, and moderate in texture.

The proposed monitoring wells and associated access roads would not be visible from KOP 2.

Proposed 115-kV Power Line Access Roads

The proposed APS access roads would not be visible from KOP 2.

KOP 3 – MOUNTAIN SPRING AREA A, BRUCE MINE ROAD

KOP 3 is located at the Mountain Spring Bruce Mine Road turnout area, approximately 0.5 mile from the proposed stockpile extension, and represents a potential view looking north toward the stockpile extension. Bruce Mine Road is a maintained dirt road used by recreationists, ranchers, and Bagdad Mine operators. Mountain Spring, adjacent to this KOP, is an important site to the Hualapai Tribe and is visited by tribal members. The landscape is enclosed by rugged, steep, rounded top hills with rocky tan soils. Foreground landscape views include the Bruce Mine Road with straight and curvilinear lines and a tan road surface. Vegetation is varied in height with clumped and rounded forms and is dark to light green in color. Power poles and lines are visible in the background view and present strong vertical lines that are brown in color. Appendix I includes a general visualization and panorama visualization of the proposed stockpile from this area.

Proposed Bagdad Mine Stockpile Extension

The view of the completed stockpile extension from KOP 3 would contain bold, steep hills with horizontal and diagonal lines in the background view. The color would vary from medium gray tones to medium brown and rust and would contain horizontal lines formed from the stockpile terrace construction. Long-term reclamation plans (Cyprus 1997) call for covering the flat top surfaces and benches of the facility with a soil medium and revegetating the surface. This is expected to result in sparse vegetation on the final stockpile area. The stockpile extension would extend above the existing landform and dominate the view. The anticipated degree of contrast between the existing landscape and

the proposed stockpile extension is strong in the landscape elements of form, line, and color, and moderate in texture.

The western monitoring well pad and access road may be visible from KOP 3 (see Figure 3.11-2). Vegetation may obstruct the view. If visible, the pad would appear as straight lines, brown to tan in color, on the top of the background hill slope. If visible, the monitoring well pad and access road would result in a weak contrast between the existing landscape and the project elements. The anticipated degree of contrast between the existing landscape and the proposed monitoring well pads and access road is moderate in the landscape elements of form, line, and texture and strong in color.

Proposed 115-kV Power Line Access Roads

Portions of Segments 1 and 2 of the proposed APS access roads would be visible from KOP 3 (see Figure 3.11-2). The view of the road segment would present a straight, diagonal line, brown to tan in color, across the background hill slope. The anticipated degree of contrast between the existing landscape and the proposed access road is moderate in the landscape elements of line and color and weak in form and texture.

KOP 4 – MOUNTAIN SPRING AREA B

KOP 4 is located along Bruce Mine Road in the Mountain Spring area, approximately 0.7 mile from the proposed stockpile extension, and represents a potential view looking north toward the proposed stockpile extension. Bruce Mine Road is a maintained dirt road used by recreationists, ranchers, and Bagdad Mine operators. Background landscape at this location is relatively enclosed by rugged, steep, rounded top hills with rocky tan soils and is somewhat open as the eye is drawn to the skyline. Foreground landscape views include the strong vertical lines and soft horizontal lines with rust-colored browns as a result of the 115-kV power lines that run along this KOP. In addition, the foreground view at this KOP features large boulder piles interspersed with a wide range of vegetation that is varied in height with clumped and rounded forms and is dark to light green in color.

Proposed Bagdad Mine Stockpile Extension

The proposed Bagdad stockpile extension, along with the proposed monitoring wells and associated access roads, would not be visible from KOP 4 (see attached visualization in Appendix I).

Proposed 115-kV Power Line Access Roads

The proposed APS access roads would not be visible from KOP 4.

KOP 5 – MOUNTAIN SPRING AREA C

KOP 5 is located along Bruce Mine Road at in the Mountain Spring area, approximately 0.2 mile from the proposed stockpile extension, and represents a potential view looking north toward the proposed stockpile extension. Bruce Mine Road is a maintained dirt road used by recreationists, ranchers, and Bagdad Mine operators. The landscape is relatively open and includes low, rolling hills with minimal vertical uplift. Foreground landscape views include faint horizontal lines with strong vertical lines and includes vegetation that is varied in height with clumped and rounded forms and is dark to light green in color.

Proposed Bagdad Mine Stockpile Extension

The view of the completed stockpile extension from KOP 5 would contain bold, steep hills with strong horizontal and diagonal lines in the background view. The color would vary from medium gray tones to medium brown and rust and would contain horizontal lines formed from the stockpile terrace construction. Long-term reclamation plans (Cyprus 1997) call for covering the flat top surfaces and benches of the facility with a soil medium and revegetating the surface. This is expected to result in sparse vegetation on the final stockpile area. The stockpile extension would extend above the existing landform and dominate the view. The anticipated degree of contrast between the existing landscape and the proposed stockpile extension is strong in the landscape elements of form, line, and color, and moderate in texture.

The proposed monitoring wells and associated access roads would not be visible from KOP 5.

