Midpeninsula Regional
Open Space District

R-22-145
Meeting 22-30
December 14, 2022

AGENDA ITEM 7

AGENDA ITEM

Approval of Addendum to the Final Program Environmental Impact Report for the Wildland Fire Resiliency Program and Related Minor Project Modifications

GENERAL MANAGER'S RECOMMENDATION

Adopt a resolution approving the Addendum to the certified Final Program Environmental Impact Report for the Wildland Fire Resiliency Program and related minor project modifications.

SUMMARY

The Board of Directors (Board) certified the Final Program Environmental Impact Report (FPEIR), Mitigation Monitoring and Reporting Plan (MMRP) and adopted the Wildland Fire Resiliency Program (Program) on May 12, 2021, (R-21-58, Minutes). The complete FPEIR is available on the Midpeninsula Regional Open Space District's (District) website at www.openspace.org/fire. The Program was adopted with the understanding that staff would develop the details of the Prescribed Fire Plan (PFP) before implementing that portion of the Program. The District has since refined the PFP, incorporating feedback from stakeholders and the public, where appropriate. The minor modifications were presented to the Board at the October 2022 study session.

The attached Addendum to the 2021 FPEIR analyzes the minor modifications and inclusions to the Program, as required by the California Environmental Quality Act (CEQA), and finds that no significant effect on the environment will result from these changes (Exhibit A to the resolution - Addendum to the 2021 FPEIR).

BACKGROUND

In May 2021, the District's Board certified the Final Program Environmental Impact Report (FPEIR) and adopted the Wildland Fire Resiliency Program (Program). All documentation for the Program can be found on the District's website (R-21-58). The Program directly responds to a growing need for proactive wildland fire management in partnership with sister agencies and residents. California's fire season is now longer and more intense due in part to the dense regrowth of historically heavily logged forests, more than a century of fire suppression, an increase in home construction adjacent to or within wildland areas, and a changing climate with increasingly extreme weather patterns. These factors necessitate additional measures to reduce the risk of a catastrophic fire. Catastrophic fires in wildland areas can severely damage, if not destroy, sensitive habitats and the natural resources that the public has entrusted the District to protect and restore.

Wildland Fire Resiliency Program

The activities under the approved Program apply to all lands managed by the District, located in unincorporated portions of San Mateo, Santa Clara, and a small section of Santa Cruz counties and within or near 17 cities. The Program serves as a planning and implementation document that fully describes and integrates the following four plans:

- *Vegetation Management Plan*: Addresses the creation and maintenance of fuel reduction areas for ecosystem health, as well as fuel breaks and defensible space zones, using vegetation management techniques that include manual and mechanical removal of vegetation, limited use of herbicides, and prescribed herbivory.
- *Prescribed Fire Plan (PFP)*: Programmatically addresses the methods and implementation of prescribed fire to manage fuel and improve ecosystem health. The PFP in the Program description provided a high-level framework for implementing prescribed fire on District lands. A summary of the refined PFP is presented in this board report. Board feedback received at the October 26, 2022, meeting was incorporated into the PFP.
- *Wildland Fire Pre-Plan/Resource Advisor Maps*: Resource Advisor maps prepared for each preserve and other District-managed lands (or groups of managed lands) include information on existing conditions, infrastructure, and resource constraints. These maps aid fire suppression activities and identify sensitive resource areas that merit protection from potential damage due to fire or fire suppression activities.
- *Monitoring Plan*: Provides a framework for recording pre-project conditions, vegetation treatment response, and fuel inventories to inform future adaptive management techniques.

Prescribed Fire Plan

Prescribed fire is one of the essential tools used to manage natural resources and fire risk. Prescribed fire uses a scientific prescription, prepared in advance, that describes the objectives, fuels, size, the precise environmental conditions under which a fire would be initiated, and conditions under which it would be suppressed. If weather conditions or forecasts vary from the prescribed conditions, then active prescribed fire operations cease. Conditions are closely monitored. Fire may be allowed to burn to existing control lines or, if deemed necessary, actively suppressed. Active suppression may commence at the request of either the Burn Boss[1] or the District representative.

Prescribed fire can be designed to create a mosaic of diverse habitats for plants and animals. The use of fire allows for the germination of fire-obligated or culturally significant species, controls invasive species to help rare and endangered species recover, or reduces fuels and thereby prevents a more destructive fire during adverse weather conditions (e.g., high winds, high temperatures).

[1] A certified burn boss has final authority to approve and amend the a prescribed fire plan and formula applicable to a prescribed burning operation, to determine that the site has been prepared and the crew and equipment are ready to commence the operation, and to supervise the work assignments of crew until the prescribed burning is completed and all fire is declared to be out.

DISCUSSION

Summary of Prescribed Fire Plan Refinements

The District has refined the PFP and incorporated the feedback from stakeholders and the public, where appropriate, into the PFP. The refined PFP includes more specifics relevant to burn planning and implementation in the following areas:

- Burn objectives
- Assumed vegetation types
- New control lines
- Public notification process (see below)
- Annual number of burns
- Pre-treatment activities
- Identification of burn units
- Burn ignition

See Attachment 1: Prescribed Fire Plan Description for further details.

Objectives

The proposed PFP includes the following four primary burn objectives beyond the Program Objectives:

- *Ecosystem Restoration Burns* - restore fire as a natural ecological process;
- *Fuel Reduction Burns* - reduce dead surface fuels and fine fuels such as litter, duff, branches, and logs;
- *Traditional Ecological Knowledge (TEK) Burns* - conducted in collaboration with local Tribal Representatives to protect, restore, or facilitate improved production or collection of specific culturally significant plants, trees, or seeds; and
- *Training Burns* - train District employees and cooperating agencies.

It is important to note that a single burn may include multiple objectives that are not mutually exclusive; in most cases, multiple objectives will be met in a single burn.

Stakeholder Engagement and Public Notification, Education, and Information Sharing

A critical component in the prescribed fire process is notifying and educating stakeholders during the planning, implementation, and monitoring phases. The Public Outreach and Notification section of the Prescribed Fire Plan Description (Section 3 of Attachment 2) has been clarified since first presented at the October 26, 2022, study session with the Board to expand upon the notification process. Further details are also provided below.

Key stakeholder engagement, including outreach to local Town and City staff/elected bodies, will normally start prior to the finalization of a burn plan. During the planning phase, key stakeholders will be provided an opportunity to provide input into the plan within their area of expertise or purview and as appropriate. Inclusion of any input into a burn plan is at the sole discretion of the burn boss, who is the final authority to approve and amend a burn plan, with concurrence from the District.

The notification process to remind and inform the community about scheduled burns starts once the District's Resource Advisor has identified a potential location(s), objective(s), fire agency partner(s), and burn window. The District would implement several notification methods during public outreach and notification for all future burns. Table 3-3 in Attachment 2 provides a checklist of the required burn notification and public outreach methods.

Under the advisement of or in consultation with the local emergency services and fire agencies, the District may conduct expanded notification to the community using local and regional communication tools and methods (e.g., local and regional social media channels, including requesting support from surrounding Cities and Towns to transmit notifications via their communications channels). This may also involve requesting assistance from local partner agencies (e.g., California Department of Transportation for roadside signs, transmitting notifications via local CalFire/emergency response communications channels) to support additional outreach leading up to and including the day of a prescribed fire.

The public is additionally encouraged to sign up for the appropriate interested parties list (e.g., Wildland Fire) to stay informed of upcoming activities, including prescribed burns. The public can visit https://www.openspace.org/opt-in to be added to the appropriate list. See section 3.7: *Stakeholder, Public Outreach, and Notification* (pages 18 – 20) of Attachment 1: Prescribed Fire Plan Description for details.

FISCAL IMPACT

Resolution approving an addendum to the Final Program Environmental Impact Report for the Wildland Fire Resiliency Program and related minor project modifications has no direct, immediate fiscal impact.

BOARD AND COMMITTEE REVIEW

On June 27, 2018, the Board authorized the General Manager to enter into a contract with SIG to provide fire ecology services (R-18-72, Minutes).

On October 24, 2018, the Board authorized the General Manager to enter into a contract with Panorama to provide environmental review services (R-18-20, Minutes).

On February 13, 2019, District staff presented an informational update on the Program to the Board to address the Fiscal Year 2019-20 (FY20) approved Strategic Plan Goals and Objectives (R-19-16, Minutes).

On April 24, 2019, the Board authorized the General Manager to amend the contract with SIG (R-19-52, Minutes).

On May 22, 2019, the Board authorized the General Manager to amend the contract with Panorama (R-19-69, Minutes).

On July 10, 2019, the Board approved the redistribution of treatment actions and estimates within the Integrated Pest Management (IPM) Program due to multiple fire agencies requesting that the District increase the number and scale of its fuel management projects as soon as possible. The administrative change temporarily redistributed the acreage assigned to underutilized management actions from other IPM management categories analyzed under the IPM Program Final EIR (R-19-90, Minutes).

On September 24, 2019, District staff presented the Program background and development to the Planning and Natural Resources (PNR) Committee. The PNR Committee recommended several

Resource Management Policy changes and areas for clarification. The PNR Committee subsequently recommended forwarding the changes to the full Board (R-19-127, Minutes).

On October 28, 2019, District staff presented the Vegetation Management Plan (VMP) for ecosystem resiliency and fire management/public safety to the PNR Committee. During this meeting, the PNR Committee confirmed the recommended sites and prioritization matrix of project locations under the VMP. The PNR Committee recommended forwarding the changes to the full Board (R-19-141, Minutes).

On May 13, 2020, District staff held a CEQA Scoping Session for the Proposed Wildland Fire Resiliency Program meeting with the Board. The Board accepted the Program description for environmental review purposes under the California Environmental Quality Act (R-20-42, Minutes).

At the April 8, 2020, special meeting of the Board, staff conducted a public meeting to review and receive feedback on the proposed Program. No formal Board action was taken (R-20-08, Minutes).

At the July 22, 2020, Board meeting, District staff provided a memorandum with an attached Scoping Report for the Program to the Board. No formal Board action was taken (FYI Memorandum, Minutes).

On February 25, 2021, the District held a public hearing to receive public comment on the *Wildland Fire Resiliency Program Draft Program Environmental Impact Report*. No formal Board action was taken (R-21-32, Minutes).

On May 12, 2021, the Board certified the Program Environmental Impact Report and adopted the Wildland Fire Resiliency Program (R-21-58, Minutes).

On September 28, 2022, the Board adopted a Resolution authorizing the General Manager to enter into a grant funding agreement with the State Coastal Conservancy for up to $1,080,000 in funds from their Wildfire Resilience Program (R-22-108, Minutes).

At the October 26, 2022, special meeting of the Board, staff conducted a public meeting to review and receive feedback on the proposed Program modifications. No formal Board action was taken (R-22-117, Minutes).

PUBLIC NOTICE

Public notice was provided as required by the Brown Act. Public notice was also sent via postcard to 741 preserve neighbors and interested parties and via email to the coastal area, natural resource management, and Wildland Fire Resiliency Program interested parties lists. A meeting notification was also shared via the District's December e-newsletter and posted to the Wildland Fire Resiliency Program webpage.

CEQA COMPLIANCE

The environmental impacts of the minor modifications and inclusions to the WFRP were evaluated in an Addendum to the FPEIR for the Program (Board Resolution No. 21-14). As

described in Attachment 3: Addendum to the FPEIR, no new or substantially more severe significant impacts would occur as a result of the refined PFP component of the WFRP. The mitigation measures and determination of significance for impacts included in the adopted WFRP FPEIR continue to be valid. None of the conditions described in CEQA Guidelines Section 15162 requiring the preparation of a subsequent EIR or CEQA Guidelines Section 15163 requiring preparation of a supplemental EIR have occurred. Therefore, an Addendum to the adopted WFRP FPEIR is the appropriate level of environmental review for the project revisions, as identified in CEQA Guidelines Section 15164.

NEXT STEPS

Pending Board adoption, the District will file a Notice of Determination with the Santa Clara, San Mateo, and Santa Cruz County Clerk Recorder's Offices, which initiates the 30-day public notification period. Staff will also file a Notice of Determination with the State Clearinghouse within five days of Board action. A copy of the FPEIR Addendum would be available for public review at the District's Administrative Office, and a copy would be posted to the District's website. In addition, staff would implement minor technical modifications to the Project. Natural Resource staff would continue to analyze new research regarding wildland fire as it becomes available; staff would return to the Board to refine the Program, including the PFP, as needed.

Attachments

1. Resolution adopting Addendum to the 2021 FEIR
2. Prescribed Fire Plan Description
3. Addendum to the FPEIR

Responsible Department Heads:
Kirk Lenington, Natural Resources
Jane Mark, Planning

Prepared by:
Coty Sifuentes-Winter, Senior Resource Management Specialist, Natural Resources
Jared Hart, Senior Planner, Planning

RESOLUTION NO. 22-__

RESOLUTION OF THE BOARD OF DIRECTORS OF THE MIDPENINSULA REGIONAL OPEN SPACE DISTRICT APPROVING AN ADDENDUM TO THE CERTIFIED FINAL ENVIRONMENTAL IMPACT REPORT FOR THE WILDLAND FIRE RESILIENCY PROGRAM

WHEREAS, pursuant to the California Environmental Quality Act (Public Resources Code § 21000 *et seq.*) ("CEQA"), the Midpeninsula Regional Open Space District (the "District") is the lead agency for environmental review of the Wildland Fire Resiliency Program (the "Program"); and

WHEREAS, on May 12, 2021, the Board of Directors of the District (the "Board") certified the Final Environmental Impact Report ("EIR" or "2021 EIR") for the Program by approving Resolution No. 21-14, which certification was supported by findings of fact, adoption of a statement of overriding considerations and approval of a Mitigation Monitoring Plan ("MMP"); and

WHEREAS, the Program certified in the 2021 EIR analyzed a Prescribed Fire Plan ("PFP") that programmatically addressed the methods and implementation of prescribed fire to manage fuel and improve ecosystem health; and

WHEREAS, subsequent to the certification of the 2021 EIR, the District has developed the details and further refined elements of the PFP, which resulted in certain minor modifications to the Program (the "Modifications"); and

WHEREAS, the Modifications are desirable because they: 1) provide a more detailed framework for the District to use for prioritization and implementation of prescribed fire; and 2) will enhance the District's ability to fulfill the Program goals, which are to preserve and restore biodiversity, enhance habitat, integrate Native American traditional ecological knowledge, and minimize potential effects should a wildland fire occur on the environment, while also reducing fuel loads and wildland fire risks; and

WHEREAS, the District has prepared an Addendum to the 2021 EIR in accordance with CEQA section 21166 and CEQA Guidelines section 15164 to describe the Modifications, attached hereto as Exhibit A (the "Addendum"); and

WHEREAS, the Modifications constitute minor technical changes and would not alter any of the conclusions in the 2021 EIR, or result in new significant impacts to the environment, there is no substantial increase in the severity of previously identified significant impacts, and no new mitigation measures are required.

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NOW, THEREFORE, BE IT RESOLVED AND APPROVED by the Board of Directors as follows:

1. The Addendum to the 2021 EIR fully describes the proposed minor changes to the Program and has been prepared in compliance with CEQA (Cal. Public Resources Code section 21000 et seq.) and the CEQA Guidelines (Cal. Code of Regs. section 15000 et seq.).
2. The Addendum reflects the Board of Directors' independent judgment and analysis.
3. In accordance with CEQA Guidelines section 15164, the Addendum, considered together with the 2021 EIR, statement of overriding considerations and the MMP, adequately addresses the potential environmental impacts associated with the Modifications.
4. The documents and other materials constituting the administrative record of the proceedings upon which the Board's decision is based are located at the Midpeninsula Regional Open Space District, Administrative Office, 5050 El Camino Real, Los Altos, CA 94022.
5. The Addendum is hereby approved by the Board and shall be considered a part of the District's environmental review of the Program.

* *

PASSED AND ADOPTED by the Board of Directors of the Midpeninsula Regional Open Space District on December __, 2022, at a Regular Meeting thereof, by the following vote:

AYES:
NOES:
ABSTAIN:
ABSENT:

ATTEST:

Karen Holman, Secretary
Board of Directors

APPROVED:

Zoe Kersteen-Tucker, President
Board of Directors

APPROVED AS TO FORM:

Hilary Stevenson, General Counsel

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I, the Acting District Clerk of the Midpeninsula Regional Open Space District, hereby certify that the above is a true and correct copy of a resolution duly adopted by the Board of Directors of the Midpeninsula Regional Open Space District by the above vote at a meeting thereof duly held and called on the above day.

_____

Maria Soria, Acting District Clerk

Exhibit A: Addendum to the Final 2021 EIR

ATTACHMENT 2

Midpeninsula Regional Open Space District
Prescribed Fire Plan

November 2022

PROMETHEUS®
Fire Consulting Services LLC

PANORAMA
ENVIRONMENTAL, INC.

Midpeninsula Regional Open Space District
Prescribed Fire Plan

November 2022

Prepared for:

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ENVIRONMENTAL, INC.

