

Prepared for
Midas Gold Idaho, Inc., Valley County, Idaho



Final Stibnite Gold Mitigation Plan

April 2019



Stibnite Gold Mitigation Plan

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This is a draft and is not intended to be a final representation
of the work done or recommendations made by Brown and Caldwell.
It should not be relied upon; consult the final report.



950 West Bannock Street, Suite 350
Boise, ID 83702

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List of Acronyms and Abbreviations

AA	assessment area
AJD	approved jurisdictional determination
BC	Brown and Caldwell
BNF	Boise National Forest
CFR	Code of Federal Regulations
Chinook salmon	Snake River spring/summer Chinook salmon
CMP	Conceptual Stream and Wetland Mitigation Plan
CWA	Clean Water Act
DA	Department of the Army
DCH	designated critical habitat
EFH	essential fish habitat
EFSFSR	East Fork South Fork Salmon River
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
EMMP	Environmental Monitoring and Management Plan
ESA	Endangered Species Act
FI	functional index
FMP	Fisheries and Aquatic Resources Mitigation Plan
FOMP	Fishway Operations and Management Plan
FU	functional unit
GIS	Geographic Information System
HFA	Wildlife Habitat Functional Assessment
HFU	Habitat Functional Unit
IDEQ	Idaho Department of Environmental Quality
IDL	Idaho Department of Lands
IPDES	Idaho Pollutant Discharge Elimination System
JD	jurisdictional determination
LRMP	Land and Resource Management Plan
Midas Gold	Midas Gold Idaho, Inc.
MWAM	Montana Wetland Assessment Method
NEPA	National Environmental Policy Act
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
PJD	preliminary jurisdictional determination
PNF	Payette National Forest
PRO	Plan of Restoration and Operations
RCP	Reclamation and Closure Plan
Rio ASE	Rio Applied Science and Engineering
SFA	stream functional assessment

SGMP	Stibnite Gold Mitigation Plan
SGP	Stibnite Gold Project
steelhead	Snake River Basin steelhead
the Services	USFWS and NOAA Fisheries
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WCI	Watershed Condition Indicator
WHMP	Wildlife Habitat Mitigation Plan
WOTUS	waters of the United States

Executive Summary

Midas Gold Idaho, Inc. (Midas Gold) submitted its Plan of Restoration and Operations (Midas Gold 2016) to meet the requirement for a plan of operations for approval by the U.S. Forest Service (USFS) for Stibnite Gold Project (SGP or Project) operations on the surface of National Forest System lands under regulations at 36 Code of Federal Regulations (CFR) 228 Subpart A, Locatable Minerals, and to meet the approval requirements for a plan of operations by the Idaho Department of Lands (IDL) under state regulations and Idaho code. Midas Gold developed a comprehensive mitigation plan for the SGP that addresses historical mining impacts at the site and mitigation for proposed mining impacts and will produce post-mining conditions that will achieve a net benefit for ecological resources at the Project site. Midas Gold's Stibnite Gold Mitigation Plan (SGMP) goes beyond required mitigation and reclamation to create a net benefit on a landscape scale at the Project site after completion of mining and reclamation.

Midas Gold began the mitigation plan development by first following a rigorous impact avoidance and minimization process consistent with federal mitigation sequence policy—avoid, minimize, and compensate—and only then, after identifying the remaining unavoidable impacts of the Project, developed a Conceptual Stream and Wetland Mitigation Plan (CMP) to more than offset those impacts.

The structure of the CMP, and generally the SGMP, addresses the 12 required elements of compensatory mitigation plans (33 CFR 332.4(c)/40 CFR 230.94(c)): objectives, maintenance plan, site selection, performance standards, site protection, monitoring requirements, baseline information, long-term management plan, determination of credits, adaptive management plan, mitigation work plan, and financial assurances.

The SGMP includes the CMP, a Fisheries and Aquatic Resources Mitigation Plan (FMP) and associated Fishway Operations and Maintenance Plan, and Wildlife Habitat Mitigation Plan (WHMP). Together, they meet many of the mitigation requirements of the lead federal agency for the SGP environmental impact statement (EIS), the USFS, the compensatory mitigation process and requirements of the U.S. Army Corps of Engineers (USACE), and the reclamation requirements of the IDL. In addition, the FMP represents a proactive effort to incorporate many measures to avoid and minimize potential impacts to species listed under the Endangered Species Act, and the WHMP represents a proactive voluntary effort to repair historical mining impacts and improve wildlife habitats beyond the requirements under IDL regulations.

This SGMP document outlines Midas Gold's mitigation plan goals and objectives and the process Midas Gold followed to develop the SGMP, including addressing regulatory requirements and consistency with the Payette National Forest and Boise National Forest Land and Resources Management Plans. The SGMP and its component documents summarize the methods that Midas Gold has used to account for the ecological functional value of habitat losses due to mining and habitat gains due to restoration. The use of functional assessments, mandated by the Final Rule, Compensatory Mitigation for Losses of Aquatic Resources (2008 Mitigation Rule; 33 CFR Parts 325 and 332 and 40 CFR Part 230), is central to the development of Midas Gold's mitigation plans and their accounting of mitigation credits, in mitigation ledgers. The mitigation ledgers allow Midas Gold and the regulatory agencies to transparently quantify and track impacts and compensatory mitigation over time and cumulatively.

Midas Gold anticipates that the SGMP and its component plans will be revised due to changes to the Proposed Action as the USFS proceeds through the EIS process and develops the draft and final EIS.

Midas Gold is coordinating closely with the USACE Regulatory Division—Walla Walla District through the Boise Field Office on compliance with the Clean Water Act Section 404/Department of the Army permit process, stream and wetland delineations and jurisdictional determinations, development of the stream functional assessment for USACE-approved stream functional analysis, wetland and stream credits and debits determinations, and compliance with USACE’s 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230). Midas Gold anticipates identifying optional or additional fisheries management measures through the ESA informal consultation process. Such measures may be added to the FMP or CMP, or to operating plans for the EFSFSR Tunnel Fishway.

Section 1

Description of the SGMP

This report provides an overview of the Midas Gold Idaho, Inc. (Midas Gold) proposed comprehensive Stibnite Gold Mitigation Plan (SGMP) for the Stibnite Gold Project (SGP or Project). This section of the report summarizes the plan goals and objectives, Midas Gold's mitigation approach, and the primary SGMP component plans and their development. Subsequent sections describe the SGP (Section 2), the regulatory and management context for the plan development (Section 3), the quantification of mitigation credits and debits into mitigation ledgers using functional analysis (Section 4), and process anticipated for SGMP revisions and implementation (Section 5). Appendix A addresses consistency with the Payette National Forest (PNF) and Boise National Forest (BNF) Land and Resources Management Plans (LRMPs).

The SGMP describes the results of considerable work Midas Gold has completed to further refine the mitigation and restoration originally described in the Plan of Restoration and Operations (PRO) (Midas Gold 2016; Appendix F). With these mitigation and design plans, Midas Gold herein demonstrates that the SGMP would achieve full compensatory mitigation required and provides a range of additional measures designed to avoid and minimize potential impacts on fisheries and wildlife during mining that go beyond required reclamation and some mitigation standards.

1.1 Goals and Objectives

Midas Gold's overarching goal for the SGP and SGMP is to design, construct, and monitor to successful completion a variety of wetland and stream restoration and enhancement, upland wildlife habitat improvements and reforestation, fish passage and access, and water quality improvement projects over the course of mine construction, operation, and closure to achieve a net ecological benefit.

The SGMP's primary objectives are as follows:

- Provide compensatory mitigation for unavoidable impacts to jurisdictional streams and wetlands due to the SGP as authorized under Clean Water Action (CWA) and to offset the SGP's authorized impacts to satisfy mitigation requirements, ensuring there will be no net loss of function of wetlands and streams resulting from construction, operation, and reclamation of the Project.
- Repair and rehabilitate habitats adversely affected by historical mining impacts in the Project area, with the primary goal of producing a net benefit to wetlands, streams, water quality, and fisheries in the Project area (Midas Gold 2016) following mining and closure.
- Implement protective mitigation and management measures to avoid and minimize potential ongoing impacts to fish and aquatic organisms during operation and closure, specifically addressing the federally listed species Snake River spring/summer Chinook salmon, Snake River Basin steelhead, and bull trout and the U.S. Forest Service (USFS) designated sensitive species westslope cutthroat trout.
- Provide upland and wildlife habitat restoration and rehabilitation to exceed Idaho standards for mineral mine reclamation and improve long-term habitat conditions for wildlife species of management importance.
- Provide upstream and downstream volitional fish passage and habitat access for anadromous and migratory salmonids (e.g., Chinook salmon, steelhead, bull trout) during mining, and restore

permanent volitional fish passage in the East Fork of the South Fork Salmon River (EFSFSR) channel to provide access to historical spawning and rearing areas for Chinook salmon and steelhead currently blocked at the cascade immediately upstream of the Yellow Pine pit lake (Figure 2-) by historical mining activity and improve habitat connectivity for bull trout.

- Implement restoration and mitigation in a manner consistent with the USFS' LRMPs for the Payette National Forest (PNF) (USFS 2003) and the Boise National Forest (BNF) (USFS 2010) and associated management prescriptions in those plans.

Related SGMP objectives are to accomplish as much mitigation onsite as possible and enhance and restore resources in areas adjacent to where impacts would occur or restore resources after completion of mining activities. Additional details on the objectives are outlined in the SGMP component plans (Rio Applied Science and Engineering [ASE] 2019a, Rio ASE 2019b, Tetra Tech 2019a; Tetra Tech 2019b).

1.2 Mitigation Approach

Midas Gold's approach to mitigation is comprehensive in that it addresses historical natural resource impacts from past mining that have reduced existing water quality and habitat function; considers expected SGP impacts on stream, wetland, and wildlife habitats; and is consistent with federal mitigation policies. While consistent with federal mitigation policy, the SGMP also meets Midas Gold's commitment to restore the Project site and achieve a net ecological benefit relative to existing conditions.

Throughout the mine planning and development process, Midas Gold has followed the process of federal mitigation policy (40 CFR Parts 1500–1508; 40 CFR Part 230 and 33 CFR Parts 325 and 332) – avoidance and minimization of potential impact through alternatives analysis and design changes, and only then compensation for remaining unavoidable impact. This process was followed from the early stages in mine plan evaluations and tradeoff studies and continues through Midas Gold's ongoing environmental analysis. These efforts are documented in Appendix G of the PRO (Midas Gold 2016), responses to requests for additional information made by USFS in 2018 and 2019, and in a Draft Wetlands Avoidance and Minimization Measures Technical Memorandum submitted to the U.S. Army Corps of Engineers (USACE) (Tetra Tech 2018a).

USFS is also assessing the potential for avoidance and minimization of impacts to waters of the United States (WOTUS) and other resources through its completed environmental impact statement (EIS) scoping and ongoing EIS alternatives evaluation processes. Midas Gold provided additional documentation to USACE for its efforts to avoid and minimize impacts to WOTUS (Tetra Tech 2018a). Coordination between USFS, EPA, and USACE has been ongoing to ensure that one of the alternatives evaluated in the EIS has the least unavoidable impacts on WOTUS that remain after avoidance and minimization measures have been applied, but that is also practicable and meets the Project purpose and need (i.e., the least environmentally damaging practicable alternative).

Midas Gold's mitigation approach is designed to be measurable and quantifiable. Three functional analysis tools were applied or developed and used – the Montana Wetland Assessment Method (MWAM) (Berglund and McEldowney 2008), the Stream Functional Assessment (SFA) (Rio ASE 2019b), and the Wildlife Habitat Functional Assessment (HFA) (Tetra Tech 2019c). The application of each of the tools resulted in the development of a ledger showing the data, calculations, and accounting of mitigation debits (loses) and credits (gained).

For impacts to wetlands and jurisdictional waters of the United States, the MWAM and SFA ledgers are both used to quantify Project-specific unavoidable impacts to and the mitigation credits or functional gain that the proposed wetland and stream compensatory mitigation. Midas Gold will submit the compensatory mitigation plan as part of its application to the USACE for a Department of

the Army (DA) permit issued pursuant to Section 404 of the CWA. Midas Gold plans to accomplish compensatory mitigation for impacts to streams and wetlands associated with the proposed SGP through permittee-responsible onsite mitigation because no mitigation banks currently exist in the Salmon River watershed and there are currently no local opportunities for in-lieu fee mitigation projects (Tetra Tech 2019a).

The SGMP was designed to be consistent with the passive and active restoration and maintenance of aquatic, terrestrial, and hydrologic resources management prescriptions for the affected management areas of the PNF and BNF. The mitigation plans are supported by multiple years of baseline data collection and analysis, evaluation of reference sites, interactions with the agencies on resource assessment methods, and continuous evaluation of options to avoid potential impacts of the SGP.