Proposed 115-kV Power Line Access Roads

Portions of the proposed APS access roads are visible from KOP 5 (see Figure 3.11-2). The view of the road segment would present a straight, diagonal line, brown to tan in color, across the background hill slope. The anticipated degree of contrast between the existing landscape and the proposed access road is moderate in the landscape elements of line and color and weak in form and texture.

KOP 5 ALTERNATE – MOUNTAIN SPRING AREA C, PANORAMA

KOP 5 Alternate is located along Bruce Mine Road in the Mountain Spring area, approximately 0.2 mile from the proposed stockpile extension, and represents a panoramic view looking north toward the proposed stockpile extension. Bruce Mine Road is a maintained dirt road used by recreationists, ranchers, and Bagdad Mine operators. The landscape is relatively open and includes low, rolling hills with minimal vertical uplift. Foreground landscape views include Bruce Mine Road with straight and curvilinear lines with a tan road surface and faint horizontal lines with strong vertical lines that include vegetation that is varied in heights with clumped and rounded forms and is dark to light green in color.

Proposed Bagdad Mine Stockpile Extension

The view of the completed stockpile extension from KOP 5 Alternate would contain bold, steep hills with strong horizontal and diagonal lines in the background view. The color would vary from medium gray tones to medium brown and rust and would contain horizontal lines formed from the stockpile terrace construction. Long-term reclamation plans (Cyprus 1997) call for covering the flat top surfaces and benches of the facility with a soil medium and revegetating the surface. This is expected to result in sparse vegetation on the final stockpile area. The stockpile extension would extend above the existing landform and dominate the view. The anticipated degree of contrast between the existing landscape and the proposed stockpile extension is strong in the landscape elements of form, line, and color, and moderate in texture.

The proposed monitoring wells and associated access roads would not be visible from KOP 5 Alternate.

Proposed 115-kV Power Line Access Roads

Portions of the proposed APS access roads are visible from the KOP 5 Alternate. The view of the road segment would present a straight, diagonal line, brown to tan in color, across the background hill slope. The anticipated degree of contrast between the existing landscape and the proposed access road is moderate in the landscape elements of line and color and weak in form and texture.

KOP 6 – STATE ROUTE 97

KOP 6 is located on SR 97, approximately 5 miles from the stockpile extension and represents potential views looking northwest toward the stockpile extension. Viewers include persons traveling in vehicles at highway speeds. The existing landscape view is panoramic and open, with flat areas and rounded small hills in the foreground and rolling rounded hills in the background. The landform contains curvilinear and undulating lines with tan to medium brown rocky soils.

Proposed Bagdad Mine Stockpile Extension

The proposed stockpile extension would be located in the distant background view, would include steep hills and straight horizontal lines, and would appear gray to tan in color. Because the stockpile is in the background and persons traveling at highway speeds would have limited views, the stockpile contrast is anticipated to be moderate in the elements of form, line, color, and texture.

The proposed monitoring wells and associated access roads would not be visible from KOP 6.

Proposed 115-kV Power Line Access Roads

The proposed APS access roads would not be visible from KOP 6.

UPPER BURRO CREEK WILDERNESS

The Upper Burro Creek Wilderness southeastern boundary lies approximately 5 miles from the stockpile extension. Wilderness locations, within the 7-mile viewshed analysis area, from which the stockpile expansion could be viewed are presented in Figure 3.11-2. Persons visiting these portions of the wilderness could potentially view the stockpile extension project. However, with a viewing distance of 5 miles and greater, the stockpile extension would be in the far background views, with contrast anticipated to be weak in form, line, color, and texture. Nighttime views of the stockpile from the wilderness may include far background views haul truck headlights and taillights as they traverse the stockpile. However, at a distance of 5 miles, this lighting will be far in the background and should not disturb the viewshed of the wilderness.

Visual Resource Management Conformance

PROPOSED BAGDAD MINE STOCKPILE EXTENSION

The degree of contrast (i.e., anticipated impact) from the stockpile extension is strong to moderate, from most KOPs. While this strong contrast meets the objectives of VRM Class IV areas and is in conformance with the Kingman RMP, it is the goal of the BLM VRM program to lessen the contrast by applying appropriate mitigations to minimize contrast in form, line, color, and texture.

The degree of contrast from the monitoring wells and associated access roads is moderate from KOP 3, and none from the remaining KOPs. This moderate contrast meets the objectives of VRM Class IV areas and is in conformance with both the Kingman RMP and BLM VRM standards.

PROPOSED 115-KV POWER LINE ACCESS ROADS

The degree of contrast from the APS access roads is weak from KOP 3, KOP 5, and KOP 5 Alternate, and none from the remaining KOPs. This weak contrast meets the objectives of VRM Class IV areas and is in conformance with both the Kingman RMP and BLM VRM standards.

Mitigation Measures

As part of the applicant-committed environmental protection measures described in Chapter 2, FMBI would conduct long-term reclamation activities in the waste rock stockpile area. These activities, described in Chapter 2, include the following:

- strategic regrading and contouring of the facility to control and divert surface water runoff from the stockpile in order to minimize erosion and infiltration;
- covering the flat top surfaces and benches of the facility to limit precipitation infiltration and enhance revegetation;
- revegetating the covered surface to control erosion and minimize infiltration;
- construction of surface water runoff control and diversions channels with provision of appropriate erosion protection within the channels; and
- maintenance and construction of underdrains for stormwater management.