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1 Introduction

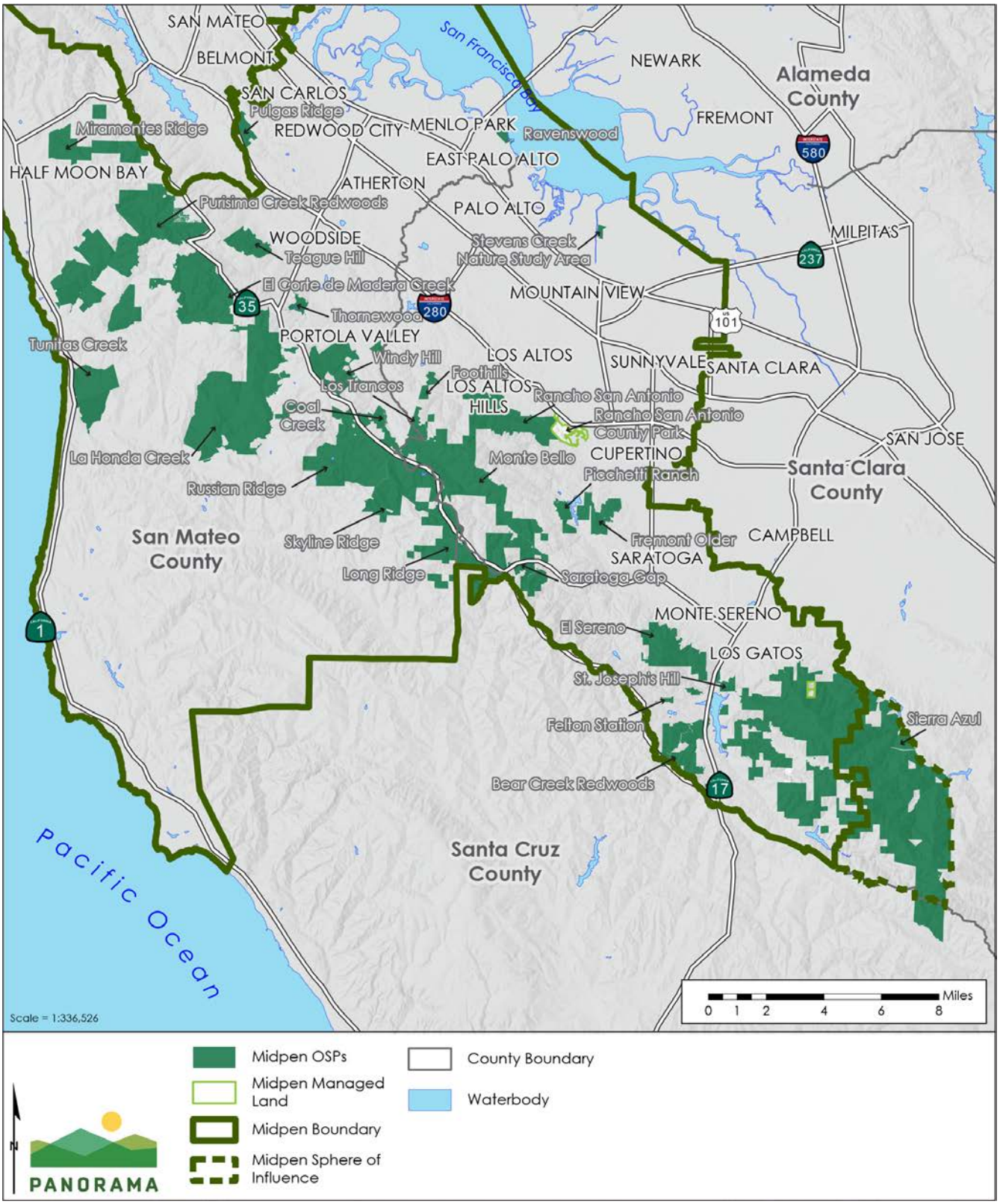
1.1 Wildland Fire Resiliency Program

The Midpeninsula Regional Open Space District (Midpen) is a public agency formed by voter initiative in 1972. Midpen's purpose is to acquire and permanently protect a regional greenbelt of open space lands, preserve and restore wildlife habitat, watersheds, viewsheds, and fragile ecosystems, and provide opportunities for low-intensity recreation and environmental education. Midpen's lands are located within the Santa Cruz Mountain Region and include the San Francisco Peninsula between the Pacific Ocean and the San Francisco Bay (Figure 1-1). Midpen's boundary extends from San Carlos in San Mateo County in the north to the unincorporated Santa Clara County area located south of Los Gatos in the south. Midpen prepared and adopted the Wildland Fire Resiliency Program (Program) in May 2021, which addresses wildland fire management across all Midpen- owned and managed lands (Midpen, 2021).

The Program was comprised of four primary plans:

- **Vegetation Management Plan (VMP):** On a project-level, addresses creation and maintenance of fuelbreaks, fuel management zones, and defensible space zones using vegetation management techniques addressed in Midpen's Integrated Pest Management Program (IPMP);
- **Prescribed Fire Plan (PFP):** Programmatically addresses the methods and implementation of prescribed fire to manage fuel and improve ecosystem health;
- **Wildland Fire Pre-Plan/Resource Advisor Maps:** Describes the creation of Resource Advisor maps for each open space preserve (OSP) and other managed land (or groups of managed lands) that will include information on existing conditions, infrastructure, and resources constraints that can aid fire suppression activities and locate sensitive resource areas that merit protection from potential damage due to fire or fire suppression activities; and
- **Monitoring Plan:** Provides a framework for recording pre-project conditions, vegetation treatment response, and fuels inventories to inform future adaptive management techniques.

Figure 1-1 Midpen Lands



1.2 Overview of Prescribed Burning

Prescribed fire (also referred to as prescribed burning) is a powerful land management tool that can be used to:

- Return fire to the landscape, simulating prior natural processes;
- Reduce unnaturally high accumulations of vegetation;
- Decrease the potential impact and severity of unwanted wildland fires in the future;
- Lessen the potential loss of life and property;
- Control undesirable plant species, plant diseases, and pest insects;
- Create and enhance wildlife habitat and increase availability of forage;
- Promote the growth of fire-adapted or fire-dependent native trees, wildflowers, and other plants;
- Facilitate plant and tree regeneration; and
- Recycle plant nutrients back to the soil.

Prescribed fire activities are implemented in accordance with a pre-written plan (Burn Plan) that identifies land management goals and burn objectives, with prior approval by the applicable regulatory agencies. Burn Plans address characteristics of the land being treated (like topography and vegetation type) and include carefully defined and required parameters to initiate a prescribed fire such as temperature, humidity, wind, moisture of the vegetation, and conditions for the dispersal of smoke. Burn Plans also specify how fire will be applied, by whom, and what fire control people and equipment must be on-scene before the burn can commence. After the Burn Plan is complete and conditions are optimal, a prescribed burn can proceed under the supervision of a qualified Burn Boss. Fire is applied to selectively burn fuels like dead wood, brush, forest understories, and grassland.

The smoke from a prescribed fire can be a nuisance, but when prescribed fire is planned and executed by fire professionals in conjunction with air quality professionals, smoke impacts can be greatly reduced. Prescribed fire is an important wildland fuel treatment method. It is often compatible with environmental goals and is a cost-effective alternative to more labor intensive and time-consuming methods like mechanical or hand-clearing of vegetation (City of Austin and Travis County, 2014).

1.3 Purpose and Need

The PFP included in the Program provided a high-level framework for prescribed fire on Midpen lands. This refined PFP expands upon the programmatic PFP and provides a more detailed framework for Midpen to use for implementation of prescribed fire. The PFP integrates with the VMP and other ongoing Midpen treatment activities on Midpen owned and managed lands.

The purpose of this PFP is to define the activities that Midpen will implement to reinstate prescribed fire practices on its lands to preserve and restore biodiversity, enhance habitat, and

minimize potential effects should a wildland fire occur on the environment, while also reducing fuel loads and wildland fire risks. This PFP identifies the following:

- Historic regional vegetation and general fire regimes;
- History of prescribed burning on OSPs;
- Considerations for prioritization for prescribed fire projects;
- Planning process for undertaking prescribed fire projects;
- Methods for creating, implementing, and maintaining prescribed fire projects and areas treated with fire; and
- Potential best management and environmental protection measures to consider when preparing a Burn Plan for prescribed fire projects.

This PFP focuses on prescribed fire to restore natural ecological processes in OSPs and to reduce fuel loads. Another component of the PFP will be the use of traditional ecological knowledge burns in coordination with Native American Tribes.

The primary need for the PFP is to reintroduce fire as an ecological process that can reduce potential wildland fire risk, thus enhancing public safety, and restore ecological function and resiliency, particularly for fire adapted species. Secondarily, the PFP is needed to reduce live and dead fuels, particularly in areas where mechanical treatments are not feasible or effective due to access and vegetation types.

2 Fire History and Prescribed Fire

2.1 Historic and Current Vegetation Management and Fire History

Periodic fires historically were a part of natural ecological processes on Midpen lands; as a result, many species evolved with fire adaptations and need periodic fire for renewal. Fire opens forests to new generations of younger trees, preserves open grasslands by reducing the spread of encroaching shrubs and/or trees, and stimulates seed germination and shoot growth in chaparral. Without periodic fire, fire-adapted communities are eventually lost, resulting in a reduction of biodiversity and habitat complexity. Fuel in unburned areas can build up to such a high level that when a wildland fire occurs, it can have devastating effects.

Many Native American tribes used fire to shape the natural environment and to clear underbrush and create meadow areas attractive to deer and other animals. Open meadows improved visibility for hunting and encouraged the growth of acorn oaks and other edible plants. Subsequent implementation of fire suppression policies eliminated these benefits, reversing their positive environmental effects.

Impacts of fire suppression continue to reduce biodiversity in Midpen lands. Grasslands and oak woodlands are decreasing in extent due to invading brush and forest species. Stands of coastal scrub and chaparral have aged and are not being renewed. Dense tangles of brush and young trees have largely replaced the park-like understory beneath redwood and Douglas fir forests and mature oak woodlands described by early European explorers.

Changing climatic conditions, past land uses, and years of fire suppression have increased fuel loads and fire-prone conditions that could contribute to larger more intense wildland fires. Prescribed fire helps to restore ecosystems closer to pre-fire suppression conditions through the removal of dead and accumulated vegetation and treatment of forest disease and invasive species. Prior to the mid to late 20th century, landscapes in the San Francisco Bay Area were either managed through natural fire or through Native American practices of prescribed burning that kept fuel loads down. Prior to European contact, the spread of invasive species that alter ecosystems and increases fire risks was also much less of a concern.

More details on the historical and current vegetation management and fire history are described in the VMP, Section 4.2.1 of the Program. Today, in the absence of fire for decades, both live and dead fuels have accumulated, creating higher surface fuel loads, vegetation density, and different species composition from what was seen before European contact.

2.2 Use and Benefits of Prescribed Fire

Prescribed burns are carefully planned with consideration for various factors, including those that affect fire behavior, specifically weather, topography, vegetation types, and historic fire regimes, as well as natural and anthropogenic resources. A critical difference between wildland fire and prescribed fire is that wildland fire behavior is driven by environmental conditions that favor high-intensity, rapid, and uncontrollable fire spread. Contrastingly, prescribed fire is ignited under conditions that favor lower-intensity, slower, and more controllable fire spread. This fact correlates directly to why impacts on resources and communities are generally less for prescribed fire compared to a similarly sized wildland fire.

Prescribed burns are implemented under conditions that ensure the fire burns at low severity, leaving trees and large shrubs alive but burning the surface fuels (e.g., litter, duff, low vegetation), which limits air quality and smoke issues for neighboring communities as well as ensures firefighters can maintain control. In general, two to four times more fuel is consumed during a wildland fire compared to a prescribed fire (Ottmar, 2013). During a wildland fire, fuels are generally drier, tree crowns are typically ignited, much or all of the fuel load present in an area (including live vegetation) may be consumed, and ignition generally occurs during very windy periods. Prescribed burns, however, are typically lower intensity fires that burn less of the fuel load available, typically dead, and low-lying vegetation. Regular, low-intensity prescribed burns can reduce fuel loads that could otherwise contribute to the intensity and spread of a wildland fire (CNRA, 2018).

Many studies have been conducted on the efficacy of prescribed burns to reduce the risks associated with and that alter the behavior of subsequent wildland fire. Studies point to a short-lived effect of prescribed burning on rate of wildland fire spread generally disappearing as soon as the fuel complex regains its pre-burn structure (generally within 2 to 5 years in grassland or shrub ecosystems after prescribed fire). The overall benefits of prescribed burning in forest and woodland ecosystems, namely in avoiding crown fire or substantially reducing the potential for its occurrence, should persist for longer periods since the understory vegetation layer revegetates at a lower rate. Studies have found evidence that wildland fires were stopped or slowed by previous prescribed fires, improved fire control operations due to the existence of fuel-reduced areas and reduced fireline intensity, effective protection of assets, and less overall demand for firefighting resources extended through 5 years after prescribed fire treatments. Fuel reduction burning in the last 10 years can still influence fire behavior and assist in fire suppression, even if the most observable benefits, including wildland fire propagation and fire suppression, were studied to occur within 2 to 5 years after the treatment (Fernandes & Botelho, 2003).

Wildland fires result in greater carbon loss per acre, higher particulate matter emissions rates, and burn an order of magnitude more land than prescribed burning (CARB, 2017; Liu, et al., 2017). One study found that implementation of prescribed burning in forest classes that historically had relatively frequent fire intervals and were determined to be amendable for burning was modeled to reduce GHG emissions by 18 to 25 percent in statewide emissions in

the western U.S. compared to wildland fires (Wiedinmyer & Hurteau, 2010). Emissions modeling conducted for mixed conifer forests found that the ignition of a wildland fire in an untreated area resulted in higher mean emissions for all air pollutants compared to a prescribed fire conducted or a wildland fire ignited in an area after mechanical fuel treatment (Hyde & Strand, 2019). Although emissions from all the mechanical pre-treatment plus prescribed burn emissions with a post-treatment wildland fire were found to equal the emissions from a pre-treatment wildland fire (Hyde & Strand, 2019). Notably, these emissions are staggered, and due to the ability to plan the prescribed fire during optimal weather conditions, air quality-sensitive (human) communities will not necessarily experience the same level of smoke and air quality effects compared to a wildland fire in an untreated area.

Vegetation communities and special-status species respond differently to fire, with some communities and species benefitting and others experiencing adverse effects or mortality. Even for species and communities that benefit, such as chaparral and coastal scrub communities (Keeley, 2008) or San Mateo woolly sunflower (*Eriophyllum latilobum*), extreme wildland fire behavior and temperatures could damage the seedbank or cause mortality. Prescribed burning can be planned for and conducted during the optimal time of year and in suitable locations to benefit species and communities that may benefit from burning (refer to Figure 2-1 for a photo of wildflowers growing after a prescribed burn).

Figure 2-1 Example of Vegetation After Prescribed Burning

Vegetation regrowth at Russian Ridge OSP in spring 2008 after a prescribed burn.

The passage of a fire may directly or indirectly impact cultural resources. Direct or first order impacts include the effects of heat; the deposition of combustion products (e.g., tars, soot and ash); and the exposure of cultural resources to discovery. Indirect or second order effects include the destruction or redistribution of artifacts due to accelerated erosion of the burned site. In addition to prescribed burning occurring during lower temperature days, the lower fireline intensity associated with a surface fire, such as during a prescribed fire, compared to a catastrophic fire, which extends into tree crowns, will reduce vegetation mortality and damage

to cultural resources, if present. If a wildland fire ignites following prescribed fire treatment, the fire may be easier to contain and suppress. The fireline intensity may be reduced, as discussed under wildland fire risk, which will minimize effects on biological as well as cultural resources present.

2.3 Prescribed Fire on Midpen Lands

Between the 1990s and 2009, Midpen utilized prescribed fire as a vegetation management tool, primarily in grasslands. Prescribed burns were conducted for training and ecological purposes at Sierra Azul and Russian Ridge OSPs. These prescribed fires occurred primarily in annual grasslands with relatively well-developed road access and boundaries. Midpen has not conducted a prescribed burn within the last 10 years.

3 Prescribed Fire Planning

3.1 Overview

This section describes the planning process for prescribed burns, including the different objectives, how a burn unit is identified, how Midpen prioritizes burns, considerations in the development of the Burn Plan and Smoke Management Plan (SMP) (refer to Section 3.6), and Midpen's public outreach and notification procedures.

3.2 Prescribed Fire Types and Objectives

3.2.1 Overview

All types of prescribed burns involve the use of fire at varying times of the year, ignition patterns, weather conditions, and fuel moistures. While there will be an overlap between these types of burns, the general burn types and overall objectives for each type are described below. A prescribed burn typically meets more than one objective.

3.2.2 Ecosystem Restoration Burns

Generally, all prescribed burns will provide ecosystem restoration benefits. Specifically, burns conducted for ecosystem restoration are utilized to improve regeneration, resilience, or restoration of fire-dependent plant species and ecotypes that have not experienced a fire in recent times. In cases where small areas may not passively revegetate, these sites may be seeded with native species under the advice of a Midpen Resource Advisor.

3.2.3 Fuel Reduction Burns

These burns are primarily implemented to reduce dead surface and fine fuels such as litter, duff, branches, and logs. This material is consumed in a prescribed fire, to reduce potential wildland fire behavior and severity, in the event of an unplanned ignition in the same area.

3.2.4 Traditional Ecological Knowledge Burns

Traditional ecological knowledge resource burns may be conducted to protect, restore, or facilitate improved production or collection of specific plants, trees, or seeds. The use of prescribed burning for cultural resources should be planned and implemented in collaboration with local Tribal Representatives.

3.2.5 Training Burns

Prescribed burns may be used for training by Midpen employees and cooperating agencies. Training burns can be conducted without ignitions (i.e., "mock burns"), allowing personnel to coordinate under a unified command, test communications, equipment interoperability, and contingency response before conducting live burn activities. Live burn activities train personnel on wildland fire suppression tactics. Training burns are conducted under the direction of the Burn Boss with the primary objective of providing training opportunities or integrated into burns that also meet ecological, cultural, or fuels reduction goals.

3.2.6 Prioritization of Multiple Unplanned Ignitions

In the case of multiple ignitions, Midpen may need to work with an incident management team to provide recommendations that could be used to prioritize fire suppression activities on Midpen lands. Ultimately, the tactics used to suppress wildfire are at the discretion of the Incident Commander (IC). If requested by the IC, Midpen is prepared to help designate natural areas where a resource could benefit from fire, suppression efforts may be aided by allowing the wildland fire to burn through these areas allowing firefighters to make tactical decisions such as lighting backfires or choosing a better location for a control line. Limited equipment, aircraft, and crews can be deployed to stop a wildland fire at the best locations to protect public safety rather than trying to protect natural areas that will benefit from a fire. This type of burn will never dictate suppression tactics but only identify areas that may be lower priority from the perspective of Midpen for suppression when resources are limited or when requested by the IC.

3.3 Delineation of Potential Burn Units

3.3.1 Overview

Burn units are discrete units of land that will be treated under a single prescribed Burn Plan. Prescribed fire burn units will generally consist of continuous vegetation types or multiple vegetation types that can be burned simultaneously (e.g., grassland under live oak forest). Units are sized to allow a prescribed fire to be implemented in one operational period (typically defined as an 8- to 12-hour shift of active fire, with follow up patrol and mop up as needed). Unit boundaries will tend to follow existing infrastructure (roads, trails, and disclines) where feasible and will generally be dominated by one vegetation type (e.g., grasslands, shrublands, oak woodlands). In some cases, multiple vegetation types may be burned within the same unit where control line construction, topography, vegetation boundaries, and access constrain burning a single vegetation type.

3.3.2 Methods

Midpen lands have been delineated into potential burn areas based on topography, similar vegetation types, and existing infrastructure to the extent available. Refer to Appendices A and B for maps of the delineated potential burn areas in relation to vegetation departure from historical conditions and historical fire regimes (USDA, 2022). The historical fire regime data

describes the historical fire return interval (number of years between fires) and fire severity (amount of vegetation killed) expected under a pre-European contact fire regime. The vegetation departure describes the relative difference in current vegetation from what historically could have been expected to be present before European contact.

Due to extreme slopes, certain vegetation types, or sensitive resources, not all potential burn areas will be further delineated into burn units for a prescribed burn. Burn units will be identified within the potential burn areas using a combination of local fieldwork, resource and fire management expertise, geospatial analysis, and information from current and/or future local, county, or regional fuels management strategies. Once a burn unit is identified and determined to be a high priority (refer to Sections 3.4 and 3.5 for how this is determined), a Burn Plan will be prepared to describe the prescribed burn procedures to be used for that burn unit (refer to Section 3.6.2 for a description).