The SGMP goes beyond required reclamation and mitigation to create a net benefit on a landscape scale at the Project site after completion of mining and reclamation. The SGMP is designed to be implemented in conjunction with and integral to the redevelopment and operational plans for the SGP, as it includes early restoration and concurrent mitigation, during mining. The SGMP is also designed to be consistent with the applicable LRMPs for the PNF and the BNF, and associated management prescriptions.

1.3 Overview of the Stibnite Gold Mitigation Plan

The SGMP component plans were developed from elements described in the PRO (Midas Gold 2016). The SGMP includes three primary component plans. The relationship between the three primary SGMP component plans and these documents is shown on Figure 1 and the general development process for the SGMP is shown on Figure 2.

1.3.1 Component Plans

Conceptual Stream and Wetland Mitigation Plan (CMP)

The Conceptual Stream and Wetland Mitigation Plan (CMP) (Tetra Tech 2019a) describes Midas Gold's proposed stream and wetland mitigation designs to compensate for the unavoidable impacts on jurisdictional wetlands and other WOTUS (streams). When the CMP is finalized and submitted with its Joint Application for Permit to the USACE (404 permit), Idaho Department of Water Resources (Stream Alteration Permit), and Idaho Department of Lands (IDL), it will be referenced as and entitled the *Compensatory Mitigation Plan*. This is because the CMP is intended to satisfy the mitigation requirements of the Final Rule, Compensatory Mitigation for Losses of Aquatic Resources (aka 2008 Mitigation Rule; 33 CFR Parts 325 and 332 and 40 CFR Part 230) – no net loss of function of wetlands and streams resulting from construction, operation, and reclamation of the SGP.

Once the USACE has identified an SGP alternative that is consistent with the Clean Water Act 404(b)(1) Guidelines (40 CFR Part 230), the CMP will be updated and finalized. The final CMP document will shift from the conceptual plan to a compensatory mitigation plan and the name will change to the final Compensatory Mitigation Plan for Streams and Wetlands. It will describe the stream and wetland impacts and the mitigation proposed to compensate for unavoidable losses. The CMP contains the 12 fundamental elements required in compensatory mitigation plans as outlined in Compensatory Mitigation for Losses of Aquatic Resources (33 CFR 332).

Fisheries and Aquatic Resources Mitigation Plan (FMP)

The Fisheries and Aquatic Resources Mitigation Plan (FMP) (Brown and Caldwell [BC] and Rio ASE 2019) describes Midas Gold's proposed protective mitigation and management measures designed to avoid and minimize potential ongoing impacts to aquatic organisms, federally listed fish species,

and USFS designated sensitive species during SGP operations and closure. The FMP is different in approach from the CMP as it is not based on required compensatory mitigation and does not rely on the development of mitigation debits and credits. Rather, it is designed to also address the potential for ongoing impacts to fish and aquatic resources during mining operations and to maintain and enhance habitats not directly lost due to construction, particularly habitat for Chinook salmon, steelhead, bull trout¹, and westslope cutthroat trout². Midas Gold focused the FMP to bring together other proposed measures to avoid and minimize potential ongoing impacts to fish and aquatic resources during operations and closure. These are important elements of Midas Gold's efforts to comply with the Endangered Species Act (ESA) and improve conditions for the continued conservation of Chinook salmon, steelhead, and bull trout populations.

The FMP includes water quality protection measures, fish protection during diversions and dewatering activities, a process for mitigating for draining the Yellow Pine pit, blasting mitigation measures, and plans to monitor and maintain streamflows. In addition, the FMP includes a Fishway Operations and Management Plan (FOMP), that was developed to support the proposed EFSFSR Tunnel Fish Passage Facility (Fishway). The FMP, and the FOMP specifically, will include an adaptive management for successful completion.

The underlying mitigation for stream and aquatic habitats that would be impacted by Project construction is the restoration (re-establishment, rehabilitation, and enhancement) described in the Stream Design Report, the implementation of which is described in the CMP (Tetra Tech 2019a). Some elements of early stream and riparian restoration are included to offset some of the temporal losses to stream habitats and important salmonid habitats. These include repair and restoration of existing impacts to the wetland meadow and associated stream channel of the East Fork of Meadow Creek (aka Blowout Creek). The SGMP would rehabilitate this significant and persistent sediment source by initially restoring wetlands, preventing further streambed erosion, and separating the creek flow from sediment sources and ultimately by restoring the Blowout Creek channel.

An important element of the FMP is the early re-establishment and maintenance of volitional fish passage around the Yellow Pine pit during mining, to areas upstream of the Yellow Pine pit not currently accessible to anadromous Chinook salmon and steelhead due to historical mining impacts. Other measures include the early restoration of Blowout Creek, the development of stream diversion management and fish protection measures, and measures for maintaining instream flows.

Possibly most important is that the FMP provides a plan for active management to avoid and minimize potential impacts to federally-listed fish species and westslope cutthroat trout, and it is designed to support discussions during ESA Section 7 informal consultation. Midas Gold anticipates identifying optional or additional fisheries management measures through that process, and such measures may be added to the FMP and mine operating plans.

Wildlife Habitat Mitigation Plan (WHMP)

The Wildlife Habitat Mitigation Plan (WHMP) (Tetra Tech 2019c) describes Midas Gold's proposed plan to rehabilitate and restore upland wildlife habitats, including those previously disturbed by historical mining and wildfires and those designed to offset unavoidable impacts from the SGP. Midas Gold's Draft Reclamation and Closure Plan (RCP) (Tetra Tech 2019d) describes the concurrent reclamation during mining operation and restoration of habitat during closure of the mine as required by USFS and IDL regulations and policies. The WHMP furthers the RCP with the goal of producing a net environmental benefit for wildlife habitat in the Project area by further enhancing the ecological functions and values of the Project site beyond the reclamation requirements established

¹ These three fish species are listed as threatened under the Endangered Species Act (16 U.S.C. § 1531 et seq.).

² Westslope cutthroat trout is a U.S. Forest Service Region 4 designated sensitive species.

by the USFS and IDL. The WHMP is not based on regulatory requirements for compensatory mitigation because there is no specific mandated compensatory mitigation for upland wildlife habitats under federal or Idaho regulations.

The WHMP and its associated Wildlife Habitat Functional Assessment (HFA) quantify and document the functional analysis of wildlife and upland habitats and development to provide an objective evaluation to compare the proposed disturbances from the mine to the benefit of enhanced habitat restoration and re-establishment. This WHMP is focused on identifying appropriate voluntary compensatory mitigation for the loss or modification of upland habitat functionality associated with mining and reclamation. The approach presented in the WHMP was determined by Midas Gold and any compensatory mitigation actions presented there, or ultimately proposed to by Midas Gold, are voluntary in nature.

1.3.2 Supporting Design and Analysis

Stream Design Report

The Stream Design Report (Rio ASE 2019a) describes the overall stream enhancement and restoration approach to create permanent fish passage where currently blocked by existing mine features (i.e., cascade in the EFSFSR) upstream of the existing Yellow Pine pit lake), restore high-quality stream channels over the top of proposed mine features at closure, and enhance habitat and passage in select streams that would be otherwise unaffected by mining. It explains the purpose of the stream restoration designs; summarizes the methods, assumptions, analyses, and rationale used to develop and support the stream designs; and describes stream enhancement and restoration sequencing as it relates to the mine operations timeline. The primary goals are to improve habitat conditions for aquatic species, mitigate for project impacts, and reclaim and/or restore streams and floodplains disturbed from historical and proposed mining activities.

Wetland Restoration Design

Appendix D of the CMP [Tetra Tech 2019a]) provides the advanced conceptual design details of proposed integrated stream and wetland designs. Based on the proposed disturbance footprint and proposed stream restoration, wetland restoration would focus on creation and establishment of three general wetland types according to landscape position: (1) valley margin wetlands, (2) riverine wetlands as riparian fringe and floodplain wetlands, and (3) depressional wetlands as groundwater discharge wetlands. Each of these wetland types is further broken into one of four wetland vegetation classifications: palustrine emergent, palustrine scrub-shrub, palustrine forested, and palustrine aquatic bed. Each of these wetland types and their vegetation classifications are further described in the CMP.

East Fork South Fork Salmon River (EFSFSR) Tunnel Feasibility Design Report

This report describes the proposed EFSFSR tunnel design and components of the proposed fishway with 30% design drawings (McMillen Jacobs 2018a). This document culminated from a design process that included the development of several supporting engineering, biological, hydrologic, and geotechnical evaluations (appended to McMillen Jacobs 2018a), including:

- EFSFSR Fish Passage Design Criteria and Preliminary Alternatives Analysis (McMillin Jacobs 2018b)
- Analysis of Streamflows and Fish Passage in the EFSFSR, and Implications for the Design of Fishway in the Proposed EFSFSR Diversion Tunnel (Paradox Natural Resources and BioAnalysts 2018)
- Potentially Relevant Criteria for Downstream Fish Passage in the EFSFSR Tunnel around Yellow Pine Pit (Paradox Natural Resources 2018)

- 15% Design Alternatives Analysis – Fish Passage Components of the EFSFSR Tunnel (TM6) (McMillin Jacobs 2018c)
- Analysis of streamflow hydrology for the EFSFSR at the tunnel (Rio ACE 2018)
- Preliminary geotechnical evaluation for the tunnel portals and channels (McMillin Jacobs 2018d)

The goal of the process was to design a tunnel that includes a fishway for both upstream and downstream volitional fish passage, restoring access to areas upstream of Yellow Pine pit for migratory salmonids early in the SGP and for the first time since 1938. The report describes the results of a fish passage methodology alternatives analysis and preliminary hydraulic modeling for the proposed fishway in the EFSFSR tunnel constructed to convey water around the Yellow Pine pit during mine development, operations, and subsequent environmental restoration. The tunnel would be decommissioned after the EFSFSR has been restored over the top of the backfilled Yellow Pine pit. The general process for dewatering the Yellow Pine pit and minimizing potential effect on federally-listed species is described in the FMP, and the process of restoring the EFSFSR across the backfilled Yellow Pine pit is described in the Stream Design Report (Rio ASCE 2019a).

During ongoing ESA informal consultation during 2018-2019, Midas Gold consulted with the agencies, particularly the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) (together, the “Services”) on the proposed fishway design. Subsequently, Midas Gold developed the FOMP (BC and BioAnalysts 2019; in Draft) to supplement the engineering design and provide details on the startup, operation, management, and monitoring of the fishway. Together, the fishway design report (McMillen Jacobs 2019a) and the FOMP constitute a complete design package that will be reviewed by the USFS and the Services.

1.3.3 Functional Assessment Tools and Debit/Credit Ledgers

Central to developing a measurable and quantifiable mitigation plan is the ability to quantify ecological functions losses (debits) and gains (credits) to document the changes in ecological function that will be achieved through appropriate and practicable restoration, establishment, enhancement, and/or preservation. Midas Gold developed and applied separate functional assessments for wetlands, streams, and wildlife habitats.

Stream Functional Assessment (SFA) Methodology Report and Stream Functional Assessment Ledger

The SFA (Rio ASE 2019b) was developed as an adaptation of the USFS’s Watershed Condition Indicator (WCI) Matrix (Appendix B in USFS 2003) that reflects important stream functions and values related to fish species of interest in the PNF, specifically Chinook salmon, steelhead, bull trout, and westslope cutthroat trout. The SFA is used in the SGMP to assess habitat quality and quantity over the life of the proposed Project using structural and functional values combined to yield functional units of measure, for debits associated with stream impacts and credits associated with proposed stream mitigation. The SFA Report includes multiple appendices that fully describe the basis for the SFA, the methodology, and the resulting Stream Functional Assessment Ledger (SFA Ledger).

The results of the stream functional assessment were integrated into a Microsoft Excel spreadsheet ledger that enables the transparent accounting and tracking of impacts (debits) and compensatory mitigation (credits) over time. The SFA Ledger divides all affected jurisdictional streams into unique reaches, aggregates all SFA element scores into a reach functional index (quality), and multiplies each reach functional index by the length and size (based on stream order) of the reach to calculate the functional value of each reach in terms of functional units (quality and quantity). The result is a common unit of measurement (a functional unit) applied to each reach, enabling comparison

between reaches over time. This process has also been repeated for different time periods including existing (baseline), interim (impacted during mining operations), and restored (post-mining) for the life of the Project and out-years allowing a year-by-year evaluation of impacts versus mitigation.

Montana Wetland Assessment Method (MWAM) and Wetland Functional Assessment Ledger

In consultation with USACE, Midas Gold is assessing wetland function using the MWAM (Berglund and McEldowney 2008). The MWAM is a functional assessment approach for quantifying wetland impacts and mitigation that is regionally appropriate for Idaho. USACE agrees that MWAM is an acceptable method to quantify functional values wetlands for the Project (HDR 2016a).