In addition to the environmental protection measures described in Chapter 2, BLM forms 8400-4 (Visual Contrast Rating Worksheet) were completed for each of the KOPs (see Appendix I). Mitigation measures were recommended as a result of this exercise, but were not carried forward into this analysis due to the low visual sensitivity of this area which was recorded during the Visual Resource Inventory prior to the Kingman Field Office RMP (1995).

Successful revegetation of the flat top surfaces would further reduce visual impacts by bringing in form, line, color, and texture elements from the surrounding landscape.

The BLM also recommends that wherever possible, the waste rock stockpile be designed to reduce the sharp angles and linear features and to reflect the form and line of the surrounding landscape.

Cumulative Impacts

The geographic boundary for visual resources cumulative effects is the same as direct and indirect effects. Existing visual resource environmental conditions in the vicinity of the proposed stockpile extension area reflect changes brought about by long-term mining activity, occupancy, and use. Ongoing or planned activities that may contribute to cumulative visual impacts include nearby past mining activities, activities related to the APS transmission line ROW, roads, and recreational activities. Mining related waste rock stockpiles currently impact views in the analysis area and planned/permitted stockpiles will continue to steadily increase impacts to visual resources over the next 50 years. Permitting the stockpile extension, monitoring wells, and associated access roads would create additional impacts to the visual resources in the area by creating a larger stockpile area. However, because the landscape already contains or is planned to contain waste rock stockpiles, this additional visual impact is expected to be minor in terms of a localized sensitivity to the landscape.

There would be impacts to visual resources as a result of the proposed APS access roads; however, these impacts would result in a negligible contribution to the overall cumulative modifications to visual resources in the analysis area.

3.12 NOISE

3.12.1 Resource Issues and Indicators for Analysis

The sole resource issue identified during scoping and related to noise (see Table 1.7-4) carried forward for analysis in this section is:

- How would noise from the Proposed Actions affect adjacent property owners and residents?

This issue is addressed below by examining the expected noise emissions from construction and operation of the Proposed Actions. Specifically, the indicators used to analyze these issues are as follows:

- The noise level resulting from the Proposed Actions, compared with background (ambient) noise levels.
- Conformance with established federal noise emission control requirements.

3.12.2 Affected Environment

The affected environment is analyzed within a designated analysis area, extending 1 mile beyond the site of the Proposed Actions. A 1-mile boundary was chosen because sound attenuates greatly over distance; for example, a noise 100 A-weighted decibels (dBA) 3 feet away from a source would attenuate to less than 40 dBA at a distance of 1 mile. The analysis area is entirely within Yavapai County in Arizona.

Metrics Descriptions

All metrics discussed in this section are in dBA. A-weighting is used to account for the relative loudness as perceived by the human ear as perceived at different frequencies, in contrast to unweighted decibels, which measure sound pressure level. Other sound measures used in this section are:

- L_{eq} is the energy equivalent sound level. It is the preferred way to describe sound levels that vary over time, it is a single decibel value that represents the level of a constant sound over a specific time period that has the same sound energy as the actual (unsteady) sound over the same period.
- $L_{eq(24)}$ is the 24-hour energy equivalent sound level. It is calculated the same as L_{eq} , with the special condition that it is specifically the average over a 24-hour period.
- L_{dn} is the day-night sound level. It is calculated the same as L_{eq} , with the exception that 10 dBA is added to the overnight sound level, to account for increased sensitivity to noise during these times.

Federal Guidelines

There are no federal regulations that limit overall environmental noise levels, but several federal agencies have established guidelines that are either advisory or apply in narrow circumstances. The EPA and U.S. Department of Housing and Urban Development (HUD) guidelines presented below are not limitations to which the Proposed Actions must adhere, but they are useful in characterizing what noise level is acceptable for an area. These guidelines indicate that residential noise exposures of 55 to 65 dBA L_{dn} are acceptable, and are explained in more detail below.

U.S. ENVIRONMENTAL PROTECTION AGENCY, NOISE CONTROL ACT OF 1972

The Federal Noise Control Act of 1972 and subsequent amendments (42 USC 4901 *et seq.*) established a requirement that all federal agencies must administer their programs in a manner that promotes an environment free from noise that jeopardizes public health or welfare. The EPA was given the responsibility for providing information to the public regarding identifiable effects of noise on public health or welfare, publishing information on the levels of environmental noise that will protect the public health and welfare with an adequate margin of safety, coordinating federal research and activities related to noise control, and establishing federal noise emission standards for selected products distributed in interstate commerce (construction equipment; transportation equipment; motors and engines; and electrical or electronic equipment).

In order to establish federal noise emission control requirements and to ensure assistance and guidance to states and localities, the EPA has published guidelines that address the issue of community noise and contains goals for noise levels affecting residential land use of L_{dn} of less than 55 dBA for exterior levels and L_{DN} of less than 45 dBA for interior levels (EPA 1974). Table 3.12-1 presents the noise levels identified as requisite to protect public health and welfare with an adequate margin of safety.