3.4 Requirements for Identification of Suitable Burn Units

Before initiating planning for a prescribed burn under the PFP, a critical path item for Midpen is to determine if a Midpen Resource Advisor (also referred to as READ), who has expertise and experience on Midpen resource management goals, policies, and programs, is available to assist in the planning, implementation, and post-prescribed burn activities. The Midpen Resource Advisor(s) will determine which areas on Midpen lands are suitable for prescribed burning in any year by reviewing the following checklist. This checklist was developed to identify which burn unit(s) meet the minimum criteria for burning.

Table 3-1 Requirement Checklist

Requirement	Requirement Met
Step 1, Midpen determines if:	
A Midpen Resource Advisor is available to assist in the planning, implementation, and post-prescribed burn activities.	☐
Step 2, the Midpen Resource Advisor determines whether:	
Relevant partners (e.g., fire agencies, tribes) are supportive and, as appropriate, able to provide resources for the burn unit(s).	☐
The burn unit(s) are covered by an existing Biological Opinion, if needed, based on species present.	☐
Potential adverse effects from fire on sensitive resources in the burn unit(s) can be avoided or minimized.	☐
Adequate resources are available and can be dedicated to conduct post-fire monitoring and response (e.g., erosion control, invasive species).	☐

Requirement	Requirement Met
The burn unit(s)' generally have a moderate or high departure from its historical seral stages, vegetation patterns, and fire regimes (refer to refer to Appendix A for modeled departure) for burns with the primary objective of ecological restoration, fuel reduction, or traditional ecological knowledge.	☐

3.5 Considerations for Prioritization of Burn Units

The prioritization criteria specified by the READ and fire professionals for prescribed burns will be defined in the future as part of each individual Burn Plan, but may include condition of area or burn unit in terms of forest health, presence of invasive species, and extent of fuel loads; location and ability to manage the burn; and type of vegetation with consideration for improvement of ecosystem function through prescribed burning. Initial burns may focus on re-establishing prescribed fire training areas. These areas will be used for interagency training on live fire and simulated fires to improve resource coordination between Midpen and its neighboring local, state, and federal fire agencies that may participate in future burns.

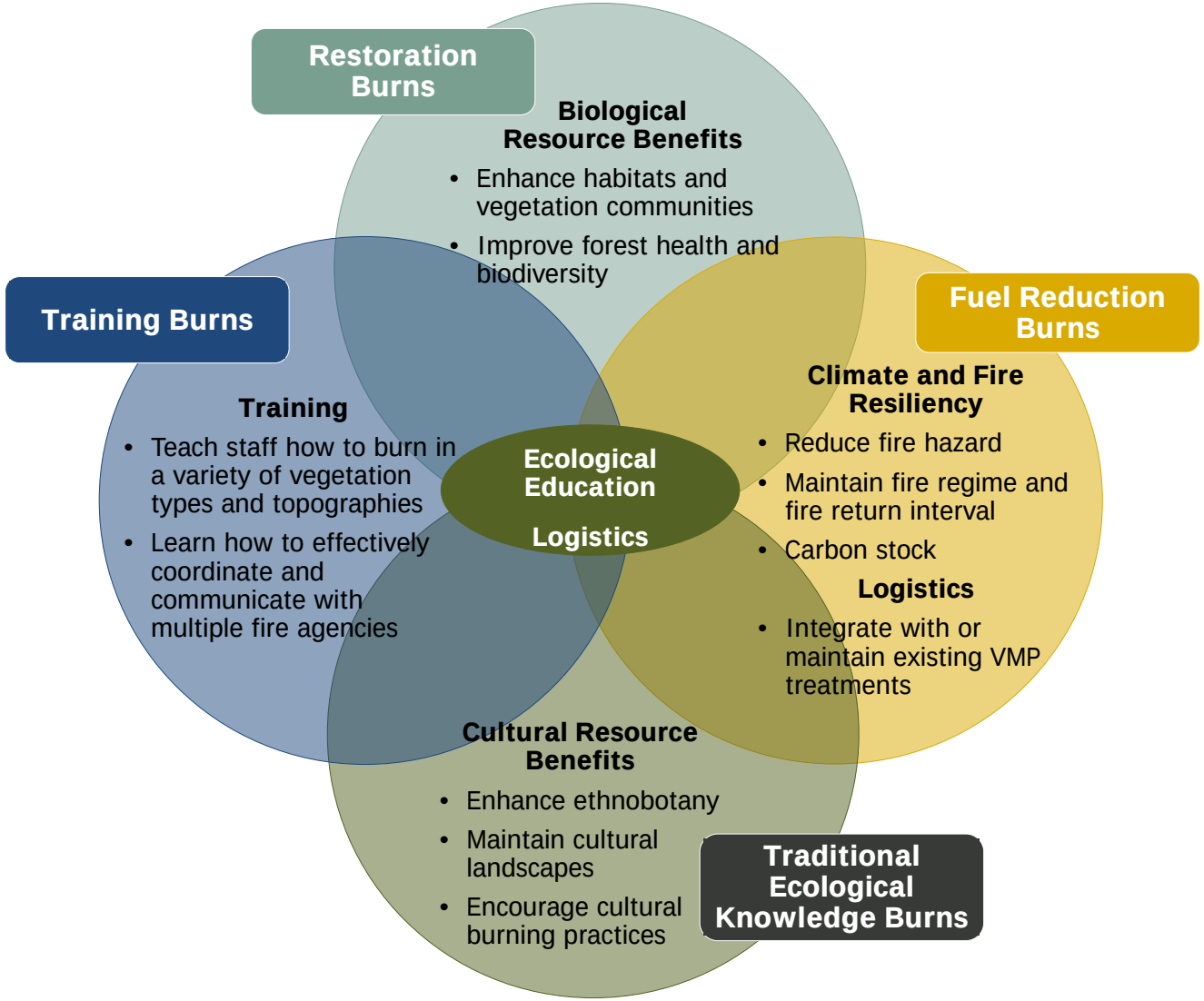
The following considerations for prioritization shown in Table 3-2 will be used by Midpen staff to assist in determining which burn units to undertake in a given year. The criteria considered are not limited to those presented. Burn units will be identified by Midpen staff as important areas based on the primary burn objective. Certain prioritization criteria are associated more closely with a particular primary burn objective. As such, when Midpen identifies a primary burn objective, some associated prioritization criteria shown in Figure 3-1 are likely to be a higher priority than other criteria.

Table 3-2 Potential Burn Unit Prioritization Criteria

	Criteria
Biological Resource Benefits	• Maintain wildlife connectivity • Enhance habitats and vegetation communities • Create a mosaic of habitats • Prevent vegetation type conversion and succession • Encourage nutrient cycling • Manage pests and forest pathogens • Increase vegetation, wetland, and forage productivity • Improve forest health and biodiversity
Cultural Resource Benefits	• Enhance ethnobotany • Maintain cultural landscape • Encourage cultural burning practices

Criteria	
Climate and Fire Resiliency	• Reduce fire hazard and severity • Maintain appropriate fire regime and fire return interval (refer to Appendix B for historic fire regimes) • Address current vegetation departure from modeled historical vegetation class • Stabilize and retain carbon stock • Improve forest resilience to drought, forest pathogens, and insects
Ecological Education	• Educate the public on the benefits of burning • Increase public knowledge and comfort associated with fire in the landscape
Training	• Teach staff how to burn in a variety of: - Vegetation types - Topographies • Learn how to coordinate and communicate with multiple fire agencies effectively • Provide fire suppression experience with live fire for Midpen and fire agency(ies) staff
Logistics	• Ease and safety of a burn with consideration for: - Access - Size - Existing staging areas and control lines - Presence of infrastructure and adjacent uses - Previous treatments - Vegetation types - Fuel loads - Weather - Time of year, particularly in relation to pre-fire suppression fire season - Opportunities for effective smoke management • Appropriate staffing availability • Adequacy of spatial data and maps • Need for new control lines • Improve connectivity of cross-jurisdiction treatments • Integrate with or maintain existing treatment areas under the VMP or other Midpen programs • Ability to: - Retain wildlife refugia - Maintain adequate buffers around protected areas/resources
Note: Criteria presented are not in a specific hierarchy of importance.	

Figure 3-1 Relationship Between Burn Objectives and Potential Prioritization Criteria



3.6 Required Plans

3.6.1 Overview

An approved Burn Plan and SMP, and as appropriate a burn permit, are required before ignition of a prescribed burn. Additionally, the Bay Area Air Quality Management District (BAAQMD), Monterey Bay Air Resource District (MBARD), or other approving entity must be notified of the proposed prescribed burn with appropriate documentation submitted (e.g., Prescribed Burning Smoke Management Plan (Form Rx-1) form, Smoke Management Permit).

3.6.2 Burn Plan Preparation

Burn Plans typically specify the burn unit-level approach that is within the responsibility of the Burn Boss to know and implement. A Burn Plan generally outlines burn unit level information as follows:

- how a burn will be conducted
- resource needs
- burn prescriptions
- potential resources of concern (e.g., communities, biological)
- burn-specific measures
- public outreach and notification
- weather parameters for burning
- burn team communication protocols
- personnel and equipment needed for implementation/mop up/patrol
- contingency strategies to address unanticipated changes during the burn
- general smoke management controls and considerations
- post-burn monitoring

Burn Plans are prepared using a process and template that is followed by the burn plan preparer. Generally, the process for preparing Burn Plans on federal lands is specified by the National Wildfire Coordination Work Group (NWGC), and the process for preparing plans on private lands in California is overseen by CAL FIRE. Both entities provide a Burn Plan preparation guide and template, which may be updated and distributed as burn planning requirements change. The latest NWGC prescribed fire template is available at this link and the most recent CAL FIRE prescribed fire guidebook, which includes a template, is available at this link (NWCG, 2022; CAL FIRE, 2019).

Burn Plans are prepared by a qualified burn plan preparer, who is either a qualified prescribed fire Burn Boss or competent trainee under the direct supervision of a qualified Burn Boss. The Burn Plan then undergoes technical review by a qualified Burn Boss with local knowledge and experience. The Burn Boss then approves the Burn Plan. Finally, the Burn Plan is provided to the appropriate approving entity prior to the prescribed burn for review, which include entities such as CAL FIRE, local, or county fire departments, and BAAQMD and MBARD.

3.6.3 Burn Planning and Design Requirements and Potential Measures

Prescribed burns are required to adhere to regulations and any Midpen-specific permits and environmental compliance, which will be noted in the Burn Plan. All stipulations relevant to prescribed burning in the latest Native Endangered and Threated Species Recovery Permit (Recovery Permit) for California red-legged frog (CRLF) or San Francisco garter snake (SFGS) issued by the U.S. Fish and Wildlife Service (USFWS) are relevant. Relevant stipulations include but are not limited to required burn windows[1] when conducting a prescribed burn in suitable CRLF and SFGS habitat, reasonable attempts to leave refugia, and notification of USFWS prior to a burn. Midpen certified the Program Environmental Impact Report (PEIR) for the Program, which included the programmatic PFP, in May 2021 (Midpen, 2021). The certified PEIR consists of a variety of mitigation measures and Midpen best management practices relevant to burning that must be adhered to.

Burn Plans may incorporate additional unit-level best management practices (BMPs) as needed to address local resource protection or other concerns at the unit level. These BMPs include specific precautionary actions to minimize the potential for erosion following a burn, reduce smoke during a burn, control the burn, and preserve important ecological layers that exist at and below the ground surface. The following prescribed fire BMPs are examples that could be included in a Burn Plan (USEPA, 2019):

- Develop and implement a smoke management plan in accordance with current relevant local, CAL FIRE, and BAAQMD or MBARD guidelines;
- Develop and implement a firing plan that best meets unit-level resource objectives for vegetative cover;
- Utilize existing roads and trails for firebreaks where safe and feasible;
- Build waterbars and stabilize constructed control lines as needed to reduce direct erosion into streams;
- Limit the use of mechanical equipment for control line construction in riparian areas;
- Protect against excessive erosion or sedimentation to the extent practicable;
- Carefully handle and dispose of oil and fuel for equipment and vehicles. Spills, leaks, empty containers, and filters are potential sources of soil and water contamination if improperly managed;
- Develop and implement a spill contingency plan identifying all actions to be taken in the event of a chemical spill, including phone numbers for federal, state, and local agencies that must be notified; and
- Avoid constructing waterbars in control lines that divert surface runoff directly into streams.

[1] Burn windows are described as the period of time during which a prescribed burn may be scheduled for ignition.

3.6.4 Smoke Management Plan

Smoke management is an important component of the planning process. The California Air Resources Board (CARB) has adopted Smoke Management Guidelines, which will be used to create the SMP. The SMP specifies the "smoke prescription" for a specific burn, which is an assessment of the air quality, meteorological, and fuel conditions of the proposed burn in greater detail and with a broader scope than what is addressed in the Burn Plan. Depending on the size and complexity of the burn, the SMP will contain some or all of the following types of information:

- Burner name and contact information
- Burn method
- Fuel type and moisture levels
- Meteorological parameters (e.g., wind vector, temperature)
- Nearby population centers
- Planned burn time
- Acceptable burn ignition conditions
- Contingency planning for smoke management
- Burn monitoring procedures
- Location and size of the burn
- Expected pollutant emissions
- Smoke travel projections, including maps
- Duration of the burn
- Smoke minimization techniques
- Description of alternatives to burning
- Public notification procedures

A Burn Plan will be drafted and may be reviewed by the appropriate fire agency that has jurisdiction (e.g., CAL FIRE, local fire agency). During certain times of the year, a burn permit will be issued by the relevant fire authority. A permit to burn will always required by BAAQMD or MBARD and may require submittal of an SMP to be approved.

Midpen will organize the resources needed to conduct the burn, notifying the public and adjacent neighbors about the planned timing and specifics of the burn and obtaining final BAAQMD or MBARD authorization to conduct the burn following the prior approved Burn Plan. BAAQMD or MBARD will be notified of the proposed prescribed burn by submitting a smoke management plan via the online program Prescribed Fire Information Reporting System (PFIRS). Midpen will contact BAAQMD or MBARD up to 96 hours prior to the desired burn time to obtain a forecast of the meteorology and air quality needed to conduct the burn safely. Midpen will continue to work with BAAQMD or MBARD, and CARB until the day of the burn to update the forecast information.

BAAQMD or MBARD authorization to conduct a prescribed burn is provided for no more than 24 hours prior to the burn. The individual granted the authority to burn (Burn Boss) is responsible for assuring that all conditions in the approved SMP and burn permit are met

throughout the burn. Once the fire has been ignited, Midpen and participating firefighting agencies must make all reasonable efforts to ensure the burn stays within the approved SMP prescription. If a burn goes out of its prescription or adverse smoke impacts are observed, the Burn Boss will implement smoke mitigation measures as described in the SMP (CARB, 2019). BAAQMD, MBARD, CARB, or other regulatory entities may update these SMP procedures over time.

3.7 Stakeholder, Public Outreach, and Notification

3.7.1 Overview

Ensuring key stakeholders and the public are educated about the burn goals and objectives, location, and timing is a key component of successful burn implementation. Midpen will determine the extent of the public outreach and notification, depending upon the burn scope and location. These outreach and notification guidelines were developed based on successful prescribed burns in the Santa Cruz Mountain region.

3.7.2 Method and Timing of Outreach

Key stakeholder engagement, including outreach to local Town and City staff/elected bodies, will normally start prior to the finalization of a burn plan. During the planning phase, key stakeholders will be provided an opportunity to provide input into the plan within their area of expertise or purview and as appropriate. Inclusion of any input into a burn plan is at the sole discretion of the burn boss, who is the final authority to approve and amend a burn plan, with concurrence from the District.

The notification process to remind and inform the community about scheduled burns starts once the District's Resource Advisor has identified a potential location(s), objective(s), fire agency partner(s), and burn window. The District would implement several notification methods during public outreach and notification for all future burns.

Under the advisement of or in consultation with the local emergency services and fire agencies, the District may conduct expanded notification to the community using local and regional communication tools and methods (e.g., local and regional social media channels, including requesting support from surrounding Cities and Towns to transmit notifications via their communications channels). This may also involve requesting assistance from local partner agencies (e.g., California Department of Transportation for roadside signs, transmitting notifications via local CalFire/emergency response communications channels) to support additional outreach leading up to and including the day of a prescribed fire.

The public is additionally encouraged to sign up for the appropriate interested parties list (e.g., Wildland Fire) to stay informed of upcoming activities, including prescribed burns. The public can visit https://www.openspace.org/opt-in to be added to the appropriate list.

3.7.3 Content of Outreach

Midpen will determine the specific content of the outreach notifications for each burn to tailor the information, as appropriate. The notices that Midpen disseminates will include the following information, at a minimum, in addition to any specifics that Midpen determines relevant or as required per the individual Burn Plan:

- Location (including the preserve and major intersection(s))
- Objective(s) of the burn
- Fire agency partner(s) involved
- Potential burn window
- Current contact number(s) for the burn coordinator

Table 3-3 Notification Checklist

Notification Method	Completed?
Notification for Which Midpen will be Responsible	
Within 3 Months Leading up to the Proposed Burn Window:	
Update Midpen's website with information	☐
Provide notifications to Key Stakeholders	☐
Within a Reasonable Period of Time in Advance of the Burn Day (e.g., One Week):	
Install signage at the relevant preserve	☐
Update Midpen's website with information	☐
Notify adjacent neighbors/homeowner's associations	☐
Provide notifications to key stakeholders and the relevant public	☐
At Least Two Days Prior to the Burn Day:	
For a less than 50-acre burn: [a] • Notify individuals and jurisdictions within 1 mile, and • Install notices at trailheads and access roads leading to the burn unit For a 50-acre burn or larger: [a] • Notify a larger region, determined by Midpen	☐
Notification Under the Discretion of Other Agencies/Partners	
Within 3 Months Leading up to the Potential Burn Window:	
Engage with partners who may amplify Midpen's messages to their audiences	☐
Day of the Burn:	
When relevant, install road signs on adjacent major thorough fares[b]	☐
Use relevant county push notification	☐

Notification Method	Completed?

Notes:

[a] Required per Mitigation Measure Air Quality-2 of the PEIR.

[b] Mitigation Measure Hazards-3 of the PEIR has certain stipulations that when met require signage along adjacent roads.

4 Burn Unit Preparation for Prescribed Fire

4.1 Mechanical Pre-Treatment

Burn units may receive limited mechanical pre-treatment to improve or install control lines for operational safety. Treatments may include, but are not limited to mowing, mastication, chipping, falling of snags, and brushing of roads, and could encompass:

- Removal of live limbs of trees up to 10 feet above the ground to minimize the potential for fire to spread to the canopy;
- Scattering and/or mastication of the accumulated dead and decadent woody brush;
- Top-cutting and on-site scattering of green brush (particularly broom) a minimum of 60 days before the burn event to cure, which facilitates horizontal fire spread during the event and reduces smoke production; and
- Installation of control lines (refer below) where natural control lines such as roads, trails, or water bodies are unavailable.