The Montana Wetland Assessment Method (MWAM) produces a unitless numeric value for each wetland assessment area (AA) analyzed. This numeric value is multiplied by the acreage of the AA to produce a functional unit. Through this process, acres of wetlands within the AA that are disturbed can be converted to functional units of wetlands that are lost and would need to be replaced via the compensatory mitigation process. Likewise, the same MWAM is used to create a unitless numeric value for wetlands that are enhanced, restored, or created to satisfy compensatory mitigation. The functional units generated via this process can be used to compensate for those that are impacted by Project disturbance. To track the impacted functional units and those that are part of the compensatory mitigation process, Midas Gold developed a comprehensive spreadsheet ledger that accounts for each wetland delineated across the Project site and offsite areas and the functional units associated with each of those wetlands. This spreadsheet also accounts for the functional units that are predicted to be associated with the restored wetlands across the mitigation area.

The detailed conceptual design plans for the stream, wetland, riparian, and upland wildlife habitat restoration discussed in the SGMP and its component plans are based on the design reports cited above and Appendix D of the CMP and, in the case of wildlife habitat restoration, are in the WHMP. These reports provide the basis for future detailed designs during implementation and for calculating the estimated loss of habitat functional values (debits) and, in the case of compensatory mitigation, gains in habitat functional values (credits).

Wildlife Habitat Functional Assessment (HFA)

The HFA will ultimately attribute Habitat Functional Units (HFUs) to upland habitats as a common currency to compare the functional value of habitat disturbed during mining to the functional value of habitat restored during reclamation or enhanced, restored, or created through voluntary compensatory mitigation actions. The loss and gain of HFUs is being accounted for using a ledger system consistent with the stream and wetland mitigation ledgers to transparently quantify and track impacts and mitigation needs over time.

Section 2

Project Description

Midas Gold plans to redevelop portions of the historic Stibnite Mining District, as outlined in the PRO (Midas Gold 2016). Midas Gold submitted the PRO to meet the requirement for a plan of operations for approval by USFS for use of the surface of National Forest System lands under regulations at 36 CFR 228 Subpart A—Locatable Minerals, and to meet the requirements for a plan of operations for approval by the IDL under state regulations and Idaho code (Surface Mining Act [1971] and IDAPA 20.03.02, Rules Governing Exploration, Surface Mining, and Closure of Cyanidation Facilities). The PRO was submitted to USFS and IDL in September 2016 and was determined to be complete by USFS in December 2016.

The Project is in Valley County approximately 92 air miles (144 miles by road) northeast of Boise, Idaho, 44 air miles northeast of Cascade, Idaho, and 10 air miles east of Yellow Pine, Idaho (Figure 1-1). The Stibnite Gold Mitigation Plan includes three primary component plans and supporting restoration design reports, with benefits quantified by ecological functional analyses and debit-credit ledgers to track impacts and compensatory mitigation over time.

Figure 1-2. Schematic showing the process of development of the Stibnite Gold Mitigation Plan and its components as well as closely associated development of functional assessments, designs, plans, and Endangered Species Act (ESA) informal consultation.

Figure 2-). The following terms are used throughout the SGMP and its component plans:

- **Project area** includes all Project features, including both the mine area (Project site) and offsite infrastructure.
- **Project site** includes the mine area (Figure 2-).
- **Offsite infrastructure** includes all infrastructure and facilities outside of the mine area, including roads, transmission lines and line upgrades, and support facilities (Figure 2-).

The Project site includes Midas Gold’s private lands (patented claims) and unpatented mining (lode) and mill site claims located on BNF and PNF land that is administered by the USFS PNF Krassel Ranger District. The broader Project area includes the Project site as well as additional USFS land on which related site activities and offsite infrastructure facilities will occur.

The Project site occurs primarily within the EFSFSR drainage basin. The EFSFSR is joined by Johnson Creek 16 miles downstream near Yellow Pine and flows into the South Fork of the Salmon River approximately 14.5 miles downstream of the Johnson Creek confluence. Major tributaries in the EFSFSR basin include Sugar Creek, Meadow Creek, Johnson Creek, Riordan Creek, Burntlog Creek, Trout Creek, Hennessy Creek, Midnight Creek, Fiddle Creek, Garnet Creek, and Rabbit Creek, with West End Creek a tributary of Sugar Creek. The Project area also includes the Cabin Creek and Warm Lake Creek drainage basins, which drain to the South Fork of the Salmon River.

2.1 Plan of Restoration and Operations (PRO)

In the PRO, Midas Gold proposes to economically develop and operate a modern mining operation at the Project site to obtain financial return and benefits from its property rights and investment and supply extracted minerals for various uses. The redevelopment of the Project site will entail: a resumption of open-pit mining; ore processing; recovery of gold, silver, and antimony; placement of

neutralized tailings in a composite-lined tailings storage facility; development rock placement in fully engineered and designed facilities; and supporting infrastructure.

The Stibnite Mining District represents an area of previous mining operations spanning over 100 years (Figure 2-), and Midas Gold proposes to reclaim and improve upon the existing conditions of historically impacted areas, as well as recover and reprocess old tailings and the existing waste materials such as development rock and spent heap leach ore. Both concurrent and post-operations closure and reclamation will be undertaken. The closure and reclamation costs will be borne by Midas Gold, but supported by a financial assurance sufficient to cover the costs of third parties completing this work if, for any reason, Midas Gold does not.

The PRO includes a description of life-of-mine construction, operations, reclamation, and post-closure activities. A summary timeline of PRO activities is illustrated graphically in Figure 2-. Project site mine features and supporting facilities (

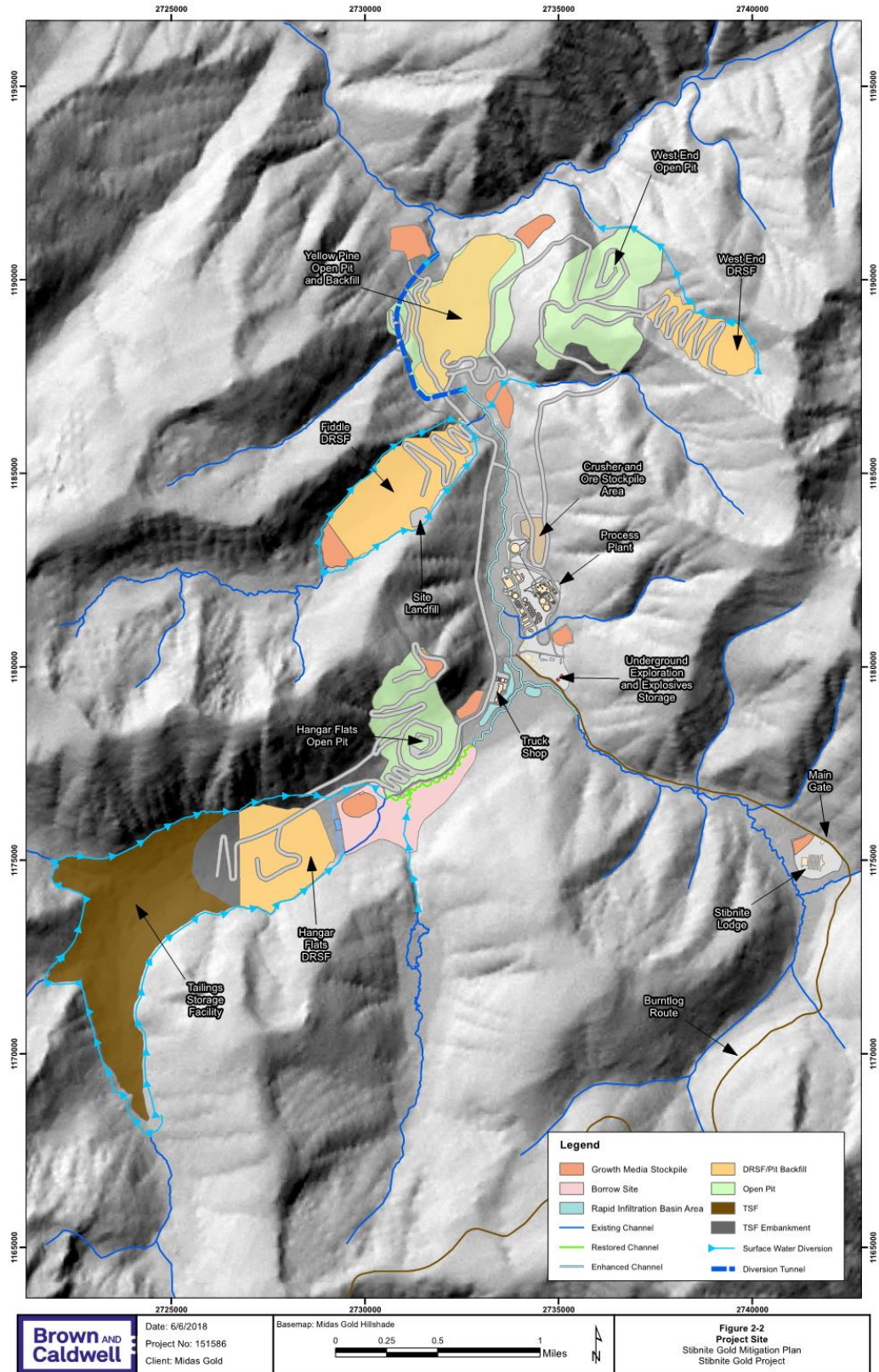


Figure 2-4), and offsite (Project area) infrastructure facilities that support mine operations (Figure 2-) are also described.³ A summary of the PRO components is provided below.

Activities/processes described in the PRO and the estimated durations over which they would occur (Figure 2-) are as follows:

- Pre-mining development construction, including offsite infrastructure and preliminary reclamation/mitigation activities, pre-stripping of open pit areas, and limited mining and stockpiling of ore (3 years)
- Open-pit mining, ore processing, existing tailings removal and reprocessing, exploration drilling and concurrent reclamation/mitigation/restoration (12–15 years)
- Reclamation and closure (5+ years)
- Post-closure mitigation and monitoring

Project site mine features and facilities to support mining operations (Figure 2-) are as follows:

- Three open pits (Yellow Pine pit, West End pit, Hangar Flats pit)
- Development rock storage facilities
- A composite-lined tailings storage facility
- Temporary growth media stockpiles
- Haul roads and access roads
- Surface water diversions and impoundments including EFSFSR tunnel
- Groundwater extraction (dewatering wells) and associated rapid infiltration basins
- Ore processing facilities and material storage areas/structures
- Maintenance and administrative facilities
- Worker housing facility
- Sanitary waste and solid waste handling facilities
- Communications facilities
- Groundwater monitoring wells
- Security facilities and fencing

Offsite infrastructure facilities (Figure 2-) are as follows:

- Primary mine access road, the Burntlog route
- Electrical transmission line extension (Johnson Creek substation to Project Site)
- Existing electrical transmission line upgrade (Lake Fork to Cascade to Johnson Creek substation)
- Landmark Maintenance Facility
- Stibnite Gold Logistics Facility

Existing mine features and disturbance area at the Project site are illustrated in Figure 2-. The PRO avoids and minimizes new surface disturbance by preferentially locating Project features in areas of prior disturbance. Within the Project area, approximately 40 percent of the disturbance footprint of the proposed mine site features and associated offsite infrastructure and facilities occurs on land that is previously disturbed or currently in use.

³ The activities on Figure 2- are depicted in the earliest possible year of implementation. Actual implementation will be phased to accommodate site construction activities, material availability (earth, rock, and vegetation), lodging for workforce, mine plan, and general leveling of contractor and internal resources.

Within the Project site, these disturbances are associated with prior mining activities and include unreclaimed mine pits, access and haul roads, development rock and spent ore piles, tailings storage areas, town sites, support facilities, and an airstrip. Proposed offsite infrastructure facilities also use existing and historical disturbance areas, including the use and upgrading of existing roads for the primary mine access road (Burntlog route), and following the existing transmission line right of way corridor for all upgraded transmission line and most of the new transmission line.

One noteworthy existing mining impact that will be addressed by Midas Gold during operations and after mining is the fish passage barrier at the cascade immediately upstream of the Yellow Pine pit lake (Figure 2-). The stream gradient here exceeds 20 percent and the cascade includes impassable falls and drops.

2.2 Restoration of the Stibnite District

The Stibnite Mining District has been subject to extensive mining-related activities by prior owners over the past century (Figure 2-). Historically affected areas within the Stibnite Mining District provide a unique opportunity for a modern mining operation to also restore existing environmental impacts from historical mining activities through additional mining and comprehensive site restoration.

Historical mining activities included underground and open-pit mining, heap leaching, ore processing in a mill, smelting, tailings disposal, development rock disposal, waterway diversions, dam construction (and subsequent failure), town and camp sites, haul roads, power lines, landfills, etc. These human impacts have been compounded by extensive forest fires that have burned approximately 76 percent of the Project mineral holdings area. Such activities have resulted in widespread impacts on the natural environment including deforestation, accelerated erosion, increased sedimentation, elevated metals loading in surface water and groundwater, diversion and degradation of natural waterways (including the EFSFSR), blockages to anadromous and migratory fish passage, impaired water quality, and compromised fish habitat, waterways, and wetlands.