Table 3.12-1. Noise Levels Identified to Protect Public Health and Welfare with an Adequate Margin of Safety

Effect	Level	Area
Hearing loss	$L_{eq(24)} \leq 70$ dBA	All areas.
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dBA	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq(24)} \leq 55$ dBA	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{dn} \leq 45$ dBA	Indoor residential areas.
	$L_{eq(24)} \leq 45$ dBA	Other indoor areas with human activities such as schools, etc.

Source: EPA (1974).

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Chapter 2 of the HUD Noise Guidebook lists a goal that outdoor residential areas follow the EPA guideline of 55 dBA L_{dn} (24 CFR 51.101(a)(8)). However, for the purposes of meeting this regulation, sites with an L_{dn} of 65 dBA and below are acceptable and allowed.

State and Local Regulations

There are no state or county level noise limitations in Arizona or Yavapai County. Because the property is not located within a municipality, there are also no municipal ordinances regulating noise for the FMBI and APS Proposed Action areas.

Background Noise

No site-specific data exist for the background noise at the Proposed Action area. However, given that the Proposed Action area is just bordering the Bagdad Mine, it can be assumed that existing mining activities such as blasting, hauling, and stockpiling; and mining equipment, such as crushers, trucks, and bulldozers

contribute to the ambient noise level in the area. In the absence of quantitative data, it is assumed that the ambient noise level would be at least 60 dB (the level of an average conversation, or a living room with music or television playing quietly).

3.12.3 Environmental Consequences

The noise level resulting from the Proposed Actions was estimated using the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM). The RCNM is the FHWA's national model for the prediction of construction noise. This software is based on actual sound-level measurements from various equipment types taken during the Central Artery/Tunnel project conducted in Boston, Massachusetts, during the early 1990s. Although the proposed stockpile extension is not a road construction project, the RCNM includes the same equipment that will be used in the construction of the stockpile extension. The maximum noise levels presented at the nearest noise sensitive receptor (in this case, the residence at Kellis Ranch) is based on providing the RCNM with a roster of likely construction equipment operating and shortest distance of construction equipment to the receptor. The average impact would be less.

Proposed Bagdad Mine Stockpile Extension

The FMBI Proposed Action would impact background noise levels in the area due to noise levels generated from normal operations of the proposed stockpile extension and the construction of the monitoring wells and associated access roads. Additionally, the drilling of two monitoring wells and the construction of access roads to the wells would also impact ambient noise level in the area.

Normal operation of heavy equipment for the stockpile would largely include use of front loaders and large haul trucks. Assuming this equipment would be approximately 3,500 feet from the residence (the shortest distance from the edge of the proposed stockpile extension footprint to Kellis Ranch), the RCNM predicts that the 1-hour L_{eq} at the residence from this equipment operating would be 46.8 dBA. However, equipment would typically be even farther than the point used in this analysis. Mining operations would not be expanding, but stockpiling activities would extend into the proposed footprint and closer to the residence over time. The proposed stockpile extension would result in minor, long-term impacts to ambient noise levels in the analysis area over the next 50 years. Noise levels near the residence would rise during stockpiling equipment operation in the vicinity, but with a typical dBA level of 46.89, would remain under 55 dBA (outdoor activity interference and annoyance; see Table 3.12-1). Construction of the monitoring wells and associated access roads would also include use of equipment, including a bulldozer, grader, backhoe, and drill rig. Assuming this equipment were operating approximately 1,480 feet from the residence (at the closest proposed well location), the RCNM predicts that the 1-hour L_{eq} at the residence from this equipment operating would be 54.8 dBA. Since construction would not take place at night, 24-hour measures of impact ($L_{eq(24)}$ and L_{dn}) would be far below 54.8 dBA. This would result in a moderate impact, just below the EPA-identified noise level of 55 dBA; however, this increase in ambient noise would be short term, lasting only the duration of construction of the monitoring well and associated access road.

The impacts of the increased noise levels resulting from the proposed stockpile extension, monitoring wells, and associated accessed roads are below the estimated background noise level of 60 dBA for the area, and below the EPA and HUD guidelines. Given that the impact would be below the estimated background, there no impacts are anticipated on residences in the area.

Proposed 115-kV Power Line Access Roads

Noise impacts from the power line access roads are construction related. To estimate these impacts, a bulldozer, grader, and backhoe were assumed to be operating 5,000 feet from the residence (this is the shortest distance from the closest access road to the residence). The RCNM predicts that the 1 hour L_{eq} at the residence from this equipment operating would be 43.2 dBA. However, equipment would typically be even farther from the point used in this analysis. This would result in a negligible, short-term impact that would last the duration of access road construction.

The maximum noise impact from the construction of the APS access roads would therefore be 43.2 dBA at the residence. Since construction would not take place at night, 24-hour measures of impact ($L_{eq(24)}$ and L_{dn}) would be far below 43.2 dB. Additionally, this is below the estimated background noise level of 60 dBA for the area, and below the EPA and HUD guidelines. Given that the impact would be below the estimated background, no impacts are anticipated on residences in the area.

Mitigation Measures

No additional mitigation measures for attenuating noise impacts in the Proposed Action areas have been identified.