The pre-treatments will generally follow those described in Chapter 4: Vegetation Management Plan of the Program. Limbing, scattering, and masticating dead material and top-cutting of green material may occur many months to days prior to the burn event, depending on the larger project goals and site conditions. The work is accomplished using heavy equipment, power tools, and/or hand tools.

Pile burning may be used to remove the cut or dead vegetative material where chipping, hauling, or decomposition are not feasible. Piles can be constructed of vegetative material, covered (to keep dry) and burned when conditions are wet. Pile burning can impact soils directly underneath the pile due to excessive heating. Depending on the surrounding vegetation and under the advice of a Midpen Resource Advisor, the charred remains may be raked out and the site will be allowed to passively revegetate and/or directly seeded with native Santa Cruz Mountain plants.

Pile burning is a method of biomass disposal that uses fire to eliminate piles of dried plant material. Piles vary in size from 5 to 10 feet in diameter and 4 to 6 feet in height. Piles are constructed in concert with brush or weed removal and are placed in openings away from power lines and tree canopies to allow for safe ignition at a later date. The composition of piles varies with vegetation type, and could consist of chaparral species, broom, as well as hardwoods and conifer limbs. The total volume of material allowed to be pile burned in a year is addressed under the VMP in the overall Program.

Pile burning occurs under the direction of Midpen employees on days when weather and fuel conditions meet the specifications of the BAAQMD and MBARD. Multiple piles may be burned

on a single day. Drip torches are used to start ignitions, with fuel use limited to 10-gallons or less per day. Midpen employees remain on-site with fire suppression equipment, including a water supply (e.g., tender), to ensure safety and to extinguish embers by each workday's end.

4.2 Creation and Maintenance of Control Lines

Where feasible and effective, Midpen will utilize existing control lines (also known as firelines), including paved roads, dirt roads, trails, and disclines. These existing lines may be improved by clearing accumulated vegetation on or near the lines; removing dead trees that may fall on, near, or across lines; blacklining; and widening. Blacklining involves the pre-burning of fuels adjacent to a control line before igniting a prescribed burn. Blacklining is usually done adjacent to a control line during periods of low fire danger prior to the prescribed burn to reduce heat on holding crews and lessen chances for spotting across the control line during the main burn. In fire suppression, a blackline denotes a condition where there is no unburned material between the control lines and the fire edge.

Control line installation occurs within a few weeks or days of the burn event and may be accomplished with heavy equipment or hand tools. A new control line may be installed through mowing, mastication, scraping, or wetting. The method and width of a new control line, if needed, will be determined by Midpen in coordination with the Burn Boss and then detailed in the Burn Plan. New control lines will be constructed to standards described in the Burn Plan but will generally be 1.5 times as wide as the height of the fuel that will carry the fire, depending on location, vegetation type, and type of equipment used to construct the line. The fuel that will carry the fire refers to what will burn during a prescribed burn rather than all fuels present. For example, the fuel in a forest consists of leaf litter and understory vegetation, not the tree canopy. In grasslands, a control line may involve mowing a swath up to 10 feet wide. Control lines in shrub communities may need to be up to 30 feet wide. Forest communities may need a control line up to 10 feet wide.

Hose lays may be used along control lines at the discretion of the Burn Boss or as described in the unit-level Burn Plan. Temporary control lines will be rehabilitated as needed once the Burn Boss declares the prescribed fire out.

5 Prescribed Fire Implementation

5.1 Overview

This section describes how prescribed burns are carried out, including equipment, personnel, burn ignition, mop up, rehabilitation and schedules.

5.2 Equipment and Personnel

The unit-level Burn Plan and Incident Action Plan (IAP) will describe the specific equipment and personnel needed to conduct a burn. The Burn Plan describes the firing, holding, patrol, mop up, and monitoring staff needs and qualifications needed to implement an individual burn based in part on that burns individual complexity rating and IC discretion. A typical IAP contains the incident objectives, the organizational structure, the division-specific assignments, the communication plan, and the medical plan. Depending on the project's complexity, additional elements can be added to the IAP.

While Midpen employees will take the lead on defining the location, objectives, goals, and monitoring of the prescribed fire, CAL FIRE, another local fire agency, and/or contractors will take the lead role in approving, conducting, and supervising all operational activities. Typically, designated Midpen employees are trained to provide a discrete supporting role during prescribed burns, such as suppression or holding staff or Resource Advisors.

Prescribed burns are generally staffed with the personnel and equipment needed to implement and monitor the burn. The staffing level can vary by the burn's complexity rating (e.g., size, fuel types) and burn window weather conditions. For example, a 100-acre burn in timber understory under cool

SELECT PRESCRIBED FIRE STAFF

Agency Administrator - Authorizes the prescribed fire and assigns Burn Boss to execute prescribed fire under predefined conditions.

Burn Boss - Ensures that all prescribed fire plan specifications are met before, during, and after a prescribed fire. Supervises all prescribed fire resources and is responsible for the safe and effective implementation of the prescribed fire.

Firing Boss - Leads ground ignition operations and is responsible for the safety and coordination of assigned resources on prescribed fire and wildfire incidents. Reports to the Burn Boss and coordinates with the Holding Specialist.

Holding Specialist - Supervises all resources that are responsible for ensuring the prescribed fire stays within the burn unit boundaries. Reports to the Burn Boss and coordinates with Firing Boss.

Resource Advisor - Provides professional knowledge and expertise for the protection of natural, cultural, and other resources within an incident environment.

Fire Effects Monitor - Responsible for collecting incident status information and providing this information to the Burn Boss. The information may include fire perimeter location, onsite weather, fire behavior, fuel conditions, smoke, and fire effects information needed to assess firefighter safety and whether the fire is achieving established incident objectives and requirements.

conditions may require 25 firefighting staff, versus the same burn unit under hot conditions may require 60 firefighting staff.

General types of equipment needed during burn implementation will be similar to those already listed for vegetation management activities within Chapter 4: Vegetation Management Plan of the Program and may include fire engines of different sizes (depending on the cooperating agency or contractor equipment), fire hose, hand tools, chainsaws, and approved ignition devices. In some cases, contingency equipment may include a bulldozer, additional fire engines, and additional personnel. Additional aerial equipment may include helicopters of different sizes if needed for implementation or contingency.

5.3 Safety Precautions

The unit-level Burn Plan will describe burn unit safety, including potential hazards and mitigations. These precautions can include, but are not limited to, managing individual firefighter safety through proper command structure, personal protective equipment, training, and hydration. Mitigating risks of potential falling live and dead trees or managing vehicle and human traffic within the proximity of the burn will be considered. In addition, contingency planning for excessive smoke production and a wildfire declaration element are a part of every Burn Plan, which describes how the Burn Boss and staffing resources will regain control of the fire should it move outside of established control lines.

5.4 Prescribed Burn

5.4.1 Prescribed Burn Ignitions and Implementation

The prescribed fire will be ignited in the planned burn units using approved ignition devices, which in most cases will be a drip torch, but may include other equipment such as hand-held flares (“fusee”), hand launched devices, or similar methods or potentially aerial ignitions via a helicopter or unmanned aerial vehicle (UAV) for dangerous or difficult to access locations. Aerial ignitions often use a Plastic Sphere Dispenser, but may include helitorch operations. The Burn Plan will describe the general ignition pattern such as a strip head fire, dot ignition, or other, with discretion given to the Burn Boss to use the pattern they deem most appropriate given local vegetation and weather conditions. The prescribed fire is allowed to burn to the control lines that define the burn unit. Areas that do not burn during a prescribed burn can serve as refugia to give wildlife a place to safely retreat to during burning.

5.4.2 Physical Control During the Burn

The prescribed fire will be controlled using methods and resources described in the unit-level Burn Plan under the direction of the Burn Boss. Control will be accomplished by or with hand crews, fire engines, hose lays, portable pumps, backpack pumps, and hand tools. Aerial support via helicopter or UAV on more complex burns may be utilized as well.

5.4.3 Mop Up

Mop up is the process by which the prescribed fire is safely put out. Mop up is when firefighters extinguish or remove burning material near the control lines. Select snags or trees may need to be taken down because of fire inside their trunk. Logs may need to be trenched to prevent rolling after an area has burned. Putting out any flames or stirring up a hot spot that is smoking is also done. The work starts along the back or cooler sides of an active fire as soon as possible. Depending upon multiple factors (e.g., fire behavior, weather forecast), some crew members may remain on site for extended periods (overnight). Mop up work is generally performed all the way around a fire's edge. Mop up will be conducted using hand crews, equipment, hose lays, or other methods as described in the unit-level Burn Plan.

5.4.4 Rehabilitation

Rehabilitation consists of the decommissioning of control lines as well as follow-up weed control after a prescribed fire. Proposed rehabilitation activities must be approved by the READ, such as the spreading of procured native seed or planting of nursery stock. Control line decommissioning is generally limited to the manual re-distribution of duff and brush back into the previously cleared lines. This spreads native seed back into the lines to facilitate natural revegetation. It also provides erosion control and discourages the formation of social trails. Because some weed seeds are stimulated by fire or become readily established in post-fire settings, Midpen Early Detection Rapid Response (EDRR) crews will patrol prescribed burn sites for 1 to 5 years as needed following a burn event to identify the need for weeding or additional restoration work.

5.5 Schedule and Timing for Prescribed Burn Program Implementation

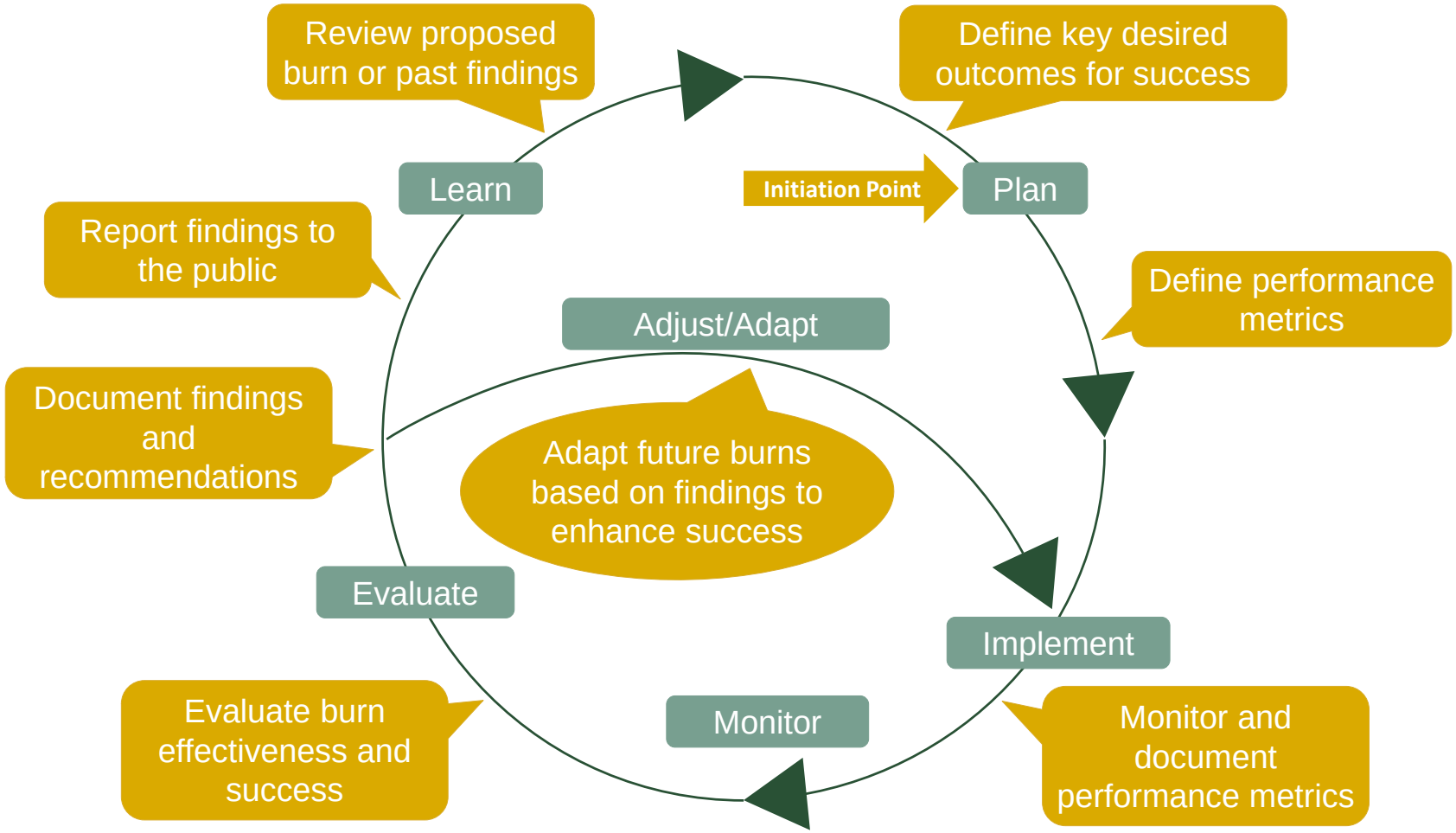
Midpen anticipates conducting one to three prescribed burns annually during the first three to five years of the Program. Individual burns in the first few years are expected to be lower complexity burns of a smaller size. Annual burning during the first several years is expected to average up to 100 acres, but depending upon crew availability and burn conditions could be as much as 500 acres. In the longer term, high complexity and larger individual burns, in terms of size (e.g., up to 100 acres) and duration, may be implemented depending on capacity, local fuel, and weather conditions. After three to five years, Midpen may implement as much as three burns a year or more. Annual acreage burned under this program will not exceed 500 acres per year.

Prescribed burns typically occur from June through November, but other times of year may also be considered. The timing of a prescribed burn depends on a set of conditions that considers the safety of the public, fire staff, and probability of meeting the burn objectives. Environmental conditions considered include but are not limited to, windspeed, fuel moisture levels, air temperature, and relativity humidity. Other considerations could include natural and cultural resource protection requirements and permitting restrictions.

6 Monitoring and Adaptive Management

Midpen has an extensive Monitoring Plan (Chapter 7 of the Program) that describes a range of monitoring methods that can be used to assess vegetation, wildlife, weather, and other natural resources. Prescribed burns may have multiple aspects to monitor prior to, during, and for a specific period after the burn. These parameters can include changes in fuel load, vegetation cover, or the presence of wildlife. Individual burn units will be monitored for resources described in the unit Burn Plan and consistent with the Monitoring Plan detailed in the Program. It should be noted that monitoring methods may evolve from the current Monitoring Plan as new technologies or scientifically acceptable methods become available in the future. Monitoring of prescribed burns may provide opportunities for student and professional research on fire ecology, where appropriate. Information learned from burn unit monitoring can be used to modify or improve management approach for future prescribed burns using the adaptive management framework (refer to Figure 6-1).

Figure 6-1 Monitoring and Adaptive Management Framework



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APPENDIX A VEGETATION DEPARTURE FROM HISTORIC VEGETATION ON MIDPEN LANDS

APPENDIX B HISTORIC FIRE REGIMES ON MIDPEN LANDS POLICY REPORT

ATTACHMENT 3

Midpeninsula Regional Open Space District

Addendum to the Wildland Fire Resiliency Program Environmental Impact Report

State Clearinghouse No. 2020049059

November 2022

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1 Introduction

1.1 Background

The Midpeninsula Regional Open Space District (Midpen) is a public agency formed by voter initiative in 1972. Midpen's purpose is to acquire and permanently protect a regional greenbelt of open space lands; preserve and restore wildlife habitat, watersheds, viewsheds, and fragile ecosystems; provide opportunities for low-intensity recreation and environmental education; and support viable agricultural uses of the land on the San Mateo County coast. Midpen has preserved, to-date, a regional greenbelt system of more than 65,000 acres of public land and manages 26 open space preserves (OSPs) and other land under management agreements (referred to as "Midpen lands" throughout this document).

Wildland fire prevention, preparation, and response are a part of Midpen's land stewardship. California's fire season is now longer and more intense due in part to dense regrowth of historically logged forests, more than a century of fire suppression, increased development in the wildland urban interface (WUI), and a changing climate. To meet these growing challenges, Midpen developed and approved the Wildland Fire Resiliency Program (WRFP) in May 2021 to allow for increased and environmentally sensitive vegetation management. Vegetation management activities can reduce the potential for severe wildland fire. A major wildland fire on unmanaged lands likely will have more substantial ecosystem, recreation, carbon, and resource impacts than the impacts from the work to manage the vegetation.

The WFRP addresses wildland fire management across all Midpen lands (Midpen, 2021). The Program is comprised of four primary plans:

- **Vegetation Management Plan (VMP):** On a project-level, addresses creation and maintenance of fuelbreaks, fuel management zones, and defensible space zones using vegetation management techniques addressed in Midpen's Integrated Pest Management Program (IPMP);
- **Prescribed Fire Plan (PFP):** Programmatically addresses the methods and implementation of prescribed fire to manage fuel and improve ecosystem health;
- **Wildland Fire Pre-Plan/Resource Advisor Maps:** Describes the creation of Resource Advisor maps for each open space preserve (OSP) and other managed land (or groups of managed lands) that includes information on existing conditions, infrastructure, and resources constraints to aid fire suppression activities and to locate sensitive resource areas that merit protection from potential damage due to fire or fire suppression activities; and

- **Monitoring Plan:** Provides a framework for recording pre-project conditions, vegetation treatment response, and fuels inventories to inform future adaptive management techniques and refinement of the WFRP over time.

The PFP provided a high-level framework for prescribed fire on Midpen lands, but since completion of the WFRP, Midpen has further refined the plan based on a closer examination of prescribed fire goals and methods. The refined PFP expands upon the programmatic PFP and provides a more detailed framework for Midpen to use for implementation of prescribed fire. The PFP integrates with the VMP and other ongoing treatment activities on Midpen lands.

1.2 CEQA Compliance

Midpen's Board of Directors certified an Environmental Impact Report (EIR) for the WFRP (State Clearinghouse Number 2020049059) in May 2021 (Midpen, 2021). The WFRP EIR was prepared in accordance with the California Environmental Quality Act (CEQA) to assess the environmental effects of the WFRP, including the programmatic PFP. The mitigation measures (MMs) adopted as part of the WFRP EIR are presented in Appendix A. The Notice of Determination for the WFRP EIR was filed on May 14, 2021.

As previously mentioned, several aspects of the PFP have been refined from what was analyzed in the certified Final EIR. Pursuant to Section 15164 of the CEQA guidelines, an addendum to an adopted EIR shall be prepared if only minor technical changes or additions are necessary and none of the conditions described in Sections 15162 and 15163 of the CEQA Guidelines have occurred that call for preparation of a subsequent or supplemental EIR. As described in Section 15162(a), a subsequent or supplemental EIR would be required if substantial changes occur to the project or substantial changes to the circumstances under which the project is undertaken occur that would involve either (a) a new significant environmental effect or (b) a substantial increase in the severity of a previously identified significant effect.