In the PRO, Midas Gold addresses the substantial majority and largest of the historical impacts at the Project site, in conjunction with the resumption of mining operations and redevelopment of the site. Some key objectives of Project site restoration include addressing existing mining impacts, restoration of fish habitat, restoration of the East Fork of Meadow Creek (aka Blowout Creek), and re-establishment of volitional upstream and downstream passage in the tunnel around the Yellow Pine pit followed by permanent fish passage in the restored channel over the backfilled Yellow Pine pit.

2.3 Mining and Restoration Sequence

The general sequence of mining, restoration, closure, and reclamation is illustrated on Figure 2-5. Midas Gold has also considered the timing of proposed impacts, and when possible has moved proposed restoration projects earlier in the life of the mine to minimize the extent of potential impacts to fish species within the Project site. Refer to the CMP (Tetra Tech 2019a) and Stream Design Report (Rio ASE 2019a) for more details. In their Response to RFAI-57 Stream Management During Operations (BC 2018), Midas Gold provides a description of the sequence of impacts on stream channels and the timing of their restoration, including 19 maps showing the year-by-year progression.

Section 3

Regulatory and Management Context

3.1 U.S. Forest Service Approval and National Environmental Policy Act Compliance

In compliance with the National Environmental Policy Act (NEPA), the PNF is the lead federal agency preparing an EIS to evaluate and disclose the potential environmental effects from the approval of the PRO (Midas Gold 2016) to occupy and use National Forest System lands for operations associated with open-pit mining and ore processing, which may also require related amendments to the PNF LRMP (USFS 2003) and/or the BNF LRMP (USFS 2010). Midas Gold anticipates that the SGMP and its component plans may change as the USFS proceeds through the EIS process, resulting from changes to the Proposed Action. The consistency of the SGMP with the PNF and BNF Forest Plans and their management prescriptions is discussed in Section 5.

Additionally, the SGP must obtain other federal and Idaho approvals and permits. These regulatory requirements and their relevance to mitigation planning are presented briefly below.

3.2 Department of the Army Permit, Pursuant to Clean Water Act, Section 404 and Section 401

The SGP would result in discharges of fill materials and permanent impacts to wetlands and other WOTUS (streams) and therefore is subject to regulation under Section 404 of the CWA. Midas Gold plans to file an application with the USACE for a DA permit issued pursuant to Section 404 of the CWA. USACE's Regulatory Division administers the Section 404 program, and the U.S. Environmental Protection Agency (EPA) oversees its implementation. Both are cooperating agencies in the development of the EIS.

Midas Gold is coordinating closely with the USACE Regulatory Division—Walla Walla District through the Boise Field Office for adherence to the CWA 404/DA permit process, stream and wetland delineations and jurisdictional determinations, development of the SFA for USACE-approved stream functional assessment, wetland and stream credits and debits determinations, and compliance with USACE's 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material ((40 CFR Part 230). Midas Gold and USACE will coordinate with the Idaho Department of Environmental Quality (IDEQ) so the SGP complies with the applicable provisions of Section 401 of the CWA and Idaho water quality standards, which would result in IDEQ's issuance of CWA Section 401 water quality certification for the SGP.

The CMP documents that the SGMP meets the requirements of the Compensatory Mitigation for Losses of Aquatic Resources rules (33 CFR Parts 325 and 332 and 40 CFR Part 230) that there would be no net loss of function of wetlands and streams resulting from construction, operation, and reclamation of the SGP.

USACE is cooperating on the preparation of the EIS and will evaluate the EIS content to ensure it can be adopted by USACE to support an eventual decision to either issue, issue with conditions, or deny a DA permit for the SGP. The adequacy of the SGMP, particularly the CMP, will be an important consideration in the USACE's permit decision.

3.3 Clean Water Act, Section 402

The SGP would result in point source discharges to WOTUS and it is anticipated that a new National Pollutant Discharge Elimination System (NPDES) permit would be required. Whether issued by EPA or IDEQ, the new NPDES or Idaho Pollutant Discharge Elimination System (IPDES) permit would consider the mitigation proposed by Midas Gold to the extent that it affects the achievement of water quality standards during construction, operations, and closure. EPA and IDEQ are cooperating agencies in the preparation of the EIS and will evaluate the EIS content to ensure it can be adopted in support of the decision-making process for issuance of a discharge permit under Section 402 of the CWA. Mitigative actions by Midas Gold would improve stream conditions and water quality, so they are relevant considerations in the issuance of the discharge permit and 401 Water Quality Certification.

3.4 Endangered Species Act

The SGP will undergo review and require formal consultation under Section 7 of the ESA, as it may affect federally-listed threatened and endangered species. USFS is the lead federal agency for the ESA consultation, and the Services are the action agencies.

Understanding that the SGP may affect federally listed species and/or modify their designated critical habitat (DCH), Midas Gold has built measures for the enhancement and management of DCH for these federally listed species into the SGMP. The Stream Design Report specifically focused on the habitat requirements and preferences of Chinook salmon, steelhead, and bull trout (Rio ASE 2019a), and the FMP includes measures to avoid and minimize potential impacts on these species and westslope cutthroat trout during mining and reclamation (BC and Rio ASE. 2019).

Midas Gold has been designated by the lead federal agency as the non-federal representative for consultation under the ESA and as having "Applicant" status under ESA for the SGP. During 2018 and 2019, Midas Gold has been actively engaged in Section 7 informal consultation with the USFS, the Services, and other participating agencies.

The FMP describes Midas Gold's proposed protective mitigation and management measures for fisheries and aquatic resources during operations and closure (BC and Rio ASE 2019). Midas Gold anticipates identifying optional or additional fisheries management measures through the ESA informal consultation process. Such measures may be added to the FMP or CMP, or to operating plans for the EFSFSR Tunnel Fishway.

3.5 Magnuson-Stevens Fishery Conservation and Management Act

In addition to compliance with ESA, USFS is required to comply with the Magnuson-Stevens Fishery Conservation and Management Act on actions that might adversely affect essential fish habitat (EFH), including habitats that fish rely on throughout their life cycles, requiring consultation with NOAA Fisheries. EFH encompasses habitats necessary to allow enough production of aquatic species with commercial value to support a long-term sustainable fishery and contribute to a healthy ecosystem, including spawning and rearing habitats. EFH is coincident with designated critical habitat for Chinook salmon in Project area watersheds. EFH consultations are typically combined with existing environmental review procedures, such as those required under the NEPA and the ESA.

Section 4

Functional Analysis, Mitigation Debit/Credits, and Mitigation Ledgers

Central to the process of developing a measurable and quantifiable mitigation plan is the ability to understand the amount and ecological functions of impacted habitats as well as the offsetting amount and ecological function that will be achieved through appropriate and practicable restoration, establishment, enhancement, and/or preservation. This section of the SGMP summarizes the methods Midas Gold used to account for the ecological functional value of habitat losses due to mining and habitat gains due to restoration.

The SGMP is supported by multiple years of baseline data collection and analysis, evaluation of reference sites, review and integration of relevant current literature, and interactions with the responsible federal, state, local, and tribal agencies. Midas Gold is putting forth a mitigation plan that is scientifically based, quantified, and transparent.

The process for developing baseline resource delineation, completing the functional analysis, developing estimates of mitigation debit and credits, and developing mitigation ledgers that track debits and credits over time during mining, reclamation, and restoration is illustrated in Figure 6-1 and can be described according to the following steps:

- Baseline studies to identify and delineate stream, wetland, and wildlife habitat resources
- Rigorous alternatives and siting process to avoid and minimize impacts of the SGP, focused on impacts on WOTUS
- Calculation of the resource impact remaining after all practical avoidance and minimization
- Assessment of the ecological functional values of the existing resource before impacts
- Calculation of functional losses (debits) due to unavoidable impacts
- Design of stream, wetland, and upland wildlife restoration, enhancement, and rehabilitation projects
- Calculation of functional gains (credits) due to restoration projects
- Tracking the debits (impacts) and credits (restoration) in a common ecological currency (functional units)
- Establish mining sequence and impact/restoration sequence so that temporal impacts can be tracked
- Tabulation of debits and credits in a stream ledger, wetland ledger, and wildlife habitat ledger illustrating temporal changes in loss and gain of habitat functional values

4.1 Baseline Resource Delineation—Jurisdictional Streams and Wetlands and Wildlife Habitats

Wetland and stream (non-wetland WOTUS) baseline information was collected through surveys and has been reported in the Wetland Resource Baseline Study and its addenda (HDR 2013, 2014a, 2014b, 2015, 2016a-b, 2017a; Tetra Tech 2018b-d).

Wetland and upland habitats have been described in the Vegetation Baseline Study (HDR 2017a). Stream ordinary high-water mark delineations were conducted concurrently with the wetland delineations by HDR from 2011 to 2016 (HDR 2013, 2014a-b, 2015, 2016, 2017a) and other areas were assessed by aerial photo interpretation in 2018 (Tetra Tech 2018b-d).

USACE uses jurisdictional determinations (JDs) to assess which waters fall under the jurisdiction of Section 404 of the CWA. An approved JD (AJD) indicates if waters are WOTUS. A preliminary JD (PJD) indicates that there may be WOTUS present and assumes that those waters are jurisdictional until an AJD indicates otherwise (USACE and EPA 2008). The JD process is largely completed for the SGP, and all wetlands and streams potentially affected by the project will be covered under an AJD or a PJD.

Extensive aquatic resources baseline data were collected from relatively undisturbed reference streams and mining-impacted streams throughout the Project area over the period 2012–2017 (HDR 2016; MWH 2017; Stantec 2018). Stream geomorphology and hydrology studies were conducted in reference streams and Project site streams during 2017 (Rio ASE 2019a) and additional surveys were completed by Great Ecology during 2017 to collect stream data for the SFA. Additional details can be found in those reports and the FMP.

To describe baseline habitat conditions, the WHMP uses data from previous wildlife baseline studies for the Project site (Strobilus Environmental 2017; Garcia and Associates 2014), the proposed Burntlog route expansion, and part of the transmission line corridor found within the national forests. Data from previous wildlife baseline studies for the Project were coupled with data from interpretation of aerial imagery and photographs.

4.2 Calculate Resource Impacts

Following appropriate and practicable avoidance and minimization, the impacts of the SGP on jurisdictional streams and wetlands and on upland wildlife habitats were determined by overlaying the mine disturbance footprint over the delineated resources. Figure 6-2 shows existing streams and wetlands overlapping anticipated permanent disturbance at the Project site.

More detailed mapping and accounting of wetland and stream impacts are presented in the CMP and its appendices, including impacts anticipated at offsite facilities and infrastructure disturbance such as the primary mine access road (Burntlog route), electrical transmission line, and logistics facility. Wetlands impacts were mostly in the upper EFSFSR watershed, followed by the Johnson Creek watershed. Palustrine forested wetlands make up the greatest percentage of impact, followed by palustrine scrub-shrub, palustrine emergent, and open water wetlands. Impacts on jurisdictional streams would be mostly on perennial streams and would be greatest in the upper EFSFSR watershed, followed by the Johnson Creek watershed, as these watersheds have the greatest density of Project disturbance. Impacts on ephemeral and intermittent streams would be considerably less and would occur mostly (by length) in the upper EFSFSR watershed. For further details, see the CMP (Tetra Tech 2019a) and its appendices. Similar methods were used in the WHMP but focusing on Geographic Information System (GIS) overlay analysis the suitable habitat for wildlife species.

4.3 Assess Functional Value for Wetlands, Streams, and Wildlife Habitats

The 2008 Mitigation Rule recommends that a functional or conditional assessment be completed at the impact site to quantify ecological losses (debits) and at the mitigation site to quantify projected ecological gains (credits), which would be realized if the mitigation project is successfully implemented (33 CFR 332.3(f)(1)). Credits generated at the mitigation site should offset the debits estimated at the impact site to achieve no net loss of habitats and their functions. Functional valuation has been widely used for quantifying stream and wetland impacts and debits/credits (Harman et al. 2012; Hruby 2012; Johnson et al. 2013, 2016; USACE 2017) and is consistent with the 2008 Mitigation Rule.

4.3.1 Functional Assessments Used in the SGMP

Three functional assessment procedures were used in the SGMP to quantify ecological losses (debits) and gains (credits) in terms of both habitat quantity and habitat quality (Figure 6-1).