Cumulative Impacts

The analysis area for cumulative impacts extends 1 mile from the FMBI Proposed Action because noise is a short-range phenomenon, and most noises diminish to below background levels within 1 mile. Additionally, noise levels do not grow in size or effect in that many sources significantly below background would not create a larger cumulative impact. Only noise near or above the background level could be classified as an impact.

Cumulative actions potentially in the analysis area include construction of APS power line; public forms of multiple-use across BLM lands; maintenance forms of multiple use; and mineral exploration, extraction, and/or development. Impacts from these actions cannot be evaluated without knowing the planned location and equipment being used. Like the Proposed Action, all cumulative actions identified (except for the Bagdad Mine) consist of mostly short-term noise impacts (i.e., construction noise, or infrequent vehicle travel). The likelihood of all these short-term impacts occurring at the same time is expected to be small.

The only long-term noise impact in the analysis area is the continued operation of the Bagdad Mine. However, even without approval of the proposed stockpile extension, the Bagdad Mine would continue to operate using the same noise-generating equipment and conditions as it has for many years. The FMBI and APS Proposed Actions are not expected to cumulatively contribute to noise impacts in the analysis area throughout the life of the mining project.

3.13 LAND USE / GRAZING

The following section describes the baseline conditions of the affected environment for land use, which includes the discussion of land ownership, management of public lands, ROWs, and grazing.

3.13.1 Resource Issues and Indicators for Analysis

Resource issues identified during scoping and related to cultural resources (see Table 1.7-4) carried forward for analysis include the following:

- How would the Proposed Actions impact future land use in the project area?
- How does existing land use, including patented and unpatented mining claims in the project area, affect the NEPA process?
- How would the Proposed Actions affect grazing leases in the project area and would retirement of grazing leases in the region be available for project mitigation?
- What will the effects be on grazing permits in the area?
- How will the stockpile extension affect waters used by livestock?

The indicators used to analyze these issues for land use and grazing resources are as follows:

- Acres of BLM-managed land (Kingman Field Office) that would be unavailable for other uses.
- Acres of BLM-managed land (Kingman Field Office) that would be unavailable for grazing use.
- Range improvements (such as fences, wells, windmills, etc.) that would be lost.

3.13.2 Affected Environment

Potential project-related direct impacts to land use are anticipated to be largely restricted to the project footprint. Therefore, the analysis area for assessing direct, indirect, and cumulative impacts to land use is defined as the proposed stockpile extension area, totaling approximately 441 acres of BLM-managed land and 79 acres of FMBI-owned lands, as well as approximately 1.4 acres of APS power line access roads and 1.0 acre of FMBI monitoring well pads and access roads, totaling approximately 522.4 acres.

Because of the potential loss of or access to available grazing lands as a result of project-related activities, the analysis area for assessing direct impacts to livestock grazing is defined as the 1,745 acres of the Kellis Lease allotment on BLM-administered lands. For indirect and cumulative impacts, the analysis area is considered the approximately 14,360-acre Kellis Lease allotment in its entirety, encompassing BLM, state trust, and private lands.

Land Use

The analysis area is located in rural Yavapai County. Under the Yavapai County Comprehensive Plan, the area surrounding Bagdad is zoned as rural residential in use, and categorized as a Municipal Growth Area, largely established with pockets of vacant land (Yavapai County 2012). While the lands within the project area allow for residential use, under Arizona Revised Statutes 11-812.A2, a mining property is exempt from county land use regulations. Land ownership within the project area consists of private lands owned by FMBI and public lands managed by the BLM Kingman Field Office. The Kingman RMP guides the management of the project area. The plan is designed to guide future management of public lands in the Kingman Field Office. The current management of the project area falls under the multiple-use and sustained-yield principles for which BLM-administered land is typically managed. The Kingman RMP provides opportunities for multiple land uses in the analysis area, and the proposed project conforms to the intent of the plan (BLM 1993).

Land in the analysis area is largely undeveloped and is characterized by vacant open desert and by areas used for grazing, mining, utilities and recreation (see Section 3.10, Recreation Resources/Public Access). One grazing allotment encompasses the project area. Existing ROWs in the project area include an APS 115-kV power line ROW.

In addition to these land uses and authorizations, FMBI holds the right to extract minerals and conduct mining-related activities in the analysis area through the ownership of patented claims, as well as the ownership of unpatented claims located on BLM-managed lands. At present, FMBI holds 10 unpatented lode mining claims and 262 unpatented mill site claims that intersect or are within the BLM-managed lands in the analysis area (FMBI 2014).

Grazing

The Kingman Field Office is responsible for managing livestock grazing on approximately 2.4 million acres of its public lands, which includes primarily the grazing of domestic cattle and some horses, with domestic sheep and goat activity historically (BLM 1993). The Kingman Field Office's management of these lands is governed under either Section 3 or Section 15 of the Taylor Grazing Act. Section 3 pertains to the issuance of grazing permits on federal lands within the original grazing district boundaries established by the Taylor Grazing Act of 1934. For allotments under Section 3 purview, the BLM sets the livestock numbers for all lands (federal, state, private). Lands that fall outside the original grazing district boundary are governed under Section 15, where leases are issued for grazing activities. Additionally, the BLM determines the livestock numbers for federal lands only under Section 15. For planning purposes, the BLM uses the concept of an animal unit (AU), defined by the size and class of a particular kind of animal, such as a 1,000-pound steer when analyzing cattle-forage use.