This Addendum describes the changes and additions to the programmatic PFP (referred to as the "refined PFP"), and identifies the changes to the analysis in accordance with the Appendix G resource questions analyzed in the WFRP EIR. This Addendum finds that the revisions to the PFP would not result in new significant impacts nor would they substantially increase the severity of previously identified significant impacts (CEQA Guidelines Section 15162), concluding that an addendum is the appropriate approach to document the changes since certification of the Final EIR. No new information of substantial importance has been identified, and none of the conditions described in Sections 15162 and 15163 of the CEQA Guidelines that call for preparation of a subsequent CEQA document are present.

Section 15164(c) of the CEQA Guidelines states that "[a]n addendum need not be circulated for public review but can be included in or attached to the final EIR or adopted negative declaration." Because the impact determinations in the Final EIR have not changed, additional circulation and review of public comments are not required.

2 Description of Refined PFP

Table 2-1 presents a comparison of changes between the refined PFP and the approved PFP originally analyzed under the certified WFRP EIR. The refined PFP is incorporated here by reference. The changes or additions made between the approved programmatic PFP and refined PFP are underlined in Table 2-1.

Table 2-1 Comparison of Prescribed Fire Plan Refinements

Component	Approved Programmatic Prescribed Fire Plan	Refined Prescribed Fire Plan
Burn Objectives	• Ecosystem Restoration Burns • Traditional Ecological Knowledge Burns • Training Burns • Prescribed Natural Fire	• Ecosystem Restoration Burns • Fuel Reduction Burns • Traditional Ecological Knowledge Burns • Training Burns • Prioritization of Multiple Unplanned Ignitions (previously referred to as Prescribed Natural Fire)
Annual Number of Burns	First 3 to 5 years • One to two prescribed burns annually After 5 years • Up to three prescribed burns annually	First 3 to 5 years • One to three prescribed burns annually • Anticipated to be lower complexity burns of a smaller size (e.g., 10 to 20 acres) with annual burning averaging potentially up to 100 acres, but depending upon crew availability and burn conditions could burn as much as 500 acres After 3 to 5 years • Up to three prescribed burns or more annually • May be high complexity and larger sized individual burns (e.g., up to 100 acres) over a longer duration, with up to 500 total acres a year
Maximum Annual Burn Area	500 acres	No change
Assumed Vegetation Types of Annual Burns – San Francisco Bay Area Air Basin (SFBAAB)	*Single Scenario Modeled for Air Quality Impacts: 450 acres*[b] • 10 percent grassland communities • 60 percent woodland communities	*Multiple Scenarios Modeled for Air Quality Impacts: 500 acres*[b] SFBAAB Scenario 1 • 10 percent grassland communities • 60 percent woodland communities • 30 percent shrub communities

Component	Approved Programmatic Prescribed Fire Plan	Refined Prescribed Fire Plan
	• 30 percent shrub communities	SFBAAB Scenario 2 • 60 percent grassland communities • 30 percent woodland communities • 10 percent shrub communities SFBAAB Scenario 3 • 45 percent grassland communities • 25 percent woodland communities • 10 percent shrub communities • 20 percent mixed conifer/hardwood communities
Assumed Vegetation Types of Single Day Burn – North Central Coast Air Basin	*Single Scenario Modeled for Air Quality Impacts: 50 acres* • 100 percent grassland communities	No change
Pre-Treatment Activities	• Mechanical pre-treatment using heavy equipment, power tools, and hand tools to improve control lines or operational safety • Pile burning may be used for biomass disposal • Pre-treatment to improve existing control lines and for operational safety is quantitatively addressed under the VMP • The total volume of material allowed to be pile burned in a year is quantitatively addressed under the VMP • Pre-treatment to install new control lines was not explicitly addressed due to lack of specifics	• Mechanical pre-treatment using heavy equipment, power tools, and hand tools to improve control lines or operational safety • Pile burning may be used for biomass disposal • Pre-treatment to improve existing control lines and for operational safety is quantitatively addressed under the VMP • The total volume of material allowed to be pile burned in a year is quantitatively addressed under the VMP • Pre-treatment to install new control lines is estimated based on delineated potential burn areas and more specific control line parameters
Existing Control Lines	Paved roads, dirt roads, trails, and disclines	No change
New Control Lines - Types	Not specified in the PFP. The WFRP EIR assumed that a new control line may be installed through discing.	A new control line may be installed through mowing, mastication, scraping, or wetting of fuels.
New Control Lines - Width	New control lines would be constructed to standards described in the Burn Plan, but	New control lines will be constructed to standards described in the Burn Plan, but will generally be 1.5 times as wide the height of

Component	Approved Programmatic Prescribed Fire Plan	Refined Prescribed Fire Plan
	typically would be 1-foot to 6-foot wide, depending on location, vegetation type, and type of equipment used to construct the line.	the fuel which will carry the fire, depending on location, vegetation type, and type of equipment used to construct the line. In grasslands a control line may involve mowing a swath up to 5 to 10 feet wide. Control lines in shrub communities may need to be 20 to 30 feet wide. Forest communities may need a control line of 5 to 10 feet wide.
New Control Lines - Linear Feet	Not quantified in the PFP.	8,000 linear feet of new control lines annually [a,b]
Identification of Burn Units	Not identified in the PFP.	• Potential burn areas are delineated and shown in maps based on topography, similar vegetation types, and existing infrastructure. • Burn units will be identified within the potential burn areas, although not all potential burn areas will be further delineated into burn units. • Specific requirements must be met prior to initiating planning for a burn and for burn unit(s) to be suitable for burning. • If the requirements are met, Midpen will review the burn units with consideration for prioritization criteria to determine which burn units to undertake in a given year.
Public Notification Process	Not specified in the PFP. • Individual approved Burn Plans and Smoke Management Plans will identify certain outreach requirements. • Mitigation Measure (MM) Air Quality-2 of the WFRP EIR requires notification at least two days prior to a burn day to relevant individuals and jurisdictions, depending upon size of the burn. • MM Hazards-3 of the WFRP EIR requires installation of temporary signage on public roads, if not closed, at intervals ahead of and	• Individual approved Burn Plans and Smoke Management Plans will identify certain outreach requirements. • MM Air Quality-2 of the WFRP EIR requires notification at least two days prior to a burn day to relevant individuals and jurisdictions, depending upon size of the burn. • MM Hazards-3 of the WFRP EIR requires installation of temporary signage on public roads, if not closed, at intervals ahead of and adjacent to a prescribed burn. • Stakeholder, public outreach, and notification guidelines were developed and incorporated into the PFP identifying what notification Midpen will be responsible for as well as notification under the discretion of other agencies and partners.

Component	Approved Programmatic Prescribed Fire Plan	Refined Prescribed Fire Plan
	adjacent to a prescribed burn.	• Within 3 months leading up to the proposed burn window, Midpen will: - Update Midpen's website with information - Provide notification to key stakeholders • Within a reasonable period of time in advance of a burn day, Midpen will: - Install signage at the relevant OSP - Update Midpen's website with information - Notify adjacent neighbors/homeowner's associations - Provide notifications to key stakeholders and the relevant public -
Burn Ignition	• Conducted by hand using a drip torch or hand-held flare.	• Conducted by hand in most cases by using a drip torch but may include other equipment such as hand-held flare, hand launched devices, or similar methods or potentially aerial ignitions via a helicopter or unmanned aerial vehicle (UAV) for dangerous or difficult to access locations. Aerial ignitions often use a Plastic Sphere Dispenser, but may include helitorch operations. • Helicopter use in a maximum year could be for up to 5 days, 8 hours a day.[b]

[a] Estimated based on 10 separate 50-acre burn units with an assumption that 85 percent of the control lines are existing.

[b] These assumptions are for the environmental analysis and are not specifically identified in the PFP.

3 Evaluation

3.1 Aesthetics

3.1.1 Visual Characteristics

The WFRP EIR analysis concluded less than significant impacts on visual characteristics for the PFP. The refined PFP would involve increasing the average size of a single burn from 50 acres to 100 acres, and installing new control lines that would be 1.5 times as wide as the height of the fuel that will carry the fire. While the average number of acres burned annually increases in the refined PFP, the WFRP EIR analyzed a maximum of 500 acres burned annually, which has not changed under the refined PFP.

The new control lines would be installed through mowing, mastication, scraping, or wetting of fuels. The types of control lines proposed in the refined PFP are similar to the vegetation treatments discussed in the WFRP EIR VMP. As analyzed in the WFRP EIR, most control lines would use existing features including roads and trails. The use of existing control lines would account for 85 percent of the control lines used for prescribed burning, with the remaining 15 percent involving new control line installation. The width of the control line could be up to 30 feet wide, depending on the vegetation community present The method of vegetation treatment chosen for control line installation could result in a narrower control line than what would typically be needed for that individual vegetation community. In grassland communities, a control line may involve mowing a swath up to 10 feet in width. Control lines in shrub communities may need to be 20 to 30 feet wide. Forest communities may need a control line of 5 to 10 feet wide. The width of the control lines may be wider than analyzed in the WFRP EIR, depending upon vegetation community and other site-specific conditions. However, the use of mowing, mastication, and scraping for control lines would have similar effects to visual character as manual and mechanical vegetation treatments analyzed in the WFRP EIR under the VMP. Control lines installed through the wetting of fuels would involve hosing down a swath of vegetation prior to a prescribed burn, and would generally not include the removal of any vegetation that would change the visual characteristics of the area. The wetting of fuels may be combined with other control line installation techniques (i.e., mowing or mastication) that could alter the visual character of the site. Visual effects could occur from the short-term presence of equipment to perform the work, as well as from the long-term changes in vegetation patterns from completing the work. However, the change in visual character from control lines would be temporary and the vegetation would regrow. In most areas the control lines would be integrated with existing visual features, and in areas such as shrub communities be wider than analyzed but due to relatively short shrub heights would not substantially alter the visual impacts already described for this activity in the WFRP EIR. Therefore, the refined PFP would

not result in new or substantially more severe impacts to the visual character or quality of public views than those analyzed in the WFRP EIR.

3.1.2 Scenic Resources

The WFRP EIR analysis concluded significant and unavoidable impacts on scenic resources. As discussed in the WFRP EIR, scenic resources are located throughout Midpen lands and in many cases are viewable from State scenic highways. Prescribed burns may be conducted in areas visible from scenic viewpoints, trails, roads, and corridors, as analyzed in the WFRP EIR. Control lines may be installed adjacent to scenic resources and highways, which could alter the visual character of the vegetation. Mowing and mastication used for control line installation would thin vegetation that could be visible from scenic highways. Mowing and mastication would not clear all the existing vegetation, and the vividness, intactness, and unity of views would largely remain intact. Mowing and mastication treatments for control lines are similar to the shaded fuel break treatments analyzed in the WFRP EIR. Scraping control line treatments would clear vegetation and expose the soil surface, which would alter the density and composition of the vegetation. Wetting treatments would not change the density or composition of the vegetation, and the vegetation would remain intact. The impacts from control line treatments would be visible from scenic roads, trails, viewpoints, or corridors until the vegetation reestablishes. The refined PFP would implement MM Aesthetics-1 to assess and reduce visual impacts from control lines in State scenic highway corridors and modify treatments to reduce impacts where possible.

The increase in width of the control lines from six feet, as presented in the WFRP EIR, to up to 30 feet could increase the presence of invasive species in the control line as well as in adjacent areas thereby altering the visual characteristic of the vegetation. As discussed in the WFRP EIR, over many decades, non-native species may increase in dominance both within fuelbreaks (control lines) and in adjacent areas (Zouhar, Smith, & Sutherland, 2008). Studies have suggested a pattern that fuelbreaks (or control lines) may act as seed sources for burned sites compared to fuelbreaks in areas where there has not been a fire. As analyzed in the WFRP EIR, control lines would be rehabilitated after a prescribed burn. Rehabilitation would include the decommissioning of control lines as well as follow-up weed control. Control line decommissioning would generally be limited to the manual re-distribution of duff and brush back into the previous cleared lines. This spreads native seed back into the lines to facilitate natural revegetation. It also provides erosion control and discourages the formation of social trails. Because some weed seeds are stimulated by fire or become readily established in post-fire settings, prescribed burn sites will be patrolled by Midpen Early Detection Rapid Response (EDRR) crews for 1 to 5 years as needed following a burn event to identify the need for weeding or additional restoration work. The refined PFP would implement MM Biology-4 to minimize the spread of invasive species and forest diseases. Therefore, the refined PFP would not result in new or substantially more severe impacts to scenic resources than those analyzed in the WFRP EIR.

3.1.3 Light and Glare

The WFRP EIR analysis concluded less than significant impacts on light and glare. The refined PFP would not include any new sources of light or glare that would adversely affect day or nighttime views. The refined PFP would not introduce any permanent lighting or firefighting infrastructure that would require substantial light. The refined PFP would not result in new or substantially severe impacts from light and glare than those analyzed in the WFRP EIR.

3.2 Air Quality

3.2.1 Criteria Pollutants

The WFRP EIR presented the criteria pollutant emissions results of one scenario for the types of vegetation communities that could be burned in a maximum year, which included burning 10 percent grassland communities, 60 percent woodland communities, and 10 percent shrub communities. The WFRP EIR analysis concluded that potentially significant and unavoidable impacts on air quality from criteria air pollutant emissions could be possible from prescribed fire for all criteria pollutants (i.e., PM_{10}, $PM_{2.5}$, NO_x, ROG).

A few changes have been made to the refined PFP that could result in small increases in emissions estimates since the EIR. At the time of the WFRP EIR, it was not feasible to estimate the quantity of new control lines that may be needed in any one maximum year of prescribed burning. The fire professionals who helped develop the refined PFP were able to estimate the number of linear feet of new control lines that may be needed based on the number of existing control lines (e.g., trails) around the potential burn areas that are delineated in the refined PFP. The widths of the control lines have, additionally, been further refined based on the experience of the fire professionals. To provide flexibility to Midpen in the future when implementing more complex prescribed burns, the refined PFP also incorporates the possibility of using a helicopter or UAV to aerially ignite the burn rather than igniting by hand.

The air quality emissions were therefore re-calculated for prescribed burning given the changes associated with the PFP, namely for the SFBAAB, where emissions thresholds are based on annual emissions (versus maximum daily emissions for the North Central Coast Air Basin [NCCAB], which would not change since the maximum burning/work in any one day would not change). It was assumed for the refined air quality analysis for this Addendum that a light-lift helicopter could be implemented for aerial ignitions up to 5 days a year for 8 hours each day. Two additional potential scenarios for calculation of annual emissions for a maximum year of prescribed burning were also considered for this Addendum, aside from the scenario results presented in the WFRP EIR for the SFBAAB, which was limited to Scenario 1, below. Preliminary emission estimates incorporating the three SFBAAB burn scenarios and the parameters for new control lines and limited helicopter or UAV ignition were modeled to determine whether the new assumptions could result in a new or substantially more severe impact on air quality or greenhouse gas emissions than was accounted for in the WFRP EIR.

A summary of the three SFBAAB scenarios and the resultant impacts after modeling for this Addendum are as follows and are shown in detail in Table 3-1:

- **SFBAAB Scenario 1, involving 10 percent grassland communities, 60 percent woodland communities, and 30 percent shrub communities**
  - Resulted in the highest emissions of the activities that could be conducted annually in SFBAAB.
  - Annual emissions of NOx, ROG, PM_{10}, and $PM_{2.5}$ would exceed the emission thresholds.
- **SFBAAB Scenario 2, involving 60 percent grassland communities, 30 percent woodland communities, and 10 percent shrub communities**
  - Resulted in the lowest annual emissions out of the three scenarios.
  - Annual emissions of NOx, ROG, PM_{10}, and $PM_{2.5}$ would exceed the emission thresholds.
- **SFBAAB Scenario 3, involving 45 percent grassland communities, 25 percent woodland communities, 10 percent shrub communities, and 20 percent mixed conifer/hardwood communities**
  - Annual emissions of NOx, ROG, PM_{10}, and $PM_{2.5}$ would exceed the emission thresholds.

The SFBAAB Scenario 1 and associated control line creation would result in the greatest emissions of the three scenarios as part of the refined PFP. Based on the current emission estimates, the increase in emissions for pollutants, in comparison to those presented in the WFRP EIR (for Scenario 1), for which the Bay Area Air Quality Management District (BAAQMD) has significance thresholds[1] is approximately 11 percent. Based on the preliminary calculations, it appears likely that the increase in emissions associated with refinements in the PFP and assumptions could result in slightly greater impacts associated with criteria pollutants and greenhouse gas emissions than were identified in the WFRP EIR; however, the impacts are not new, were already described as significant and unavoidable, and are only incrementally and not substantially more severe. The same mitigation as identified in the WFRP EIR would still apply.

[1] Note that an error in the emission rate of carbon monoxide (CO) for prescribed burning in woodland communities resulted in an erroneously low quantity of emissions reported in the WFRP EIR. This is shown with corrected emission rates in the addendum Table 3-1. There is no BAAQMD significance threshold for CO.

3 EVALUATION

Table 3-1 Criteria Pollutant Emissions Generated During Baseline Conditions and the Maximum Year of Implementation

Pollutant	Maximum Year of Implementation								
	Total Baseline Conditions Emissions	Vehicles and Equipment	Prescribed Burn	Pile Burn	Helicopter	Total Program Emissions	Net Emissions	Applicable Significance Thresholds	Exceedance?
Annual Emissions in SFBAAB (Tons/Year) – Scenario 1 (parenthesis are the values presented in the WFRP Final EIR)									
PM_{10}	0.82	9.34	117.43	1.71	0.02	**128.49** (113.41)	**127.67** (113)	15	Yes
$PM_{2.5}$	0.09	1.07	99.53	1.49	0.00	**102.08** (92.26)	**101.98** (92)	10	Yes
NOx	0.11	1.36	8.48	0.44	0.08	**10.36** (11.18)	**10.25** (11)	10	Yes
ROG	0.02	0.46	52.89	0.50	0.03	**53.87** (49.06)	**53.85** (49)	10	Yes
CO	1.40	34.95	1246.55	8.38	0.03	1289.91 (196.72)	1288.51 (194)	-	-
SOx	0.00	0.01	6.70	0.23	0.01	6.95 (not reported)	6.95 (not reported)	-	-
Annual Emissions in SFBAAB (Tons/Year) – Scenario 2									
PM_{10}	0.82	8.43	59.40	1.71	0.02	**69.56**	**68.74**	15.	Yes
$PM_{2.5}$	0.09	0.96	50.30	1.49	0.00	**52.75**	**52.66**	10	Yes
NOx	0.11	1.35	5.03	0.44	1.35	**6.90**	6.79	10	Yes
ROG	0.02	0.45	25.72	0.50	0.03	**26.70**	**26.68**	10	Yes
CO	1.40	34.92	624.68	8.38	0.03	668.01	666.60	-	-
SOx	0.00	0.01	3.63	0.23	0.01	3.88	3.88	-	-

Pollutant	Maximum Year of Implementation								
	Total Baseline Conditions Emissions	Vehicles and Equipment	Prescribed Burn	Pile Burn	Helicopter	Total Program Emissions	Net Emissions	Applicable Significance Thresholds	Exceedance?
Annual Emissions in SFBAAB (Tons/Year) – Scenario 3									
PM_{10}	0.82	8.39	80.44	1.71	0.02	**90.55**	**89.73**	15	Yes
$PM_{2.5}$	0.09	0.96	68.14	1.49	0.00	**70.58**	**70.49**	10	Yes
NOx	0.11	1.35	6.48	0.44	0.08	**8.35**	8.23	10	Yes
ROG	0.02	0.45	22.32	0.50	0.03	**23.30**	**23.28**	10	Yes
CO	1.40	34.91	850.06	8.38	0.03	893.39	891.98	-	-
SOx	0.00	0.01	4.81	0.23	0.01	5.07	5.06	-	-

Notes:

Bold indicates a value exceeds thresholds.