- The functional assessment used in the CMP for wetlands was the existing MWAM (Berglund and McEldowny 2008). This functional assessment tool has been used in the Walla Walla District and is regionally appropriate. The USACE Regulatory Division—Walla Walla District recognizes MWAM as an acceptable method to quantify mitigation for unavoidable impacts to wetlands from the SGP (HDR 2016). Details of the application of MWAM for functional analysis of wetlands are included in the CMP (Tetra Tech 2019a).
- For streams, Midas Gold worked with USFS and cooperating agencies to develop an SFA for the Project area streams, and the details of the SFA development and application are reported in the Stream Functional Assessment Methodology Report (Rio ASE 2019b). The SFA is based on an adaptation of the regionally calibrated WCI Matrix (USFS 2003) that reflects important stream functions and values related to fish species of interest in the PNF and BNF (Chinook salmon, steelhead, bull trout, and westslope cutthroat trout). The WCI matrix evaluates stream function by measuring elements reflecting water quality, habitat access, channel conditions and dynamics, flow and hydrology, and watershed conditions. The WCI was derived from precursor methods developed by USFWS (1998) and NOAA Fisheries (National Marine Fisheries Service 1996) for evaluating habitat conditions in salmonid streams in the Salmon River Basin and the Pacific Northwest and was adapted to parallel similar methods as described in Function-Based Framework for Stream Assessment and Restoration Projects (Harman et al. 2012) and Stream Functions Pyramid Framework (Harman and Jones 2016).
- For upland and wildlife habitat, Midas Gold's team developed a functional assessment methodology to measure ecological value of upland wildlife habitat to quantify the expected benefits of the proposed upland wildlife habitat rehabilitation, replacement, and restoration. The HFA (Tetra Tech 2019c) quantified the ecological habitat function of areas, or stands, of each cover type, represented by distinct GIS polygons, by assigning each stand a score based on the provision of key habitat resources wildlife need to survive (food, cover, and structure).

Midas Gold used these functional assessment methods as the scientific tools to robustly assess and measure projected changes to habitat conditions over time. They allow the quantification of existing ecological function of given habitat types and areas, thus enabling Midas Gold and regulatory agencies to calculate the amount of ecological function lost (debits) due to impacts from the SGP and to establish the amount of benefit in ecological function (credits) that can be gained from restoration activities. This ensures that an appropriate amount of mitigation is being proposed to compensate for unavoidable impacts by the SGP.

For compensatory mitigation for impacts to wetlands and WOTUS required under the 2008 Mitigation Rule, the credits and debits are used quantitatively, to ensure replacement with no net loss. In the case of the WHMP, the debits and credits are used more for qualitative and demonstrative purposes to show the level of mitigation achieved in ecological functional units.

4.4 Calculate Functional Value of Lost and Restored Habitats

Simply put, the functional value of a lost habitat is the length or area of the habitat multiplied by its functional score. The result is called a functional unit (FU) and it is the currency of the habitat credits and debits.

Baseline (or existing condition) stream FUs were calculated by dividing the affected jurisdictional streams into unique reaches, quantifying and aggregating WCI element scores for each reach into a reach functional index (FI), then multiplying by the length of the reach and a stream order weighting factor to calculate the functional value of each reach in terms of functional units. The result is a single score (the functional unit) for each reach, enabling apples-to-apples comparison between reaches (Rio ASE 2019b; Tetra Tech 2019a).

Baseline FUs were calculated similarly for wetlands but by using the MWAM functional score and wetland area (Tetra Tech 2019b). Baseline upland wildlife habitats were also based on the area of each habitat type multiplied by the wildlife habitat functional analysis score. Through this process, the baseline functional units of the resources to be lost were calculated for streams, wetlands, and upland wildlife habitats. The process described above was repeated to calculate the stream, wetland, and upland wildlife habitat FUs that would be replaced by Midas Gold's proposed restoration, enhancement, and re-establishment projects. The new length and/or area for proposed conditions was calculated then multiplied by the estimated functional value of those proposed habitats. The estimates of proposed length, area, and functional condition were made based on the conceptual designs (Rio ASE 2019a; Appendix F in Tetra Tech 2019a; Tetra Tech 2019c, in progress).

For upland wildlife habitats, the analysis focused on representative wildlife species that use key habitats and quantifying project impacts on the specific vegetation types, canopy cover classes, and tree size classes with which these species are associated. By defining the existing level of habitat quality, the analysis developed a baseline or reference point from which Project impacts and mitigation offsets were quantified.

4.5 Track Debits and Credits in Mitigation Ledgers

The mitigation ledgers are spreadsheets used for recording and totaling transactions measured in terms of FUs, with debits and credits in separate columns and showing the change in the balance over time and the ending balance. Three separate mitigation ledgers—stream, wetland, and upland wildlife habitat—were developed and allow Midas Gold and the regulatory agencies to transparently quantify and track impacts and mitigation needs over time.

4.6 Mining and Restoration Sequences—Temporal Accounting of Debits and Credits

The mitigation ledgers also track habitat functional losses and gains over time. The mining and restoration sequences were defined to show activities each year of mine construction, operation, and closure (Tetra Tech 2019a). For the compensatory mitigation for impacts to wetlands and streams, the ledger allows a year-by-year evaluation of impacts versus mitigation, or temporal accounting of mitigation debits and credits.

Section 5

Plan Revision and Implementation

This section describes how the SGMP will be revised and updated throughout the NEPA and permitting process. It describes the integration of the plan into the Environmental and Monitoring Management Plan (EMMP) and provides a preliminary determination of consistency of the SGMP with the PNF (USFS 2003) and BNF Forest Plans (USFS 2010).

5.1 SGMP Revisions

The PNF is the lead federal agency preparing the EIS to evaluate and disclose the potential environmental effects from: (1) approval of the Project to occupy and use National Forest System lands for operations associated with open-pit mining and ore processing and (2) related amendments to the PNF LRMP (USFS 2003) and/or the BNF LRMP (USFS 2010).

As previously described, this SGMP is specifically proposed for the Project as described in the PRO (Midas Gold 2016) and is intended to be included in the USFS' EIS for the Project. While it is proposed for the PRO, it is also largely applicable to mitigation needs associated with other alternatives that the USFS plans to consider in the Draft EIS. This is because many of the project elements and potential impacts would be similar among alternatives. However, the final mitigation plans will need to be revised to address modifications to the proposed Project or as a different alternative is identified in the draft EIS by the USFS as the preferred alternative⁴. Midas Gold anticipates that the SGMP and its component plans will be revised between the draft EIS and final EIS to address these changes.

Midas Gold is concurrently coordinating closely with the USACE Regulatory Division—Walla Walla District, Boise Field Office, on compliance with the Clean Water Act Section 404/Department of the Army permit process, stream and wetland delineations and jurisdictional determinations, development of the stream functional assessment for USACE-approved stream functional analysis, wetland and stream credits and debits determinations, and compliance with USACE's 404(b)(1) Guidelines (40 CFR Part 230).

Midas Gold also anticipates its mitigation plan may be updated or revised as ESA Section 7 informal consultation continues. For this reason, some of the elements of the SGMP and component plans are conceptual now and will only be refined or completed at the point at which the specifics of the final mitigation plan are known. See the individual CMP, FMP, and WHMP for additional information.

5.2 SGMP Implementation

Regardless of the final details of the final SGMP, the proposed restoration would be undertaken in conjunction with and integral to the redevelopment and operational plans for the Project. As generally shown in Figure 2-, restoration and mitigation and management of fisheries and aquatic resources would start early in the mining process and would extend throughout the 12-year to 15-year mining period and beyond, into the post-closure and monitoring period. Examples of early

⁴ 40 CFR 1502.14 - Alternatives including the proposed action, specifies that the draft EIS identify the agency's preferred alternative or alternatives, if one or more exists, in the draft EIS and identify such alternative in the final EIS unless another law prohibits the expression of such a preference.

mitigation projects would include the re-establishment of volitional fish passage in the EFSFSR tunnel around the Yellow Pine pit, ongoing planting for reforestation of historical mining and fire disturbance and projects like the restoration of the wetland meadow and stream of the East Fork of Meadow Creek (aka Blowout Creek).

There are several elements of the implementation of the SGMP that are not fully fleshed out in the component plans that will be developed more fully later, after the publication of the draft EIS and public comment period. These include the following:

- Monitoring and maintenance
- Performance standards
- Adaptive management
- Long-term management
- Financial assurances

Each of these elements will be more fully addressed at the appropriate time, when the SGMP is closer to its final form and after the agencies and public have been provided an opportunity to comment on the EIS and the SGMP.

The requirements for these elements will vary by the component plans, the responsible agency, and the guiding regulations. For example, the CMP addresses each of the 12 required elements of mitigation compensatory plans (33 CFR 332.4(c)/40 CFR 230.94(c)): objectives, maintenance plan, site selection, performance standards, site protection, monitoring requirements, baseline information, long-term management plan, determination of credits, adaptive management plan, mitigation work plan, and financial assurances. Other restoration commitments are managed in other ways, such as commitments made to address measures to minimize impacts on federally listed species described in the FMP.

5.3 Environmental Monitoring and Management Plan (EMMP)

Midas Gold is developing an EMMP as a functional management and compliance tool for mine management, of which this SGMP and its component plans would be an integral part.

5.4 Forest Plan Consistency Review

USFS regulates the mining of locatable minerals on National Forest System lands and requires an approved plan of operations for all such mining. Implementation of the PRO requires USFS approval for those portions applicable to National Forest System lands. Consequently, USFS will evaluate aspects of the PRO to ensure that they are consistent with the land and resources management objectives and the rights granted through statutes, leases, and licenses and that lands disturbed by mineral and energy activities are reclaimed for other productive uses consistent with forest LRMPs (USFS 2006).

Midas Gold reviewed the LRMPs for the PNF and BNF and their associated management prescriptions for the BNF/PNF generally and for the affected management units (Appendix A). The review specifically included the management prescriptions for Management Area 13: Big Creek/Stibnite, as most Project impacts and associated mitigation actions lie within this management area. Midas Gold found that the SGMP was consistent with the passive and active restoration and maintenance of aquatic, terrestrial, and hydrologic resources management prescriptions. Further detail is provided in Appendix A.

The SGMP is judged to be consistent with the PNF and BNF Forest Plans and their management prescriptions; however, some modifications of the SGMP may be needed or beneficial.

Section 6

Limitations

This document was prepared solely for Midas Gold in accordance with professional standards at the time the services were performed and in accordance with the contract between Midas Gold and Brown and Caldwell dated January 1, 2018. This document is governed by the specific scope of work authorized by Midas Gold; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by Midas Gold and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Further, Brown and Caldwell makes no warranties, express or implied, with respect to this document, except for those, if any, contained in the agreement pursuant to which the document was prepared. All data, drawings, documents, or information contained in this report have been prepared exclusively for the person or entity to whom it was addressed and may not be relied upon by any other person or entity without the prior written consent of Brown and Caldwell unless otherwise provided by the Agreement pursuant to which these services were provided.

Section 7

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Section 8

Figures

Figure 1-1. The Stibnite Gold Mitigation Plan includes three primary component plans and supporting restoration design reports, with benefits quantified by ecological functional analyses and debit-credit ledgers to track impacts and compensatory mitigation over time.

Figure 1-2. Schematic showing the process of development of the Stibnite Gold Mitigation Plan and its components as well as closely associated development of functional assessments, designs, plans, and Endangered Species Act (ESA) informal consultation.