Most ranching operations on Kingman Field Office lands tend to be cattle and calf enterprises that range from seasonal to year-round. The BLM recognizes that its rangelands can only be sustained with appropriate management of grazing activities and permitted livestock numbers for an allotment is set at levels that provide rangeland health through proper use and sustained yield. These starting levels for each allotment have been determined by vegetation inventories and are periodically monitored to determine trends or range condition.

The project area is located within the Kellis Lease grazing allotment, a custodial allotment managed to protect existing resource values (BLM 1993). The Kellis Lease allotment is named for the Kellis family, who have been in the Bagdad area since the Great Depression and today are still the current lessees. The Kellis Lease allotment is under Section 15 purview and is outside the original Taylor Grazing Act district boundaries. This allotment is further classified according to the type of forage available, with the Kellis Lease classified as both a perennial (available consistently each year) and ephemeral (annual forage productive in response to precipitation and warm temperatures) allotment. The entire Kellis Lease allotment contains approximately 14,360 acres. Approximately 12,615 acres of this allotment are on private or state trust land, and approximately 1,745 acres are on BLM managed lands, with the portion of the Kellis allotment on BLM land including 8 AUs (i.e., 8 cattle) (BLM 2011).

In addition to forage resources, the project area also contains various infrastructure improvements related to current and past grazing activities. A permittee or lessee's interest in public land range improvements is documented by a Range Improvement Permit (RIP) or a Cooperative Range Improvement Agreement (CRIA). Prior to 1995, an RIP was used to construct any kind of range improvement, but has since been limited to authorizing only temporary (i.e., removable) improvements (BLM 2015b). At present, a CRIA may be used for any type of improvement, but must be used in the event new permanent water developments (e.g., spring boxes, wells, stock tanks, reservoirs, pipelines) are to be authorized. The United States holds title to any improvement authorized under a CRIA constructed after August

1995. The cancellation or reduction of a permit or lease requires compensation to the permittee/lessee for any interest in the improvement (43 CFR 4120.36(c)). Additionally, any improvement under an RIP may be salvaged or removed in lieu of compensation (BLM 2015b).

As stated above, the analysis area contains infrastructure improvements related to grazing activities, while others are associated with historic-era mining and prospecting. For the purposes of this EA, improvements that may be used for better management of livestock (e.g., roads, fences, windmills) are considered range improvements, regardless of historic use. These range improvements may or may not be authorized under an RIP or CRIA for use in the Kellis Lease allotment. In addition to various access roads and the allotment boundary fence, known range improvements within the analysis primarily consist of four stock tanks (S1–S4 in Figure 3.5-1). Two of these stock tanks are constructed boxes associated with springs (S2 and S3), while another is constructed of an earthen berm. These three stock tanks are non-functional as they are washed out or filled with sediment and no longer retain water. S4 consists of a metal stock tank that appears to be fed by the adjacent well. A fifth stock tank at Mountain Spring (S5) is located outside the project footprint. No known livestock waterlines would be crossed by the proposed actions (see Table 3.5-1).

3.13.3 Environmental Consequences

Land Use

PROPOSED BAGDAD MINE STOCKPILE EXTENSION

Under the Mining Law, FMBI is permitted to extend the stockpile because of existing mining claims and rights of entry, and the implementation of the FMBI Proposed Action would not alter existing BLM land ownership. The Proposed Action would require approval from the BLM to modify the existing Bagdad MPO in order to occupy BLM-managed lands with the proposed stockpile extension, and no new federal permits would be required to continue mining operations (including processing and production). Additionally, the proposed stockpile extension, and FMBI wells and access roads would not result in any land use, access, or ROW conflicts. Existing land uses would be precluded and replaced with the extension of the stockpile, and there would be no direct or indirect impacts to land uses outside the project area. The extension of the stockpile, monitoring wells, and associated access roads would result in the conversion of a total of approximately 521 acres from primarily undeveloped, open desert to mining disturbance. This would preclude existing land uses from approximately 442 acres of public lands.

PROPOSED 115-KV POWER LINE ACCESS ROADS

Existing BLM land ownership would not be impacted by the approximately 1.4 acres of public lands that would be disturbed by the construction of the two proposed APS access roads. Approval from the BLM would be required to amend the existing ROW for the proposed access roads. If granted, APS would establish a preliminary 80-foot ROW for each of the segments proposed for construction in consideration of terrain and known cultural resources in the analysis area. After construction is completed, APS would submit “as built” design plans to the BLM for determination of the final width of the ROW amendment. APS has indicated to BLM that the average width of each of the road segments is estimated at approximately 18 feet. BLM would require that the proposed APS access roads not result in any land use, access, or ROW conflicts.