Numbers may not add due to rounding.

The WFRP EIR also identified significant unavoidable impacts within the NCCAB from a prescribed burn. Only a small portion of the project area falls within the NCCAB (approximately 3 percent) and prescribed burning would only occur once or twice in a few decades under the WFRP. The analysis in the WFRP EIR is unchanged for prescribed burning under the refined PFP in the NCCAB since the NCCAB's significance criteria are based on maximum daily emissions. The amount of prescribed burn activity in any one day in NCCAB would not change.

3.2.2 Health Risk

The WFRP EIR analysis concluded significant and unavoidable impacts on sensitive receptors from pollutant concentrations. As analyzed in the WFRP EIR, equipment and vehicles would be used during pre-treatment, the burn, and mop up of the burn, which could disturb serpentine soils and expose workers to asbestos dust. Prescribed burn activities would release smoke, which could expose workers, recreationalists, and the public to TAC emissions, including $PM_{2.5}$. The effect on Midpen employees and sensitive receptors from prescribed burning activities could be significant. The WFRP EIR analyzed the impacts of prescribed burns on sensitive receptors. The approved mitigation measures (MM Air Quality-3, MM Air Quality-4, MM Hazards-3) would be implemented for the refined PFP to reduce impacts on sensitive receptors, although the impact would still remain significant and unavoidable. The refined PFP would not result in new or substantially more severe significant impacts on sensitive receptors than those analyzed WFRP EIR as the types of, locations of, and maximum annual prescribed burning is unchanged.

3.3 Biological Resources

The WFRP EIR analysis concluded less than significant impacts with mitigation on biological resources. The refined PFP may involve the installation of wider control lines than analyzed in the WFRP EIR, depending upon vegetation community and other site-specific conditions. Only an estimated 15 percent of the control lines are anticipated to require new installation via mowing, mastication, or wetting of vegetation, and a fraction of those new control lines could extend up to 30 feet in width, depending on the vegetation community present. The refined PFP would also allow for an increase in the potential acres burned in any single burn from 50 acres to 100 acres. However, the WFRP EIR analyzed a maximum of 500 acres burned annually, which remains the same in the refined PFP.

The impact of prescribed burning and control lines on sensitive communities and special-status species was analyzed in the WFRP EIR. The WFRP EIR analyzed the effects of prescribed burns on individual sensitive communities found throughout Midpen lands. Prescribed fire has varied effects on special-status plants and wildlife, depending on the species. The prescribed burns outlined in the refined PFP would not result in additional or new impacts to sensitive communities or special-status species than analyzed in the WFRP EIR. MM Biology-1, MM Biology-2, and MM Biology-2 would be implemented to reduce the impact of the project on special-status species under the refined PFP to less than significant levels.

Control lines could increase the presence of invasive species as analyzed in the WFRP EIR. The increase in width of the control lines could increase the presence of invasive species within and adjacent to the lines. The types of control lines proposed in the refined PFP are similar to but of a much smaller scale than the vegetation treatments that were analyzed under the VMP in the WFRP EIR. The control lines would be rehabilitated after burn events to minimize the spread of invasive species. As discussed previously, control line decommissioning would generally be limited to the manual re-distribution of duff and brush back into the previous cleared lines. Midpen EDRR crews would patrol prescribed burn sites for 1 to 5 years following a burn event to identify the need for invasive species control or restoration work. The refined PFP would implement MM Biology-4 to minimize the spread of invasive plant species, and MM Biology-17 which requires survey of prescribed burn areas by a qualified biologist. MM Biology-5 would be implemented under the MM Biology-5 which specifies the data collection and monitoring frequency for Midpen's EDRR program and success criteria. The refined PFP would not result in dissimilar effects than was analyzed in the WFRP EIR prior to mitigation measures or new or substantially more severe significant impacts on biological resources than those analyzed in the WFRP EIR with incorporation of mitigation measures.

3.4 Cultural Resources

The WFRP EIR analysis concluded less than significant impacts with mitigation on cultural resources. The refined PFP would involve increasing the average acres of Midpen land burned at individual burns and potentially installing wider control lines. However, the refined PFP would not change the maximum 500 acres a year of land burned annually that was analyzed in the WFRP EIR. Impacts on eligible historic resources would remain the same as those analyzed in the WFRP EIR. Most prescribed burning would not affect cultural resources more than 7 centimeters below the surface as analyzed in the WFRP EIR. The refined PFP would increase the width of the new control lines from six feet to up to 30 feet. While the control lines would be wider than those analyzed in the refined PFP, it is estimated that 85 percent of the control lines needed for a maximum year of burning would utilize existing roads and trails. Only an estimated 15 percent of the control lines are anticipated to require new installation via mowing, mastication, or wetting of vegetation. Mowing, mastication, and wetting of vegetation treatments would not result in ground disturbance that could affect cultural resources. Scraping treatments for control lines could potentially uncover or discover previously undiscovered resources. However, scraping would generally remove surface vegetation and not reach depths below 7 centimeters from the soil surface. Midpen requires staff at each site to receive training in the recognition of sensitive cultural resources and to halt work in the event of any cultural-resource discovery until a qualified archaeologist can evaluate the significance of the find (IPMP BMP 26). The approved mitigation measures (MM Cultural-1 through MM Cultural-2) would be implemented for the refined PFP to reduce impacts on cultural and historic resources. The refined PFP would not result in dissimilar effects than was analyzed in the WFRP EIR prior to mitigation measures or new or substantially more severe significant impacts on cultural and

historic resources than those analyzed in the WFRP EIR with incorporation of mitigation measures.

3.5 Geology and Soils

The WFRP EIR analysis concluded less than significant impacts with mitigation on geology and soils. Prescribed burns would require control lines that could result occasionally in additional denuded areas that are more prone to erosion and landslide risk. Annual burning in the refined PFP would average 100 acres, but the maximum number of acres burned annually would be 500, as analyzed in the WFRP EIR. Prescribed burning would result in the removal of vegetation on the surface, increasing the potential for erosion and soil instability in the burned area. The types of control lines proposed in the refined PFP are similar to but of a much smaller scale than the vegetation treatments, specifically fuelbreaks and disclines, that were analyzed under the VMP in the WFRP EIR. The control lines would be allowed to reestablish after burning and would not be maintained as cleared areas (in contrast to fuelbreaks). The control lines would be rehabilitated with native seedbank post-burning in order to minimize erosion and soil instability. The approved mitigation measures (MM Geology-2 and MM Geology-3) would be implemented for the refined PFP to reduce impacts from soil erosion or the loss of topsoil. The refined PFP would not result in new or substantially more severe significant geology and soils impacts than those analyzed in the WFRP EIR.

3.6 Greenhouse Gas Emissions

The WFRP EIR analysis concluded significant and unavoidable impacts on greenhouse gas emission (GHG). GHG emissions generated during prescribed burning and pre-treatment activities could increase under the refined PFP, as described in Section 3.2. GHG emissions associated with the refined PFP would be generated from equipment and vehicles, emissions from pile burning, emissions from prescribed burning, and emissions from helicopters as shown in Table 3-2. Under Scenarios 2 and 3, the total maximum year program emissions and net emissions are less than the GHG emissions analyzed in the WFRP EIR. Under Scenario 1, GHG emissions are higher than the emissions analyzed in the WFRP EIR. GHG emissions would increase by approximately 12 percent under Scenario 1 in comparison to the WFRP EIR, which would not constitute a substantial increase in the previously analyzed level of significant and unavoidable impacts.

As discussed in the WFRP EIR, a Smoke Management Plan must be prepared and implemented for prescribed burns in SFBAAB per BAAQMD's Regulation 5, and prescribed burns in MBARD (should a prescribed burn occur in the less than 3 percent of Midpen lands within the MBARD) must adhere to smoke management requirements in accordance with Rule 438, which would minimize some GHG emissions due to adhering to seasonal and daily timing restrictions. While GHG emissions increased under Scenario 1, as shown in Table 3-2, it is expected that wildland fire on Midpen lands, without the treatments outlined in the refined PFP, would result in even higher GHG emissions. Studies have shown that implementing prescribed burns reduces GHG

emissions by 18 to 25 percent in statewide emissions for states in the western U.S. compared to wildland fires (Wiedinmyer & Hurteau, 2010). Additionally, Midpen would be required to implement MM Air Quality-2 to reduce emissions associated with a prescribed burn under the refined PFP. The increase in GHG emissions associated with the refined PFP would be incrementally greater but would not result in new or substantially more severe impacts on GHG emissions than those analyzed in the WFRP EIR.

Table 3-2 Annual GHG Emissions Generated During Baseline Conditions and the Maximum Year Implementation ($MTCO_2e$)

Activity	Total Baseline Conditions Emissions	Total Maximum Year Program Emissions	Net Emissions
Annual Emissions - Scenario 1 (parenthesis are the values presented in the WFRP Final EIR)			
Equipment and Vehicle Emissions	36.71	566.11 (422.03)	529.40 (385.53)
Pile Burning	0.73	366.92 (366.92)	366.19 (366.19)
Prescribed Burning	-	10,453.76 (9,423.10)	10,453.76 (9,423.10)
Helicopter	-	25.54 (not included)	25.54 (not included)
Total GHG Emissions	**37**	**11,412 (10,212)**	**11,375 (10,175)**
Annual Emissions- Scenario 2			
Equipment and Vehicle Emissions	36.71	566.11	518.09
Pile Burning	0.73	366.92	366.19
Prescribed Burning	-	5,668.48	5,669.48
Helicopter	-	25.54	25.54
Total GHG Emissions	**37**	**6,627**	**6,578**
Annual Emissions - Scenario 3			
Equipment and Vehicle Emissions	36.71	566.11	517.32
Pile Burning	0.73	366.92	366.19
Prescribed Burning	-	7,498.53	7,498.53
Helicopter	-	25.54	25.54
Total GHG Emissions	**37**	**8,457**	**8,408**

3.7 Hazards and Hazardous Materials

3.7.1 Hazardous Materials

The WFRP EIR analysis concluded less than significant impacts on the environment from hazardous materials. Prescribed burns and control lines implemented under the refined PFP would use equipment and vehicles that could result in leaks and spills. As analyzed in the WFRP EIR, fueling and fuel spills would be handled according to Midpen's spill-prevention and handling of hazardous materials BMPs. Three hazardous-materials sites listed under California Government Code Section 65962.5 remain open on Midpen lands at Sierra Azul OSP, Miramontes OSP, and Ravenswood OSP. Ground-disturbing activities associated with prescribed burns and pre-treatment using control lines could place workers at risk from exposure to contaminated soil and materials. Midpen would be required to implement MM Hazards-1 to reduce the impact on workers and the environment from existing hazards under the refined PFP. An increase in the number of prescribed burns, but not the total annual acreage burned, would not generate sufficient smoke to affect air traffic. As analyzed in the WFRP EIR, prescribed burning or control line installation could require lane or full-road closures that could interfere with evacuation routes. Midpen would implement MM Transportation-1, which requires making provisions for emergency responders to travel through any work area or to clearly designate alternate routes. Therefore, the refined PFP would not result in new or substantially more severe impacts on the environment from hazardous materials than those analyzed in the WFRP EIR.

3.7.2 Wildfire Risk

The WFRP EIR analysis concluded less than significant impacts with mitigation on hazards and hazardous materials from wildland fire risks. As discussed in the WFRP EIR, prescribed fires could escape and become wildland fires. Equipment and vehicles used prior to, during, and after the burn could spark and ignite a wildland fire. The implementation of control lines provides a natural barrier for prescribed fires. Leading up to a burn day, the refined PFP identifies guidelines for Midpen outreach including, but not limited to, the installation signage at the relevant OSP, notifying adjacent neighbors/homeowner's associations and key stakeholder, and updating Midpen's website with burn information. These notification guidelines are in addition to the mitigation measures adopted in the WFRP EIR. For a burn less than 50 acres, individuals and jurisdictions within 1 mile of the burn would be notified of the burn and for burns larger than 50 acres, Midpen would determine the extent of the region that would be notified of the burn at least two days prior to a burn day per MM Air Quality-2, as analyzed in the WFRP EIR. Midpen would be required to implement MM Hazards-3 of the WFRP EIR that requires installation of temporary signage on public roads, if not closed, at intervals ahead of and adjacent to a prescribed burn. Midpen would be required to implement MM Hazards-3 and MM Air Quality-2 to reduce the impact of significant risk of loss, injury, or death involving wildland fires while working under the refined PFP, which would minimize impacts to less than significant levels.

The increase in the number of prescribed burns and use of vehicles and equipment could increase the risk of accidental wildland-fire ignition. As analyzed in the WFRP EIR, Midpen would be required to implement fuel-spill prevention measures and train workers on fire prevention and suppression. Additionally, each Burn Plan includes contingency planning in the event of escape or accidental ignitions. The use of existing or installation of control lines would serve as a natural barrier for prescribed burns and reduce the risk of a wildland fire from prescribed burning. The overall purpose of the refined PFP is to reduce wildland fire risks on Midpen lands using prescribed burns to manage fuels and improve ecosystem health. Therefore, the refined PFP would not result in new or substantially more severe impacts on hazards and hazardous materials from wildland fire risks than those analyzed in the WFRP EIR.

3.7.3 Slope Destabilization

The WFRP EIR analysis concluded less than significant impacts with mitigation on hazards and hazardous materials from slope instability. Prescribed burns and control lines have the potential to increase slope instability from changing the soil profile. As analyzed in the WFRP EIR, control lines could result in denuded areas that are more prone to landslides. Control line treatments include mowing, mastication, scraping, and wetting of vegetation. Mowing, mastication, and wetting of vegetation treatments for control lines would not result in ground disturbance that could increase slope instability. Scraping treatments for control lines up to 30 feet in width would only be needed occasionally in shrubland communities, but could expose the soil surface and could result in slope instability or landslides. Control line treatments would be temporary and vegetation would regrow. As discussed previously, control lines would be rehabilitated after burning to revegetate the lines with native seedbank that would reduce the effects of erosion. Midpen would be required to implement MM Geology-2 and MM Geology-2 to reduce the exposure of people or structures to significant risks to less than significant levels, including landslides, post-fire slope instability, or drainage changes while working under the refined PFP. The work under the refined PFP, therefore, would not result in new or substantially more severe impacts from hazards than those analyzed in the WFRP EIR.

3.8 Hydrology and Water Quality

3.8.1 Drainage Alteration and Erosion

The WFRP EIR analysis concluded less than significant impacts with mitigation on hydrology and water quality from substantial erosion. Implementation of prescribed burns and control lines could result in water-quality impacts from increased erosion. Pre-treatment activities to create or maintain control lines and prescribed burns would involve use of vehicles, heavy equipment, and pile burning. The increase in the number of annual prescribed burns would increase the use of vehicles and equipment for pre-treatment activities and prescribed burning, which could impact water quality from increased erosion. As discussed in the WFRP EIR, additional water-quality impacts from vehicle access could occur if a spill of fuels or lubricants were to occur in or near waterbodies or waterways. Midpen would be required to implement

MM Hydrology-1 and MM Hydrology while working under the refined PFP, which would reduce impacts to less than significant levels.

Mowing, mastication, and scraping treatments for control line installation are similar to the vegetation treatments discussed in the WFRP EIR. The technique of wetting the vegetation prior to prescribed burning would not result in any vegetation removal. Thus, wetting the vegetation would not result in sedimentation or siltation of waterways. Similar to the previously analyzed discing, scraping would involve removing the surface layer of vegetation, exposing the soil surface, which could lead to sedimentation or siltation of nearby waterways and waterbodies. The approved mitigation measures (MM Geology-2 and MM Geology-3) would be implemented for the refined PFP to reduce the impacts related to sedimentation of waterways and waterbodies to less than significant levels.

3.8.2 Groundwater

The WFRP EIR analysis concluded less than significant impacts on hydrology and water quality from groundwater use. Implementing the changes presented in the refined PFP would not substantially decrease groundwater supplies or interfere with groundwater recharge. Water for wetting control lines or fire control during a prescribed burn could be purchased from an existing source or from existing entitlements held by Midpen, as discussed in the WFRP EIR. The refined PFP would not result in new or substantially more severe impacts on groundwater than those analyzed in the WFRP EIR.

3.8.3 Drainage Pattern Alteration

The WFRP EIR analysis concluded less than significant impacts with mitigation on hydrology and water quality from alteration of the existing drainage pattern. Physical alteration of streams or rivers would not occur under the refined PFP. Unintentional alteration of streams or rivers could occur from landslides or debris flows resulting from the installation of control lines and the increased number of prescribed burns could or from sedimentation as a result of erosion, which would be a significant impact if alterations were substantial. Implementation of prescribed burns and control lines could also expose soils and potentially alter drainage patterns through increased surface runoff. The approved mitigation measures (MM Hydrology-1 and MM Geology-2) would be implemented to minimize drainage changes that could alter the existing drainage pattern of the area to less than significant levels. The refined PFP would not result in new or substantially more severe impacts to water quality than those analyzed in the WFRP EIR.

3.9 Noise

Noise effects associated with implementation of the programmatic PFP, including pre-treatment, prescribed burning, and mop up equipment use and activities, were analyzed in the WFRP EIR. The WFRP EIR determined that impacts from generation of a substantial temporary or permanent increase in ambient noise levels in excess of noise standards would be less than significant with mitigation. Since certification of the WFRP EIR, the noise environment has not

changed from the ambient noise environment identified in the WFRP EIR. Equipment used during implementation of the refined PFP (i.e., pre-treatment, during burn, mop up after burn) would not be significantly different than those analyzed in the approved WFRP EIR. Therefore, the refined PFP would not generate excessive groundborne vibration or groundborne noise levels. As analyzed in the WFRP EIR, noise generated by equipment used in a prescribed burn conducted near a residence or sensitive receptor could result in a significant impact. The approved mitigation measures (MM Noise-1 and MM Hazards-3) would be implemented for the refined PFP to reduce the impacts related to noise to less than significant levels.