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Figure 2-2. Project Site

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Figure 6-2. Project Site Stream and Wetland Impacts (from Tetra Tech 2019a)

Figure 6-3. Example Conceptual Stream and Wetland Restoration Design

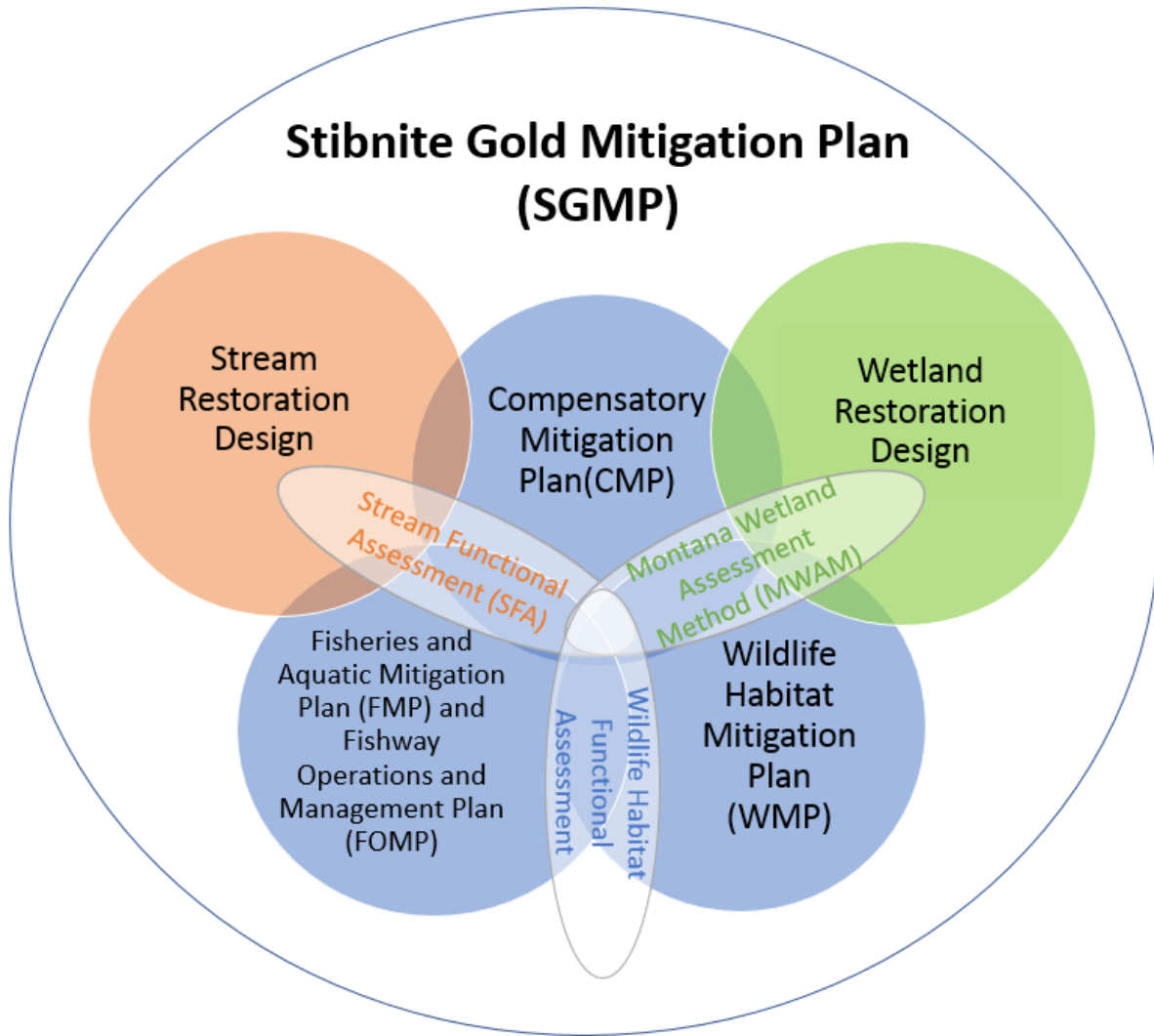


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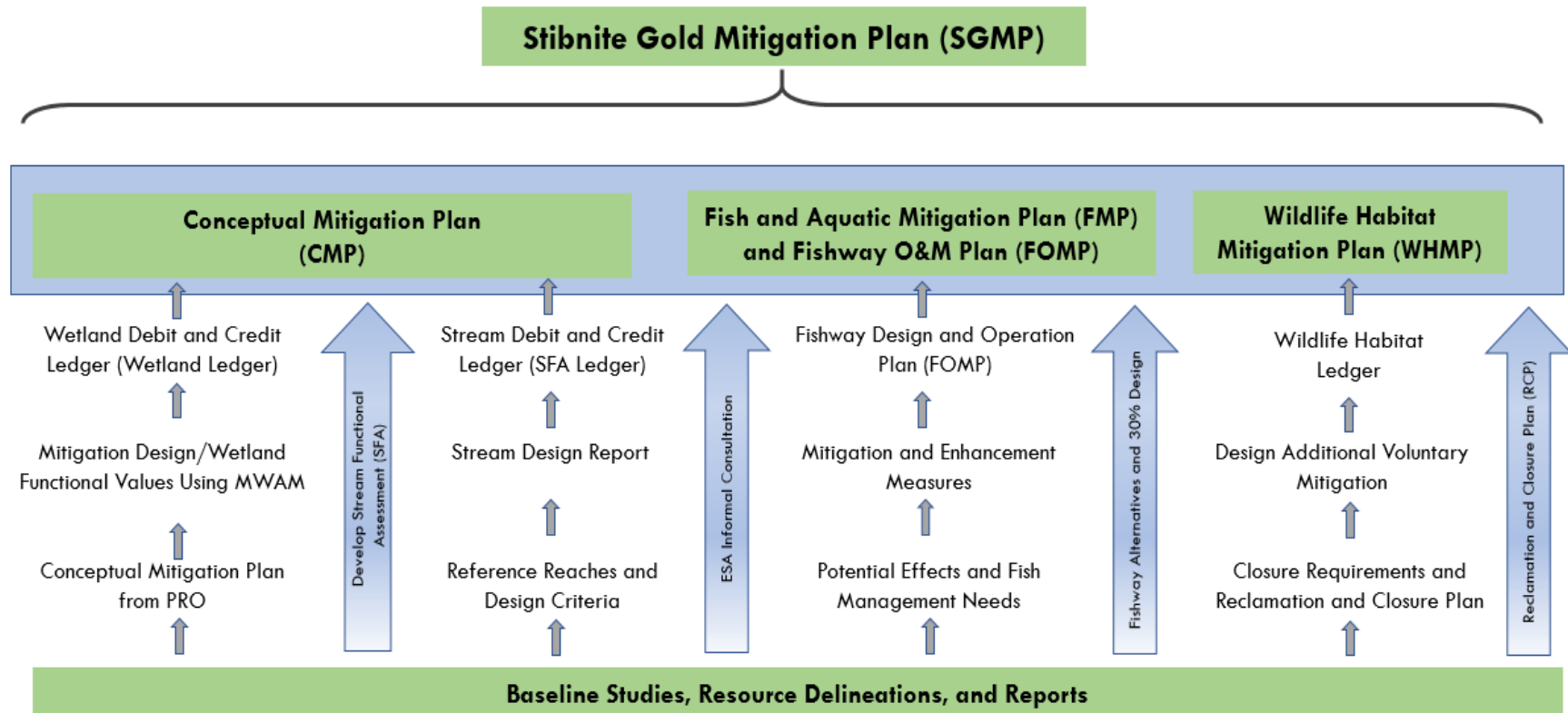


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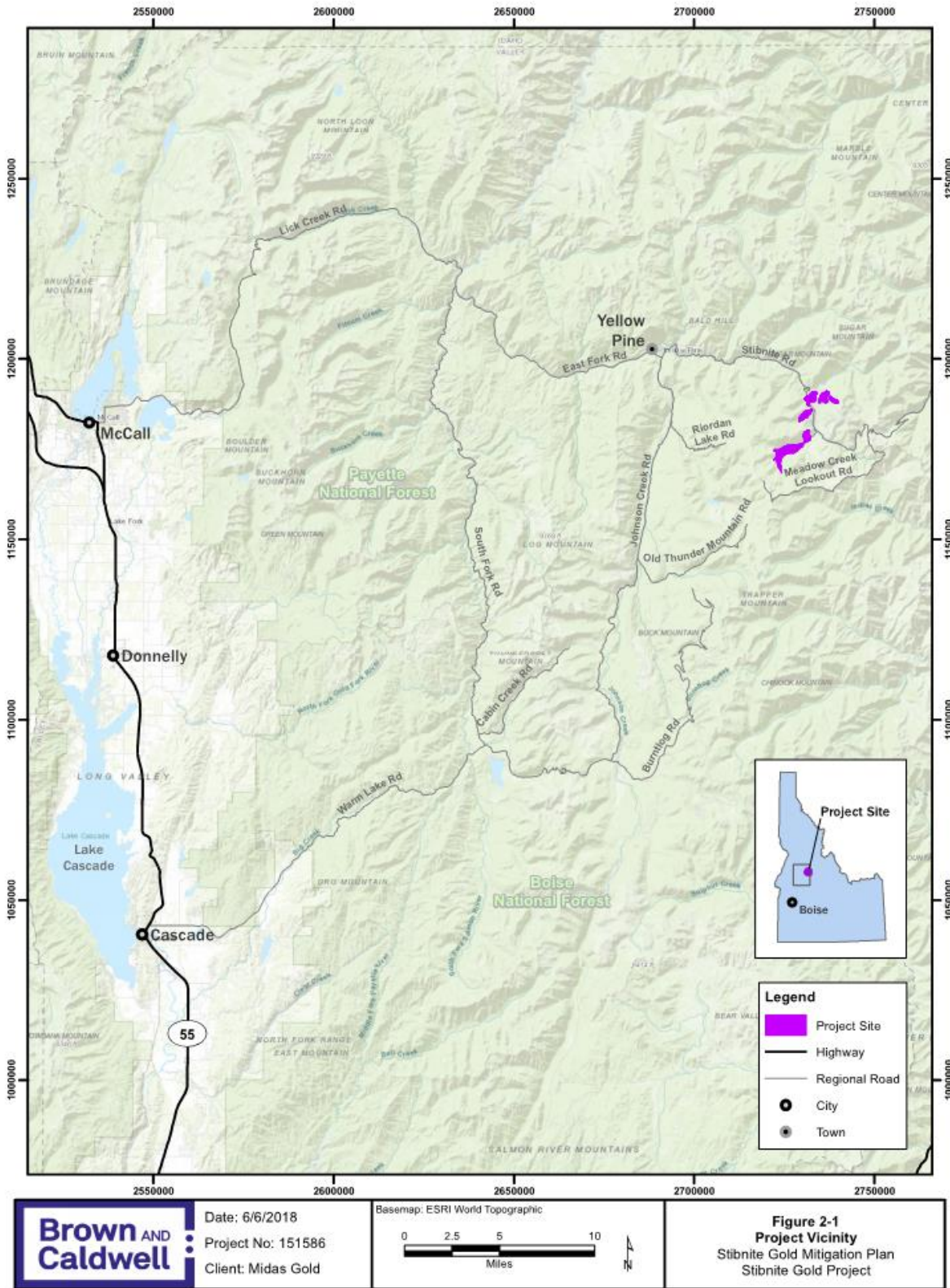