Grazing

PROPOSED BAGDAD MINE STOCKPILE EXTENSION

All rangeland resources within the proposed stockpile extension area would be permanently lost to grazing activities, totaling approximately 521 acres under the Proposed Action. The primary direct impact to grazing resources would be removal of potential forage. Forage removal of approximately 441 acres would occur on the portions of the Kellis Lease allotment on BLM-managed lands, with an additional approximately 1.0 acre removed as a result of the proposed FMBI monitoring wells and access roads. A total of 2.4 AUs would coincide with this loss of potential forage. Collectively, these acres represent approximately 25.3% of the BLM-managed portions of the allotment, resulting in a one-fourth reduction of the 1,745 acres available for grazing. However, the overall direct impact to the allotment would be minor, with the Proposed Action removing approximately 3.1% of potential forage from the entire Kellis Lease allotment.

Structural range improvements would also be affected. Three stock tanks (S1–S3) would be completely covered by the stockpile extension; however, loss of such improvements would be negligible, as these stock tanks are not functional. The loss of any authorized improvements (either under an RIP or CRIA) lost under the Proposed Action, in which the operator of the Kellis Lease allotment has documented interest, would follow Section 402(g) of the FLPMA and the BLM's grazing regulations (43 CFR 4120.3–6(c)). Other minor, long-term impacts would result from the loss of approximately 2.1 miles of primitive roads that provide access these range improvements.

In addition, 2.4 AUs would be lost as a result of the Proposed Action. A 2-year waiver would be granted by the BLM for the loss of these AUs in the Kellis Lease allotment, after which the loss would be considered permanent. As described in the applicant-committed environmental protection measures presented in Chapter 2, FMBI would avoid disturbance to the stock tank located just within the proposed limit of stockpile extension southern boundary (see S4 in Figure 3.5-1). This range improvement is generally located on the ridgeline and would remain undisturbed by the waste rock in the stockpile extension, which would remain below the ridgeline. With the application of this measure, there would be no impact to the one functioning stock tank located within the project area. Therefore, direct impacts to range waters as a result of the proposed stockpile extension would be negligible and long term.

The BLM would require relocation of the existing boundary fence for the amended allotment. Displacement of livestock would be a long-term, direct impact; however, this would be minor because of the relatively small loss to the Kellis Lease allotment (2.4 AUs total). No other grazing leases (Section 15 lands) or permits (Section 3 lands) would be impacted by the proposed stockpile extension, or by the monitoring wells and associated access roads.

PROPOSED 115-KV POWER LINE ACCESS ROADS

Forage removal from the portions of the Kellis Lease allotment that coincide with the proposed APS access roads would be the primary impact to grazing resources. Under the Proposed Action, approximately 1.4 acres of potential forage on BLM-managed lands would be removed from the Kellis Lease allotment and unavailable for grazing use. This long-term impact would be negligible, as the Proposed Action area represents only a very small fraction of the total 1,745 acres of the allotment managed by the BLM, and an even more minute fraction of the 14,367-acre Kellis Lease allotment.

Construction activities could impact grazing livestock and access to range improvements in the vicinity of the project area. This would be minor and temporary, and last only the duration of construction. Under the Proposed Action, there would be no long-term impacts to livestock grazing outside the project area. After

construction, livestock that may be present in adjacent areas of the allotment would not be adversely impacted by the infrequent maintenance activities occurring along the access roads. Additionally, vehicle traffic associated with the Proposed Action could result in some minor, temporary impacts, considering the region is characterized by open range, and livestock may be found on access roads in the general area.

Mitigation Measures

LAND USE

No mitigation measures for land use are recommended.

GRAZING

No mitigation measures for grazing resources are recommended.

Cumulative Impacts

LAND USE

The geographic boundary for cumulative effects on land use resources is the same as direct and indirect effects. Existing environmental conditions in the vicinity of the Proposed Action area reflect changes brought about by long-term mining activity, occupancy, and use. Ongoing or planned activities that may contribute to cumulative impacts include nearby past mining activities, activities related to the transmission line corridors, and grazing activities.

The proposed projects would result in surface disturbance totaling 522.4 acres (521 acres for the FMBI Proposed Action and 1.4 acres for the APS Proposed Action). This new disturbance totaling approximately 522.4 acres would be a minor, long-term cumulative impact to land use because, while the Proposed Action would close these lands in the project area to all other non-mining uses for several decades, there would be no change in land uses in adjacent areas.

No additional, reasonably foreseeable future actions are known that would contribute cumulatively to impacts to land use in the project area.

GRAZING

The geographic boundary for cumulative effects on grazing resources is the same as indirect effects (the Kellis Lease allotment). Existing environmental conditions in the vicinity of the project area reflect alterations brought about by long-term mining activity and development and occupancy. Past actions resulting in surface disturbance and vegetation removal have resulted in a loss of forage available to livestock within the grazing allotment. Reclamation of some disturbed areas over time has reduced impacts to vegetation and livestock grazing conditions. Ongoing or planned activities that may contribute to cumulative impacts include nearby past mining activities, activities related to transmission lines, and grazing activities. Impacts to grazing conditions would depend on the placement and type of surface disturbance and the plant species present within these areas of ongoing or planned activities.