The potential use of a helicopter for aerial ignitions would result in a new source of noise that was not previously analyzed in the WFRP EIR; however, it is not considered a new impact because it would generate the same general types of operational noises described under the WFRP and that occur under current baseline conditions. Light-lift helicopters can result in estimated noise levels of 90 dBA effective perceived noise and approximately 97 dBA L_{max} 100 feet away during takeoff, which is louder than other equipment analyzed in the WFRP EIR (TRC, 2015; FTA, 2001; Falzarano & Levy, 2007). A helicopter would be closest to the ground and therefore, the most audible when taking off, landing, or hovering near the ground, which occurs for a limited duration. Helicopters may use existing helispots that are mapped on Midpen lands for refueling and in between flights, or could return from where the helicopter originated. Most helispots on Midpen lands are further away from noise-sensitive receptors. Helicopters, if used, would be operated to ignite burn units that have dense brush, steep slopes, or difficult access in the interior of the unit that make it challenging to maintain the safety of firefighters conducting ignition by hand. Noise generated from helicopters could impact recreationalists who are considered sensitive receptors in the WFRP EIR. However, trails within and adjacent to the burn unit, where the helicopter would be utilized, would be closed to recreationalists prior to and during the prescribed burn. Generally, burn units that meet this criteria would be further from communities and sensitive receptors than other noise-generating activities under the WFRP. As such, a helicopter hovering to ignite a prescribed burn would generally not be located directly adjacent to sensitive receptors.

None of the noise standards identified by the Noise Ordinances for San Mateo County, Santa Clara County, or Santa Cruz County establish a definitive noise threshold that would apply to Midpen activities under the Program during daytime hours and helicopter use would not occur for substantial time periods within proximity of sensitive receptors. Therefore, due to the limited duration of helicopter use for aerial ignitions that would generally be conducted in remote areas away from sensitive receptors, the impact would be less than significant. . The refined PFP would not result in new or substantially more severe impacts from noise than those analyzed in the WFRP EIR.

3.10 Recreation

The WFRP EIR analysis concluded less than significant impacts with mitigation on recreation. The refined PFP would increase the average acres of a single prescribed burn from 50 to 100

acres annually and install new control lines. While the average size of a single burn increased under the refined PFP, the maximum of up to 500 acres burned annually would remain the same as the WFRP EIR. The increase in the number of prescribed burns and new control lines could potentially increase the number of trail and road closures. Approximately 85 percent of the control lines used annually for a maximum year of burning would utilize existing roads and trails, which may require road and trail closures and more burns may occur annually than identified in the programmatic PFP, although the maximum acres of prescribed burning would remain the same. While the refined PFP may require more trail and road closures than previously specified, ample recreational opportunities are available across and surrounding Midpen land that displaced recreationalists could use if discrete areas are unavailable due to pre-treatment or prescribed burns. Additionally, control lines and prescribed burn activities would be temporary and for a short duration. As analyzed in the WFRP EIR, recreationalists could be affected by the disturbance of the fire and presence of equipment as well as by safety concerns, such as smoke inhalation. The approved mitigation measure MM Hazards-3 would require trail closure to the public within at least 500 feet of the edges of a prescribed burn and would reduce any potential impacts to less than significant levels. Implementation of the refined PFP would not result in a new or substantially more severe significant impacts on recreation than those analyzed in the WFRP EIR.

3.11 Transportation

The WFRP EIR analysis concluded less than significant impacts with mitigation on transportation. The refined PFP would increase the average acres of single prescribed burns from 50 to 100 acres, but the maximum acres of land burned annually would remain 500 acres, as analyzed in the WFRP EIR. As such, while the refined PFP may require more vehicle trips associated with workers, the average daily number of worker and truck trips is anticipated to be similar to those analyzed in the WFRP EIR. The refined PFP would not modify or redesign or change the use of existing roadways or intersections. As analyzed in the WFRP EIR, prescribed burns could pose a hazard to motorists or bicyclists from smoke obscuring visibility. The refined PFP requires public outreach and notification for upcoming prescribed burns. At a minimum, public outreach prior to a prescribed burn would include information regarding the location of the burn, the fire agency partner(s) involved, the potential burn window, the objectives of the burn, and the contact information for the burn coordinator. Public outreach prior to a burn would allow potential motorists or bicyclists to avoid the burn area, thus reducing the hazard of smoke obscuring visibility. The approved mitigation measures (MM Hazards-3) would be implemented for the refined PFP to reduce the impacts related to roadway users and workers to less than significant levels. Lane and road closures may be required for prescribed burning activities that could slow or prevent emergency access. The approved mitigation measure MM Transportation-1 would be implemented for work under the refined PFP to ensure that emergency vehicles are provided access. The refined PFP would not result in new or substantially more severe significant impacts on traffic than those analyzed in the WFRP EIR.

3.12 Other CEQA Topics

3.12.1 Changes in Land Use that Commit Future Generations

The refined PFP would not result in a change to the zoning or land use designations on Midpen lands. The refined PFP would not commit future generations to significant changes in land use as the WFRP is a vegetation management tool and would not result in changes in land use.

3.12.2 Consumption of Non-Renewable Resources

The refined PFP would use vehicles, equipment, and helicopters that would consume energy including gas, diesel, and power. Vehicle engines and fuel used during implementation of the project would comply with State and local energy reduction and efficiency requirements. Implementation of the refined PFP would not significantly increase consumption of energy in the region or state or result in inefficient energy use and would not include the construction of new facilities that would require energy. The proposed fuel consumption would, additionally, be considered beneficial and not wasteful given the positive outcome of the work to reduce wildland fire risk and establish healthy, resilient, and fire-adapted ecosystems.

3.12.3 Irreversible Damage from Environmental Accidents

The refined PFP would use vehicles and equipment, which could result in the leakage or spillage of fuels. Midpen would be required to implement fuel-spill prevention measures. As discussed in the WFRP EIR, workers handling hazardous materials would be required to adhere to OSHA and Cal/OSHA health and safety requirements. If spills were to occur, they would be addressed through implementation of Midpen's spill-prevention BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6).

An increase in the number of prescribed burns conducted annually could increase the potential for accidentally starting a wildland fire if the burns were to become uncontrolled. Prescribed burns are planned for and conducted under optimal weather conditions (e.g., cool temperatures, high humidity, low wind) to ensure fire fighters can maintain control. Midpen would prepare a Burn Plan that would limit the potential for escape of a prescribed fire, as discussed in the WFRP EIR. Burn units are discrete units of land that will be treated under a single prescribed Burn Plan. Burn Plans are prepared by a qualified burn plan preparer, who is either a qualified prescribed fire Burn Boss or competent trainee. As discussed in the refined PFP, the unit-level Burn Plan would describe burn unit safety, including potential hazards and mitigations. Burn Plans may incorporate additional unit-level BMPs, including BMPs to ensure the control of the burn. Contingency planning for excessive smoke production and a wildfire declaration element are a part of every Burn Plan, which describes how the Burn Boss and staffing resources will regain control of the fire should it move outside of established control lines. Midpen would also be required to implement MM Hazards-3 to reduce the impact of prescribed burns on recreationalists and structures to less than significant levels. Implementation of the refined PFP would not result in a new potential for irreversible damage as a result of an environmental accident.

3.12.4 Growth-Inducing Impacts

Implementation of the refined PFP would involve burning up to 500 acres annually and would require the installation of new control lines, which could require a greater number of workers. Since control line estimates are available in the refined PFP, additional workers may be needed for control lines or larger burns. However, any additional workforce for this type of activity would not be substantial so as to induce population growth. The workers would be sourced from the existing and project populations in San Mateo County, Santa Clara County, and Santa Cruz County. The refined PFP aims to reduce fuel loads and fire risk that could impact nearby communities, but would not change development patterns or policies, or result in any land use changes that could result in direct or indirect impacts on population growth, same as analyzed in the WFRP EIR.

4 Determination

No new or substantially more severe significant impacts would occur as a result of the refined PFP. No new substantial changes would occur with respect to the circumstances under which the refined PFP would be undertaken. The mitigation measures and determination of significance for impacts included in the adopted WFRP EIR would continue to be valid. None of the conditions described in CEQA Guidelines Section 15162 requiring the preparation of a subsequent EIR or CEQA Guidelines Section 15163 requiring preparation of a supplemental EIR have occurred. This addendum to the adopted WFRP EIR is the appropriate level of environmental review for the project revisions, as identified in CEQA Guidelines Section 15164.

5 References

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APPENDIX A MITIGATION, MONITORING, AND REPORTING PROGRAM

Mitigation, Monitoring, and Reporting Program

Introduction

When approving projects with mitigation measures that if implemented would avoid or lessen significant impacts, CEQA requires public agencies to adopt monitoring and reporting programs or conditions of project approval to mitigate or avoid the identified significant effects (Public Resources Code Section 21081.6(a)(1)). A public agency adopting measures to mitigate or avoid the significant impacts of a proposed project is required to ensure that the measures are fully enforceable through permit conditions, agreements, or other means (Public Resources Code Section 21081.6(b)). The mitigation measures required by a public agency to reduce or avoid significant project impacts not incorporated into the design may be made conditions of project approval as set forth in a Mitigation Monitoring and Reporting Program (MMRP). The MMRP must be designed to ensure project compliance with mitigation measures during project implementation. The MMRP for the Program is detailed in Table 1.

Midpen will use the Project Environmental Review Checklist, provided in Appendix A of this Final EIR, to evaluate if impacts of individual projects are covered in the Program EIR and to identify best management practices and mitigation measures that are applicable to those individual projects. Individual projects that do not conform to the scope of the Program EIR may require additional environmental analyses under CEQA.

Format

This MMRP is organized in a table format, keyed to each significant impact and mitigation measure. Each mitigation measure is set out in full, followed by a tabular summary of monitoring requirements. The column headings in the tables are defined as follows:

- **Mitigation Measure.** This column presents the significant impact and full mitigation measure.
- **Implementation Responsibility.** This column assigns the party responsible for implementation of the measures
- **Monitoring Responsibility.** This column assigns the party responsible for monitoring implementation.
- **Timing and Performance Standards:** This column identifies at which stage of the project mitigation must be completed. Performance standards are identified that must occur during the specified stage of project implementation to determine that the objectives of the mitigation are met.

Enforcement

This MMRP will be incorporated as a condition of project approval. All mitigation measures must be carried out to fulfill the requirements of approval.

MITIGATION, MONITORING, AND REPORTING PROGRAM

Table 1 Wildland Fire Resiliency Program Mitigation, Monitoring, and Reporting Program

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
Aesthetics					
MM Aesthetics-1: Reduction of Visual Impacts from Scenic Roads, Corridors, Trails, and Viewpoints from VMAs • Midpen shall conduct a visual reconnaissance of any planned VMAs during the annual planning process, prior to implementation of the VMA. The reconnaissance shall only apply to VMAs, based on desktop review, that could have the potential to be visible from a designated scenic road, corridor, trail, or viewpoint. • If Midpen identifies that a VMA would fall within an area with lengthy views from a scenic road, corridor, trail, or viewpoint (i.e., longer than a few minutes) of a proposed treatment area, and would degrade the view by changing the existing character or opening up a less scenic view, Midpen will, before implementation, identify any change in location or design (such as avoid areas or reduce degree of thinning) of the VMA to reduce impacts to scenic areas and public views. • If no changes are available that would reduce impacts to public viewers and that could achieve the intended wildland fire risk reduction objectives of the proposed treatment, Midpen will thin and feather adjacent vegetation to break up the linear edges of treatment areas and strategically preserve vegetation at the edge of the treatment area to help screen public views and minimize the contrast between the treatment area and surrounding vegetation.	Midpen and/or Contractor	Midpen	Throughout Midpen lands.	**Before Activity:** Conduct desktop review to determine visibility of VMAs, conduct visual reconnaissance where appropriate to avoid scenic viewpoints, where feasible. Modify design and locations, where possible. **During Activity:** N/A **After Activity:** N/A	
MM Aesthetics-2: Guidelines for Design of Roads, Landing Zones, or Staging Areas New roads, landing zones, and staging areas (firefighting infrastructure) shall be designed in accordance with the following guidelines, as feasible: • Locate new firefighting infrastructure away from ridgelines. • Maximize natural conditions of the area surrounding infrastructure (e.g., mowed grass cover versus hardened surface). • Minimize recontouring of hills and natural topography. • Minimize hillside cuts that run against the contours; follow contours to the greatest extent possible. • Avoid large rocks and mature, healthy trees.	Midpen and/or Contractor	Midpen	Throughout Midpen lands.	**Before Activity:** Design firefighting infrastructure to meet the guidelines. **During Activity:** N/A **After Activity:** N/A	
Air Quality					
MM Air Quality-1: Fugitive Dust Control Measures for Infrastructure Installation At a minimum, the following control measures must be implemented during construction: • When moisture content is low enough to create dust, all exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered or treated with a non-synthetic dust palliative (e.g., organic nonpetroleum products) as often as needed to control dust emissions. • All haul trucks transporting soil, sand, or other loose material off site shall be covered. • Vehicle ingress and egress locations shall be stabilized to minimize erosion and sediment transfer. • For Program activities involving grading or excavation conducted directly off public roads, all visible mud or dirt track-out onto adjacent public roads shall be removed. The use of dry power sweeping is prohibited on public roads. • All vehicle speeds on unpaved roads shall be limited to 15 mph, in accordance with Midpen policy (LU Regulations Section 500.1; MO Manual 07.005). • All roadway, driveway, and sidewalk paving shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • A publicly visible sign shall be posted with the telephone number and person to contact at Midpen regarding dust complaints. Midpen shall respond and take corrective action within 48 hours. The applicable air district's (e.g., BAAQMD or MBARD) phone number shall also be visible to ensure compliance with applicable regulations. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, § 2485 of CCR). Clear signage shall be provided for construction workers at all access points.	Contractor	Midpen	Areas with grading or blading.	**Before Activity:** Post a publicly visible sign with contact information for the public to make dust complaints. **During Activity:** (1) Water exposed surfaces twice a day, (2) cover filled haul trucks, (3) adequately manage soil track-out, (4) limit vehicle speeds, (5) limit idling to 5 consecutive minutes, and (6) have construction equipment maintained by a certified mechanic. **After Activity:** N/A	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
• Construction equipment shall be properly maintained by a certified mechanic.					
MM Air Quality-2: Burn Emission Reduction Techniques For activities within a small portion of Long Ridge OSP and a very small portion of Sierra Azul OSP that falls within the NCCAB, Midpen shall limit pile burning to 8.8 tons (i.e., not more than nine 10-foot-wide by six-foot-high parabolic piles of shrub/hardwood vegetation or equivalent) in any one day. Midpen shall incorporate the following measures during planning and implementation of a prescribed burn: • When considering a prescribed burn, weigh the habitat benefits of burning in a particular vegetation type against the emissions. • Reduce the total area burned through mosaic burning if the objectives of the burn can still be met. • Burn when fuels have appropriate fuel moisture content, as determined by the expert preparing the Smoke Management Plan. • Reduce fuel loading by decreasing the density of vegetation and other fuels before ignition using mechanical treatments, manual treatments, prescribed herbivory, and pile burning when logistically appropriate. • Schedule burns before new vegetation growth increases fuel loads, when logistically appropriate. • Delay planned burns when a Spare the Air Burn Ban has been declared. • Provide public notification at least 48 hours in advance of a burn less than 50 acres to individuals and jurisdictions within one mile, and at trailheads and access roads leading to an area with piles proposed for burning. For burns in excess of 50 acres, noticing shall extend to a larger region as determined appropriate by Midpen. The public notification shall include current contact numbers to the appropriate burn coordinator.	Midpen	Midpen	Prescribed burn projects in the NCCAB and SFBAAB; Pile burning in NCCAB.	**Before Activity:** (1) Choose vegetation types with fewer emissions when other considerations are equal, (2) reduce the fuel loads, (3) schedule burn prior to new vegetation growth, and (4) conduct noticing. **During Activity:** (1) Mosaic burn, (2) burn when fuels have appropriate moisture content, and (3) limit pile burns conducted in any one day in NCCAB. **After Activity:** N/A	
MM Air Quality-3: Asbestos Management Prior to conducting any activities requiring manual soil-disturbing activities (e.g., pulling of vegetation or trenching), use of mechanical equipment (e.g., skid steer loader or backhoe), or off-road access to a work site, consult the map created using GIS that shows where serpentine soils and rock formations are located. If the work site or temporary access route passes through an area with serpentine soils or rock formations, implement the asbestos-management measures (below), developed based on CARB Asbestos Airborne Toxic Control Measures developed for construction and grading operations. Asbestos Management Measures: • Areas known to have asbestos shall be watered during ground-disturbing activities (e.g., pulling of medium-to-large vegetation, digging large holes for planting) to ensure that the soil remains moist during the extent of the activity. • Avoid or minimize the tracking of dust into vehicles. • Do not use compressed air for cleaning your vehicles after your visit. Use a wet rag to clean the interior. • All vehicle speeds on unpaved roads shall be limited to 15 mph, in accordance with Midpen policy (LU Regulations Section 500.1; MO Manual 07.005). • When mowing in serpentine soils, the mower head shall be set at least 6 inches above the ground to minimize asbestos dust generation. If when mowing, dust is seen from the mower pluming more than 4 feet above the ground surface, the mower shall be adjusted to the minimum height needed to avoid generating dust plumes.	Midpen and/or Contractor	Midpen	Areas with serpentine soils or rock formations where activities could occur.	**Before Activity:** Water areas with serpentine soils or exposed rock formations. **During Activity:** (1) Water exposed surfaces twice a day, (2) limit vehicle speeds, and (3) raise mower head to minimize dust. **After Activity:** N/A	
MM Air Quality-4: Midpen Employee Protection from Prescribed Burn Air Pollutants Midpen shall require that prescribed burns on Midpen lands are managed to reduce Midpen employee exposure to CO concentrations and other air pollutants through implementation of the following measures: • Use real-time CO monitors. • Train workers to be aware of smoke hazards associated with prescribed and pile burns. • Rotate personnel out of heavy smoke areas and routinely monitor for smoke exposure during burn events. • Avoid burning heavy fuel loads, such as large logs, on the ground to avoid additional mop up. • Strategically place firefighters and fire lines where smoke exposure is less. • N95 or N100 dust masks, or bandanna shall be available for voluntary use and must be used when recommended by the Burn Boss.		Midpen	Prescribed burn locations.	**Before Activity:** Purchase real time CO monitors. **During Activity:** (1) Provide real-time CO monitors to firefighters, (2) rotate firefighters out of heavy smoke areas, and (3) avoid burning of areas with heavy fuel loads. **After Activity:** N/A	