Figure 2-3. Project Vicinity

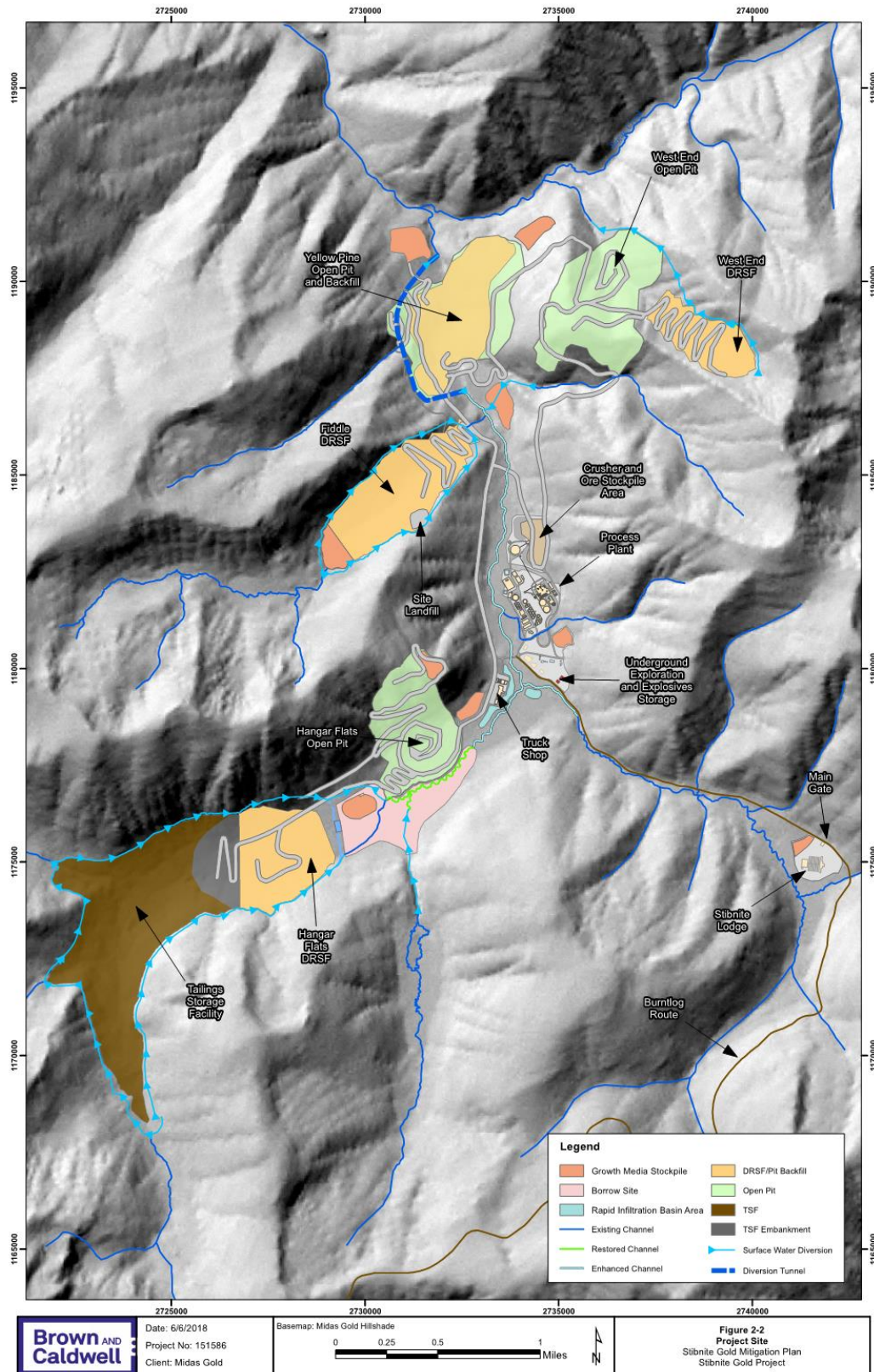


Figure 2-4. Project Site

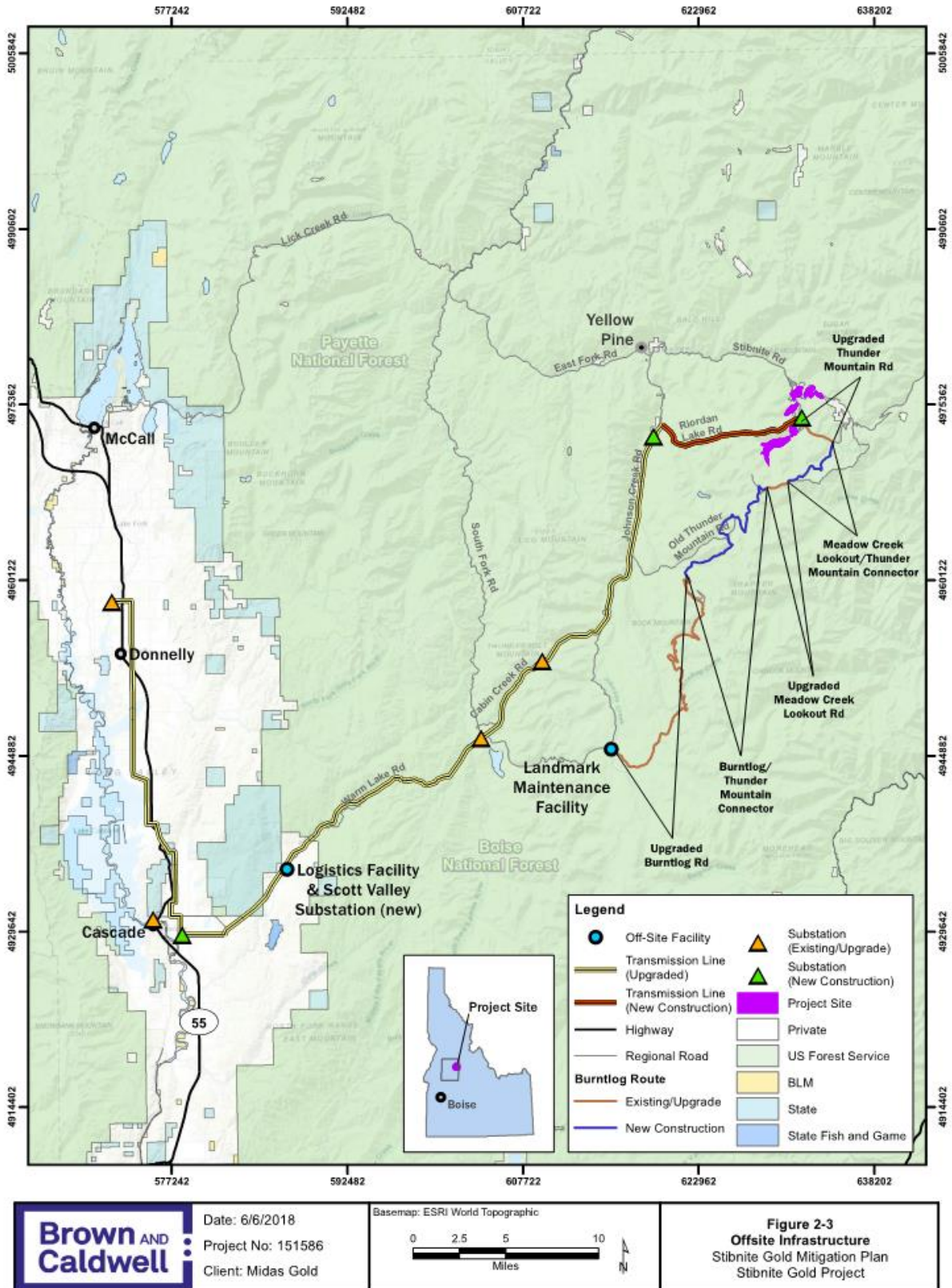


Figure 2-5. Offsite Infrastructure

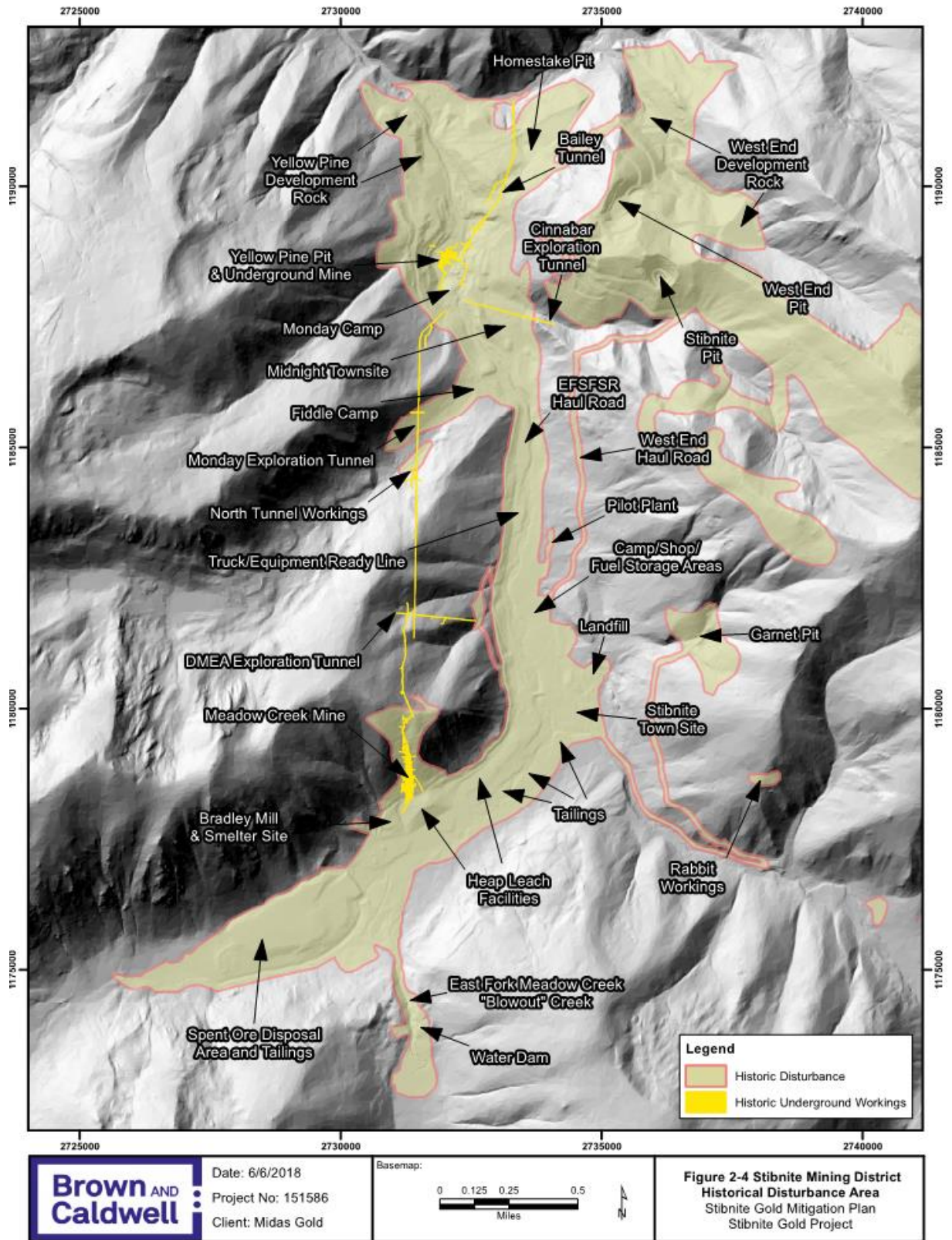


Figure 2-6. Stibnite Mining District Historical Disturbance Area

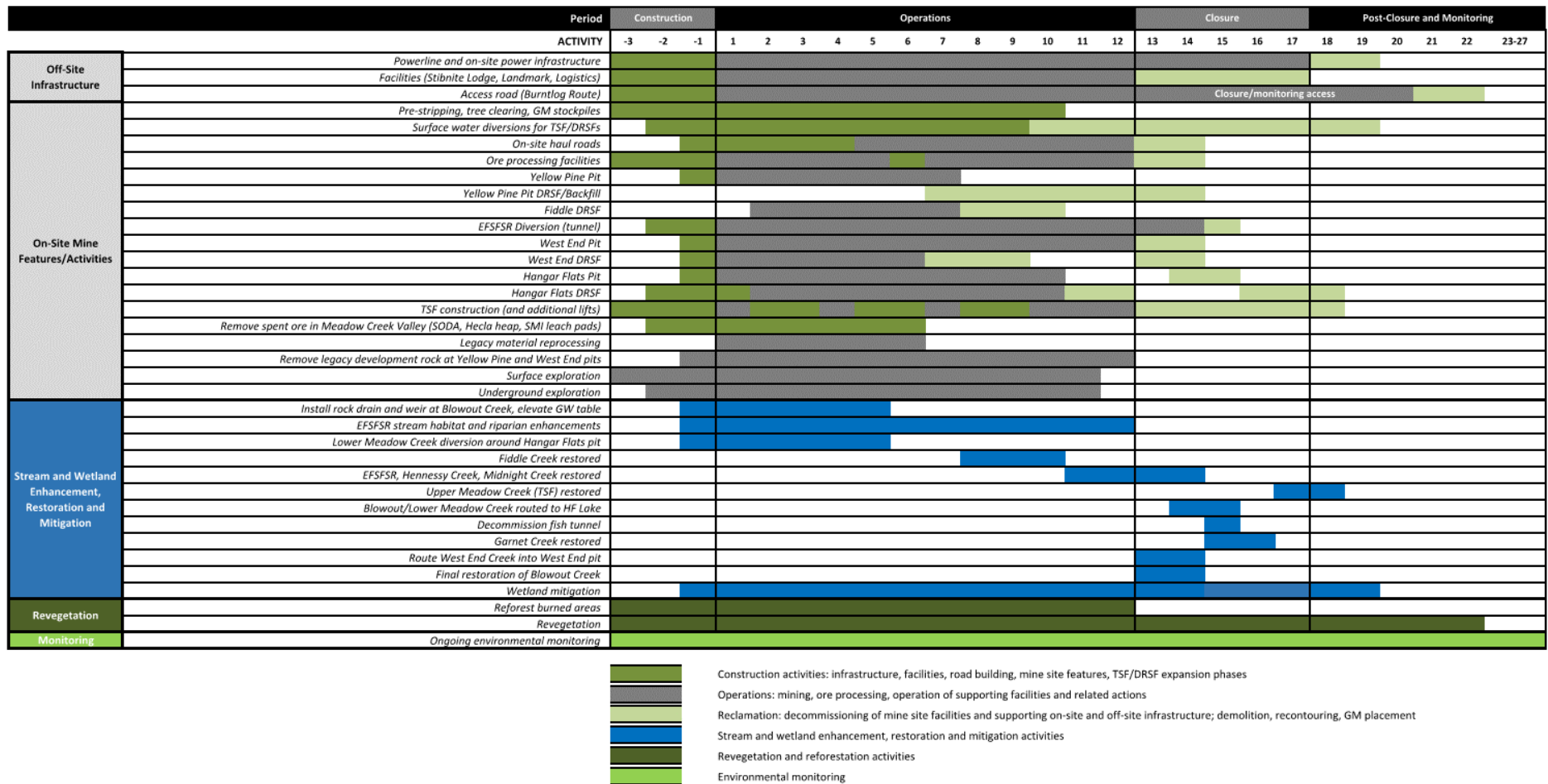


Figure 2-7. General Sequence of Mining, Restoration, Closure, and Reclamation





Figure 2-8. Cascade Upstream of the Yellow Pine Pit Representing a Barrier to Upstream Fish Passage