The proposed projects would result in extension of the existing stockpile onto 520 acres (441 acres of BLM lands and 79 acres of FMBI lands) with approximately 1.0 acre of surface disturbance for the FMBI monitoring well pads and access roads, and approximately 1.4 acres for the APS access roads. This would result in total new disturbance and loss of approximately 443.4 acres (3.1%) of the public lands in the Kellis Lease allotment. While the Proposed Action would result in the 25.7% loss of potential forage on BLM-managed lands within the allotment, this contribution to cumulative effects in the analysis area

would be localized so that no additional forage would be lost in the remaining portions of the Kellis Lease allotment. No additional reasonably foreseeable future projects are known that would contribute cumulatively to impacts to rangeland resources and grazing in the remainder of the Kellis Lease allotment.

3.14 EFFECTS OF THE NO ACTION ALTERNATIVES

3.14.1 Proposed Bagdad Mine Stockpile Extension

Under the No Action Alternative for the proposed stockpile extension, BLM would not approve disturbance on any of the 441 acres of BLM-managed land located in Sections 16 and 17, Township 14 North, Range 9 West, and none of the impacts associated with the Proposed Action as described in Chapter 2 and analyzed in Chapter 3 would occur. However, FMBI would continue mining activities on approximately 671 acres of BLM-managed lands in Sections 8 and 9, Township 14 North, Range 9 West under the approved 1996 MPO, as well as several subsequent modifications to the MPO (1996 MPO Amendment [approved 1997]; 2004 Minor Modification [approved 2005]; 2011 MPO Addendum [approved 2012]). Impacts analyzed in the 1995 *Cyprus Bagdad Copper Corporation Proposed Tailings and Waste Rock Storage Areas, Final Environmental Impact Statement* (BLM 1996a) and 1996 ROD (BLM 1996b) would continue to occur.

3.14.2 Proposed 115-kV Power Line Access Roads

Under the No Action Alternative for the APS power line access roads, BLM would not approve disturbance on any of the approximately 7.0 acres of BLM-managed land located in Section 17, Township 14 North, Range 9 West, and none of the impacts associated with the APS Proposed Action as described in Chapter 2 and analyzed in Chapter 3 would occur. APS would need to use alternative methods to access and maintain transmission facilities within its approved 115-kV power line ROW (BLM 2009a) that would not involve surface disturbance of these public lands.

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Chapter 4

CONSULTATION AND COORDINATION

4.1 PUBLIC OUTREACH/INVOLVEMENT

The BLM conducted public involvement activities throughout development of this EA. Public scoping, as described in Chapter 1, was conducted at the beginning of the EA process. A formal 45-day scoping period was conducted and the BLM continued to be available for public input throughout the EA development process. The Draft EA will be available for a 30-day public comment period.

4.2 TRIBAL CONSULTATION

The BLM conducted government-to-government tribal consultation for the FMBI stockpile extension and APS ROW amendment Proposed Actions with the Hopi Tribe, Hualapai Tribe, and Yavapai-Prescott Indian Community. Appendix J provides a listing of the tribal consultation (both formal and informal) conducted during the EA process.

4.3 COORDINATION AND/OR CONSULTATION (AGENCIES)

The BLM coordinated and/or consulted with a variety of agencies in preparation of this EA. These agencies included:

- Arizona State Historic Preservation Office
- U.S. Army Corps of Engineers
- Arizona Game and Fish Department
- Arizona State Land Department
- Yavapai County
- Mohave County

4.4 LIST OF PREPARERS

The BLM established an interdisciplinary team made up of BLM staff specialists (Table 4.4-1) that developed the EA environmental analysis. The BLM worked with cooperating agencies (Table 4.4-2) and a third-party contractor (Table 4.4-3) to develop the content and analysis in the EA.

Table 4.4-1. BLM Interdisciplinary Team

Name	Project Role
Walter "Buzz" Todd, III	Project Manager, Geologist
Amanda Dodson	Field Manager
Ruben Sanchez	Field Manager
Don McClure	Assistant Field Manager
Rebecca Peck	Biologist
Matt Driscoll	Recreation Planner, Visuals
Mark "Andy" Whitefield	Lands and Realty
Shane Rumsey	Archaeologist
Mike Blanton	Rangeland Resources
Mark D'Aversa	Water Resources
Victoria Anne	NEPA Compliance

Table 4.4-2. Cooperating Agencies

Name	Agency
Joe Dixon	Arizona State Land Department
Trevor Buhr	Arizona Game and Fish Department
Dee Kephart	Arizona Game and Fish Department
Hal Barton	Mohave County

Table 4.4-3. Third-Party Contractor: SWCA Environmental Consultants

Name	Project Role, Responsibility
Charles Coyle	Project Manager
Jill Grams	Assistant Project Manager, Visual Resources
Chris Horyza	NEPA Adequacy Review/Cooperating Agency Liaison
Adrienne Tremblay	Cultural Resources
Eleanor Gladding	Biological Resources
Jeff Johnson	Biological Resources
DeAnne Rietz	Water Resources
Ryan Rausch	Recreation Resources
Annie Lutes	Land Use and Grazing
Brad Sohm	Air and Noise Resources
Steve O'Brien	Geology
Glenn Dunno	GIS Specialist
Donna Morey	Project Administrator
Heidi Orcutt-Gachiri	Technical Editor
Shari Bell	Publications Specialist

Chapter 5

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