Stibnite Gold Mitigation Plan

Functional Analysis, Mitigation Debit/Credits, and Mitigation Ledgers

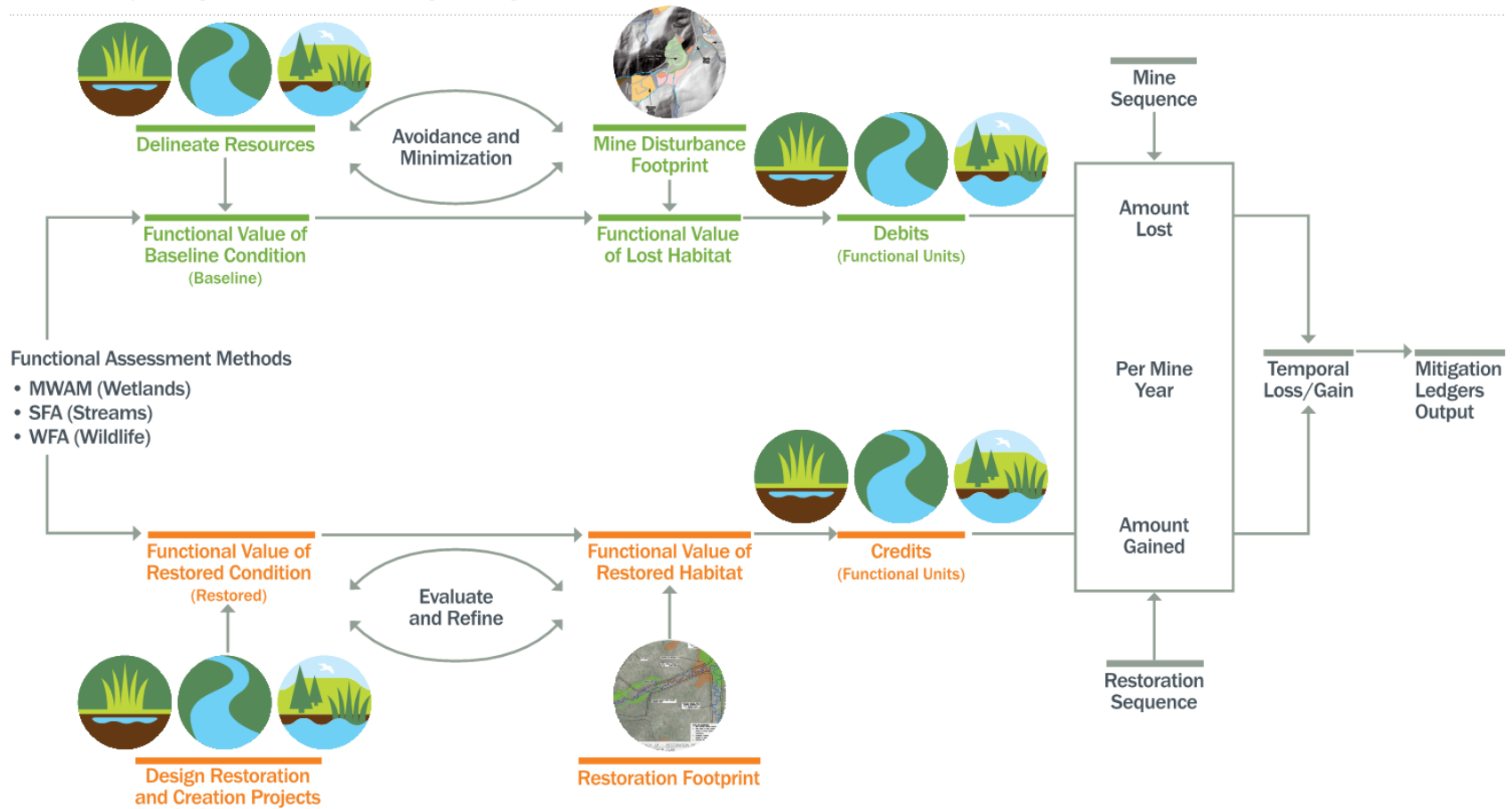


Figure 6-1. SGMP, Functional Analysis, Mitigation Debit/Credits, and Mitigation Ledgers

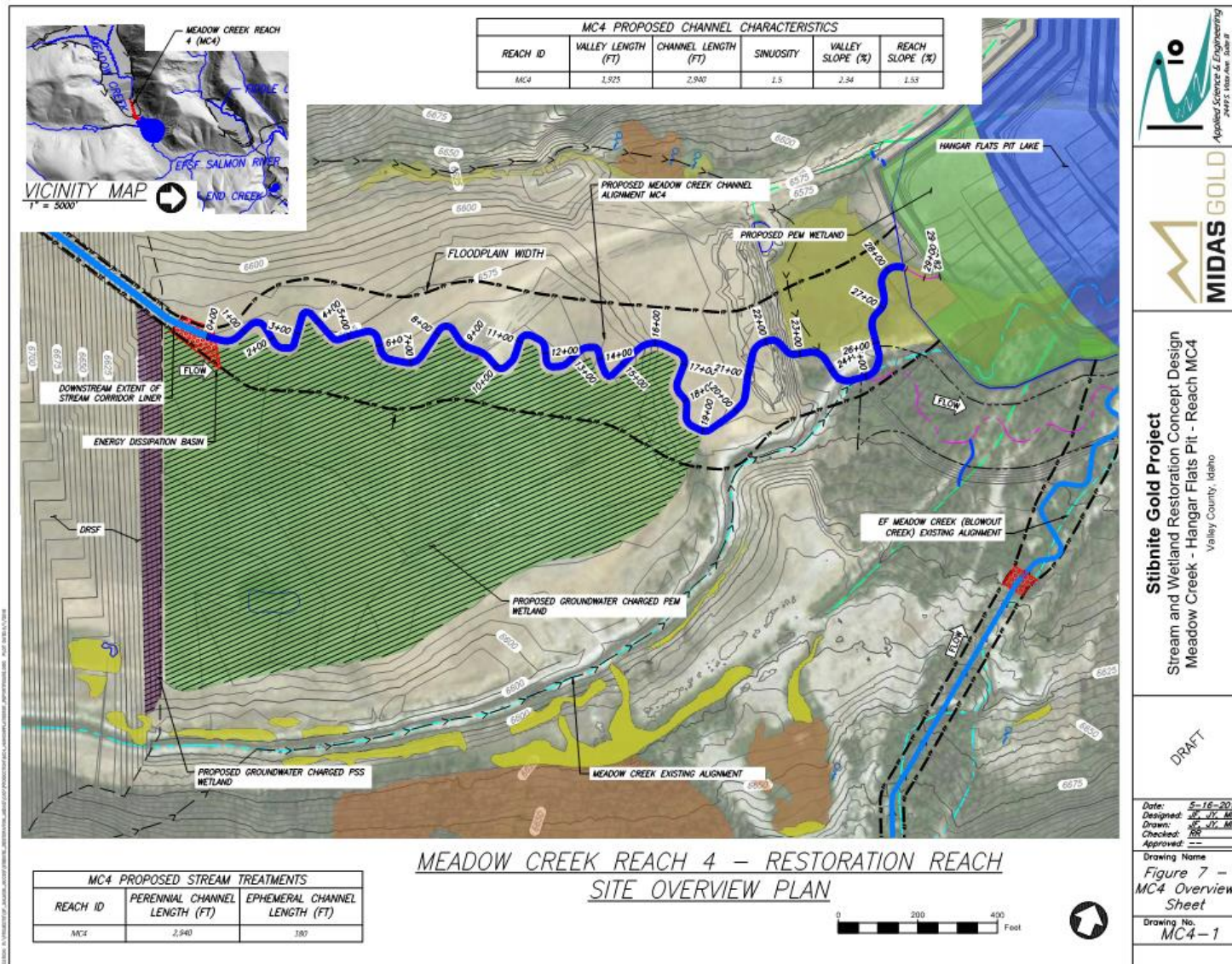


Figure 6-3. Example Conceptual Stream and Wetland Restoration Design

Appendix A: Consistency of the Stibnite Gold Project with the Payette and Boise National Forest Plans

Appendix A

Consistency of the Stibnite Gold Project with the Payette and Boise National Forest Plans¹

The National Forest Management Act regulations require that National Forest Land and Resources Management Plans (hereafter referred to as “Forest Plans”) be updated or revised every 10 to 15 years. The Payette National Forest (PNF) Forest Plan was revised in 2003 and the Boise National Forest (BNF) Forest Plan was revised in 2010. These Forest Plans guide natural resource management activities on lands administered by the U.S. Forest Service (USFS) and describe management goals and objectives, resource protection methods, desired resource conditions, and the availability and suitability of lands for resource management. The purpose of the Forest Plan is to provide management direction to ensure sustainable ecosystems and resilient watersheds capable of providing a sustainable flow of beneficial goods and services to the public (USFS 2003, 2010).

Since 1992, USFS has adopted Ecosystem Management (EM) as an operating philosophy, and this approach guides the objectives and goals of the Forest Plans. An EM approach shifts the management away from a single resource or species-specific focus, towards a focus on ecosystems and landscapes (USFS 2003, 2010). Midas Gold Idaho, Inc., is taking a similar ecosystem-wide approach with the Stibnite Gold Mitigation Plan and its component plans—integrating proposed mitigation and restoration measures across landscapes. The mitigation and restoration actions involving stream and wetland resources described in the Fisheries and Aquatic Resources Mitigation Plan (FMP) and Conceptual Stream and Wetland Mitigation Plan (CMP), such as in-stream aquatic habitat restoration and riparian plantings, will have ancillary benefits to terrestrial and upland wildlife species in the form of providing forage, nesting, cover, and breeding habitat. Similarly, the proposed upland wildlife habitat mitigation efforts will result in enhancement and reclamation of a variety of grassland, shrubland, and forest habitat types—vegetative communities that not only provide foraging, breeding, cover, and nesting habitat for upland wildlife species but will also improve water quality of aquatic habitats by stabilizing soils, providing shade, and reducing erosion.

Furthermore, the Forest Plans identify management prescriptions for specific areas (Management Areas) throughout PNF and BNF. In PNF, the Project area, part of Burntlog route (part of the upgraded Thunder Mountain Road), and a length of the transmission line fall within the following PNF Management Area and Management Prescription Categories:

- Management Area 13: Big Creek/Stibnite O
 - Category 3.1: Passive Restoration and Maintenance of Aquatic, Terrestrial and Hydrologic Resources (Inventoried Roadless Area)
 - Category 3.2: Active Restoration and Maintenance of Aquatic, Terrestrial and Hydrologic Resources and Non-Forest System Lands (Inventoried Roadless Area)

The relevant Management Areas in BNF are as follows:

¹ Prepared by Great Ecology (2018).

- Management Area 17: North Fork Payette (Transmission Line)
- Management Area 19: Warm Lake (Transmission Line)
- Management Area 20: Upper Johnson Creek (Burntlog route)
- Management Area 21: Lower Johnson Creek (Transmission Line)

Of all the Management Areas, the majority of Project and associated mitigation actions lie within Management Area 13: Big Creek/Stibnite. Listed below are goals and objectives that USFS has listed in the PNF Forest Plan for soil, water, riparian, and aquatic resources. Immediately below each management objective is how the SGMP is consistent with or would help work toward achieving the USFS objectives.

- Maintain and restore habitat for threatened species and maintain habitat for listed fish species.
 - Midas Gold is making extensive efforts to first avoid, then minimize impacts to listed fish species. Furthermore, as part of the CMP, Midas Gold will restore stream habitat throughout the Project site, stabilize Blowout Creek, and restore fish passage above Yellow Pine pit.
- Restore or maintain riparian area composition, structure, and function by improving riparian vegetation and hydrology function through decommissioning or obliterating roads within riparian areas and returning road surfaces, cuts and fills to productivity.
 - Upon cessation of mining activities, most roads within the Project area, including portions of the Burntlog route, will be reclaimed and restored to natural habitat. In addition to elimination of roads, proposed stream restoration and enhancement projects throughout the site will restore riparian vegetation, improving composition, structure, and function over existing conditions.
- Improve water quality by reducing impacts from accelerated sediment and chemical contamination in areas of concern—such as Upper EFSFSR drainage, including the Sugar Creek and Upper EFSFSR watersheds.
 - Midas Gold’s reprocessing of historical tailings, reuse of spent heap leach ore, and the proposed stabilization of Blowout Creek will improve water quality by removing sources of potential sedimentation and contamination from the upper EFSFSR watershed (Midas Gold 2016).
- Reduce impacts to riparian areas from recreation sites or uses.
 - Midas Gold will be planting and restoring all riparian areas within the Project area impacted by mining activities.
- Restore fish habitat degraded from past mining activities in the upper EFSFSR drainage, including Sugar Creek and upper EFSFSR subwatersheds.
 - Midas Gold would restore fish habitat in streams affected by historical mining and would restore fish passage above the Yellow Pine pit—allowing upstream passage to upper EFSFSR and Meadow Creek for the first time since 1938 (Midas Gold 2016).
- Assist in de-listing the EFSFSR from the Idaho’s impaired water bodies list by applying appropriate and active watershed restoration to reduce sediment and metals contamination, which are the identified pollutants of concern.
 - The water quality improvement activities discussed above may assist in de-listing the EFSFSR and tributaries.