MITIGATION, MONITORING, AND REPORTING PROGRAM

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
Biological Resources					
MM Biology-1: Training, Monitoring, and Reporting **Monitoring** • The biological monitor(s) or qualified biologist(s) shall have the authority to stop Program activities to avoid take or impacts to special-status species or protected biological resources; in the event of unforeseen circumstances (e.g., unanticipated impacts are occurring); or if Program personnel are not complying with regulatory permit conditions and the BMPs listed herein. The biological monitor or qualified biologist shall possess the necessary agency approvals or permits required for involvement in Program activities. - A **biological monitor** is an individual who has a minimum of 2 years academic and 1 year professional experience in biological sciences and related resource management activities, is able to identify species that may be present within the work area, and is familiar with the habits and behavior of those species. - A **qualified biologist/botanist** is an individual who has a minimum of a 4-year academic degree in biological sciences or related resource management activities, with a minimum of two survey seasons years (e.g., two seasons during the blooming season of sensitive plants) conducting surveys for each species that may be present within the work area. - A **professional biologist/botanist** is an individual who has a minimum of 5 years of academic training in biological sciences or related studies and 3 or more years of professional experience conducting protocol-level wildlife and/or florist field surveys. - A **Midpen-approved biologist/botanist** is an outside consultant who has been approved by Midpen either by a professional biologist/botanist, Resource Advisor or other appropriate individual, to conduct biological monitoring and surveying activities. This individual can be any one of the three categories of biologist/botanist described above. - A **Resource Advisor** is an individual who provides professional knowledge and expertise for the protection of resources (e.g., biological and cultural resources), within an emergency incident environment. • The qualified biologist or biological monitor shall conduct on-site monitoring of Program activities that have the potential to impact sensitive biological resources. The monitoring requirements (e.g., frequency and duration) shall depend on the specific activity(ies) being performed and the ecological sensitivity of the site (e.g., the potential for soil erosion or occurrence of special-status wildlife). Some activities shall warrant full-time monitoring by one or more biologists and/or biological monitors; whereas weekly site inspections may be sufficient for other activities. At a minimum, monitoring shall be conducted frequently enough to ensure compliance with permit conditions and BMPs. The monitor shall maintain a log that documents: (a) the monitoring dates, (b) areas and activities monitored, (c) compliance with permit conditions and BMPs, (d) any remedial actions that were taken (or are needed). • Post-activity monitoring shall also occur, with the scope and timing dependent on the potential for risks to biological resources. The purpose of monitoring is to ensure that special-status plant species and sensitive communities were avoided and are not experiencing negative indirect impacts from activities. If negative impacts are observed or are potentially occurring, restoration measures shall be implemented, and modifications made to future activities to avoid similar impacts. **Pre-Activity General Survey and Flagging** A qualified biologist or biological monitor working under a qualified biologist shall survey all selected work areas shortly before work to assess general conditions and determine environmental considerations as required by IPMP BMPs 21 and 25. Prior to Program activities, the biologist or biological monitor shall use flagging (or other methods) to clearly delineate the work area and any areas that shall be avoided (e.g., sensitive communities, habitat for special-status species). **Reporting** Information on new localities or sightings for special-status species shall be reported to the Sacramento USFWS Office and the California Natural Diversity Database (CNDDB) annually. Information on any incidental capture, injury, or mortality of special-status species shall be immediately reported within 3 working days of their discovery or in accordance with the federal and State permit conditions. The data shall also be logged in Midpen's electronic inventory system identified in IPMP BMP 25. **Training** • Prior to commencing a Program activity, all personnel shall attend a worker environmental awareness training program conducted or prepared by the qualified biologist or biological monitor working under a Midpen-approved biologist as required by IPMP BMP 21.	Midpen and Contractor	Midpen	All Midpen lands.	**Before Activity:** (1) Survey all selected work areas and (2) conduct worker environmental awareness training program. **During Activity:** (1) Conduct on-site monitoring, (2) report information on any incidental capture, injury, or mortality of special-status species, (3) temporarily stop any work that may harm special-status species, and (4) inspect vehicles, equipment, and fencing daily. **After Activity:** Conduct post-activity monitoring.	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
• The worker environmental awareness training will include a brief review of the life history, field identification, and habitat requirements of each special-status species that could potentially be present on-site, their known or probable habitat types and locations, potential fines for violations, avoidance measures, and necessary actions if special-status species or sensitive natural communities are encountered, as required by IPMP BMP 21. In addition, the training shall include information on: - All BMPs, regulatory permit conditions, exclusion areas, and other work restrictions. - Color coding for flagging used to demarcate work areas, staging areas, skid trails, watercourses, and exclusion zones (e.g., around special-status plants and other sensitive biological resources). - The identification and reproductive biology of invasive plants and animals. - *Phytopthora ramorum* and other pathogen avoidance. **General Wildlife Protection Measures** • Vehicles traveling to and from the work areas off of established roads and trails, in sensitive plant or wildlife habitat, must travel slowly (5 mph) and be preceded by a monitor to ensure that wildlife shall not be run over by the passing vehicle. Vehicle monitors do not need to be trained biologists. • Vehicle monitors shall check for any reptiles, amphibians, or other animals under vehicles and equipment parked for more than 30 minutes. • Some individual live, dead, or dying trees shall be retained as snags where recommended by the qualified biologist and biological monitor and where leaving the tree would not increase fire hazards or be a safety concern. • Qualified biologists/biological monitors are required to temporarily stop any work that they believe may harm special-status species. Work shall not resume until a satisfactory method is agreed upon to minimize or avoid take of the species. • Qualified biologists/biological monitors may require staging areas or stockpiled equipment/materials to be fenced with USFWS and/or CDFW-approved exclusion fencing if there is potential for special-status species to enter the areas and become entrapped, and routine inspection of the area is not adequate to ensure that species are not present. Fencing shall be inspected by a qualified biologist/biological monitor and maintained daily as needed to ensure its proper function in excluding wildlife. Large-scale fencing around entire vegetation management areas is discouraged due to the habitat disruption associated with fence installation and removal.					
MM Biology-2: Special-Status Plants **Pre-Activity Special-Status Plant Survey** As required by IPMP BMP 25, a biological monitor or qualified biologist shall survey the work site to determine the potential presence of special-status plants (as defined under Section 4.4.2 in the Program EIR) and document any observations. Surveys shall be conducted at the time of year when plants will be both evident and identifiable and using a standard protocol relevant at the time of the survey, such as the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW, 2018). The abundance and spatial distribution of all special-status plants and sensitive natural communities detected during the surveys shall be recorded with a GPS unit and entered online into the CalFlora and Midpen's GIS databases. This information shall also be submitted to the CNDDB, per MM Biology-1. If any special-status plants are found to occur in the activity footprint, the biologist/botanist shall evaluate the potential level of impacts the activity could have on the plant species, either an individual or population, based on its biology and the nature of the activity (no impact, low impact, or moderate/high impact). Activities with no or low impact can proceed. If an activity could have a moderate or high impact (e.g., anticipated mortality) Midpen shall consult with CDFW and the appropriate avoidance or minimization measures would be implemented, depending on the species' rank, physiology, and habitat requirements, as described below. **Species to Avoid (Unless Population Could Benefit from Program Activity, such as Prescribed Burning)** Program activities shall avoid impacts to State or federally listed plants that are known to occur or have the potential to occur on Midpen lands: • Ben Lomond spineflower • Butano Ridge cypress • California seablite • San Francisco popcornflower • San Mateo thorn-mint • San Mateo woolly sunflower	Midpen biological monitor or qualified biologist and Contractor	Midpen	Any area where Program activities occur near special-status plant species.	**Before Activity:** Survey the work site to determine the potential presence of special status plants and document and report accordingly. **During Activity:** (1) Avoid impacts to State or federally listed plants, (2) implement botanist's recommendations for spatial buffers or other management actions, and (3) implement general avoidance and minimization measures. **After Activity:** Attempt to salvage any special-status plants that are permanently impacted by a Program activity.	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification

- Coyote ceanothus
- Crystal Springs fountain thistle
- Dudley's lousewort
- Marin western flax
- Metcalf Canyon jewelflower
- Monterey spineflower
- Pacific Grove clover
- Robust spineflower
- Rock sanicle
- Santa Clara Valley dudleya
- Santa Cruz cypress
- Santa Cruz tarplant
- Santa Cruz wallflower
- Scotts Valley polygonum
- Scotts Valley spineflower
- Two-fork clover
- White-rayed pentachaeta

In addition, Program activities shall avoid impacts to the following species that (a) have very specific habitat requirements that are hard to replicate at a mitigation site; (b) are difficult to transplant or propagate; or (c) have insufficient data on the ability to successfully transplant, relocate, or reintroduce the taxa:

- Anderson's manzanita
- Kings Mountain manzanita
- Clustered lady's-slipper
- Mountain lady's-slipper
- Loma Prieta hoita
- Arcuate bush-mallow
- Most beautiful jewelflower

Activities that could have a moderate or high impact on these species shall not occur within an appropriate buffer (as determined by a qualified biologist/botanist or biological monitor working under a qualified biologist) of any individuals or populations identified. Disclines or firefighting infrastructure shall be relocated to avoid any populations of these species.

Prescribed herbivory and prescribed burning shall be allowed in the habitats for these species if, in the professional opinion of a qualified biologist/botanist or biological monitor working under a qualified biologist, the activity shall provide a long-term benefit to the plant (e.g., by eliminating non-native plants).

Minimization of Impacts for All Other Special-Status Species

Midpen shall implement the following approach for all other special-status plant species that have been detected, or that are detected in the Program area during the pre-activity surveys conducted per MM Biology-1 (adding specificity to IPMP BMP 21, which requires developing site-specific measures):

- A qualified biologist/botanist or biological monitor working under a qualified biologist shall recommend spatial buffers or other management actions. The buffer size needed to protect a special-status plant from adverse edge effects (indirect impacts) is dependent on the specific species, threats to the species, existing disturbances, and the habitat's permeability to those threats (CBI 2000). Midpen shall implement the botanist's recommendations. Impacts to a special-status plant shall only occur if it is the botanist's professional opinion that the impact shall provide a long-term benefit to the plant (e.g., by eliminating non-native plants or another threat to the species). If Midpen is unable to implement the botanist's recommendations, or if there is uncertainty regarding the effects of a Program activity on the special-status plant population, Midpen shall assess subsequent effects on the plant population through post-activity monitoring. If the monitoring indicates the Program activity has negatively impacted the plant population, the compensatory mitigation terms of MM Biology-3 shall apply. If the monitoring indicates the effects were positive or neutral, no additional mitigation is required.
- If Program activities are proposed to be conducted in habitat for a special-status plant, the activities shall be conducted during the phenological stage least sensitive to disturbance, based on guidance from the botanist.
- If Program activities are proposed to be conducted in habitat for a special-status plant, and the work must be conducted when the plant is sensitive to disturbance (e.g., during the growing season), Midpen shall assume the plant could be permanently impacted and shall either:
  - 1a. Monitor the response of the plant post-construction. If the study indicates the Program activity has negatively impacted the plant population, the terms of MM Biology-3 shall apply.

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
- 1b. Attempt to salvage any special-status plants that are permanently impacted by a Program activity (e.g., plants within a proposed discline). Salvaged plants (and seeds) shall be used for the compensatory mitigation required under MM Biology-3, and comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible. Any supplemental plants (or seeds) needed for a mitigation project, site rehabilitation, or other application shall be derived from locally appropriate genetic material and nurseries that comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible; or - 2. Provide compensatory mitigation in accordance with the terms of MM Biology-3. **General Minimization and Avoidance Measures** Burn piles shall not be located within 50 feet of a special-status plant except those species that a qualified biologist/botanist or biological monitor working under a qualified biologist determines shall benefit from burning (e.g., Kings Mountain manzanita). Propane flaming shall not be conducted within the vicinity of special-status plants that could be accidentally damaged by the flaming activities. Vegetative debris shall not be placed on top of special-status plants, unless the biologist/botanist determines this is acceptable.					
MM Biology-3: Compensatory Mitigation for Impacts to Special-Status Plants Midpen shall provide compensatory mitigation for any special-status plant population that is permanently and negatively impacted by Program activities (i.e., could not be avoided or benefited through activities and subsequent monitoring determines an adverse effect to the population where a decline in the population is attributable to the Program activities, per MM Biology-2). Compensatory mitigation may be accomplished through habitat preservation, creation, restoration, or enhancement as determined appropriate by Midpen's qualified biologist/botanist or biological monitor working under a qualified biologist, in consultation with CDFW. All compensatory mitigation projects shall include a mitigation plan outlining the strategy, and the plan must be approved by CDFW, including identification of the success thresholds established depending on the population and site conditions. The compensation ratio for planting shall be no less than 3:1 (plants at mitigation site/plants at impact site). Under some circumstances a higher ratio may be needed, which shall be determined by Midpen's qualified biologist/botanist or biological monitor working under a qualified biologist, in consultation with CDFW. If habitat enhancement is selected, the compensation ratio shall be no less than 6:1. If possible, compensatory mitigation shall occur on lands under Midpen's control. Mitigation sites on Midpen land shall include provisions for protecting them from impacts caused by other projects or programs (existing and future). Compensatory mitigation shall not be allowed on lands outside of Midpen's control unless those lands have a legally enforceable mechanism that ensures they shall be protected and managed in perpetuity for the benefit of the target species (i.e., special-status plant requiring mitigation). Midpen shall hold responsibility for the success of mitigation projects conducted on lands outside of its control, unless mitigation is accomplished through an approved program (i.e., mitigation bank or in-lieu fee program). Midpen shall apply the monitoring methods outlined in the Monitoring Plan of the Program to monitor the success of compensatory mitigation projects. To account for natural variability in the size of plant populations, Midpen shall also monitor a nearby reference population. Midpen shall prepare annual monitoring reports that document the monitoring methods and results. Monitoring reports shall be submitted to CDFW. Monitoring of compensatory planting shall be conducted for at least 5 years. If after 3 years, monitoring has determined that the planting success standards are met, the report shall make this determination and monitoring may cease. Monitoring of compensatory habitat enhancement shall be conducted for at least 1 year, after which time if the success standards are met, no further monitoring is required. A mitigation project shall be considered successful if during the monitoring period, the qualified botanist or biological monitor working under a qualified biologist, determines the success threshold has been achieved. The success threshold may be adjusted downward commensurate with any decline observed at the reference population. For example, if a special-status species is detected in a planned work area, and Midpen is unable to reconfigure the treatment or treatment method to avoid impacts to the species, Midpen shall count the number of plants in the work area and at a nearby reference population. The compensation requirement shall be based on the number of plants impacted by the treatment, whereas the number of plants at the reference site shall serve as the baseline for evaluating natural fluctuations in the population. For example, if 100 plants of a given special-status species are located in the work area, the compensation requirement is 300 plants. However, if during the final 2 years of mitigation monitoring the reference population has 20 percent less plants than the baseline value, the threshold for success at the mitigation site shall also be 20 percent less (240 plants, assuming the success threshold was set to 300 plants).	Midpen	Midpen	Any area where Program activities permanently affect any special-status plant population.	**Before Activity:** Determine appropriate compensation ratio. **During Activity:** Select habitat preservation, creation, restoration, or enhancement for compensatory mitigation project. **After Activity:** Monitor the success of compensatory mitigation projects for no less than 5 years.	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
To facilitate the likelihood of success, Midpen shall: • Ensure materials used for plant establishment (e.g., seed sources, container plantings) are sourced from genetically appropriate material and comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible. Container plants shall only be sourced from a nursery that complies with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible. • Maintain less than 10 percent cover of invasive plants at the mitigation site until the target species has successfully established. Thereafter, Midpen shall conduct invasive plant removal on an as-needed basis. • Implement measures (e.g., close restoration areas, install signage) to restrict public access within mitigation zones, at least until the target species has successfully established. • Conduct visual inspections of the mitigation site to identify any major problems (e.g., unauthorized trespass) requiring remedial actions. The frequency of visual inspections shall be commensurate with threats to the ecological integrity of the site. The site shall be inspected annually until the success criteria of the permitting agencies (e.g., CDFW) are met, after which the site shall be monitored in accordance with Midpen's Monitoring Plan for the WFRP.					
MM Biology-4: Invasive Plants and Soil Pathogens **General Invasive Plant Measures** In addition to Midpen's standard invasive species practices under the IPMP (i.e., IPMP BMPs 11 through 18), Midpen shall implement the following invasive plant measures: • Data on populations of invasive weed species in the work area and along access roads shall be collected and reviewed prior to implementation of the Program activity. Data shall include the distribution, abundance, and seral stage of invasive weed species. Pre-activity general surveys conducted according to MM Biology-1 shall be designed to detect all weeds on the CDFA noxious weed list, and Cal-IPC species with a rank of High and Moderate. • Invasive weed species that occur within or immediately adjacent to the boundaries of proposed treatment areas shall be removed prior to the treatment—unless the treatment has been specifically designed to control or eliminate those species. For example, yellow star thistle removal shall not be required for a grazing treatment designed to control yellow star thistle. Midpen shall identify the appropriate disposal location for weeds that are removed. In determining the disposal location, Midpen shall assess the potential for spread of plant pathogens that might be present. • Schedule activities to maximize the effectiveness of control efforts and minimize introduction and spread of invasive plants (e.g., install and maintain fuelbreaks, disclines, and other VMAs before non-native plants set seeds). • Implement vegetation methods favorable to native plants. **Prescribed Fire and Planning Invasive Plant Measures** • A qualified biologist/botanist or biological monitor working under a qualified biologist shall evaluate the likely effects of a prescribed burn on invasive species in the proposed burn area based on the species that are known to occur in the area or that are found during the pre-activity survey (MM Biology-1). If the burn might promote spread of an invasive species, Midpen shall implement measures (e.g., manual treatments) to proactively reduce the threat or invasive species spread following the burn. • A qualified biologist/botanist or biological monitor working under a qualified biologist shall assess the effects of the burn to determine whether revegetation is needed in any areas to speed recovery of the desired plant community. • A qualified biologist/botanist or biological monitor working under a qualified biologist shall monitor vegetation recruitment on control lines. If vegetation recruitment is not on a trajectory for restoration of the impacted community, Midpen shall implement remedial measures such as planting or seeding. • An interdisciplinary team shall determine when activities (including conservation grazing and public access) may resume in burned areas. The team shall include natural resource staff knowledgeable about invasive plants. **General SOD and Soil *Phytopthoras* Measures**	Midpen biological monitor or qualified biologist and Contractor	Midpen	All Midpen lands.	**Before Activity:** (1) Collect data on populations of invasive weed species in the work area and along access roads and, (2) evaluate the likely effects of a prescribed burn on invasive species in the proposed burn area. **During Activity:** (1) Remove invasive weed species that occur within or immediately adjacent to the boundaries of proposed treatment areas, (2) clean vehicles, equipment, and boots prior to entering the work area, (3) assess the effects of a prescribed burn to determine whether revegetation is needed in any areas to speed recovery of the desired plant community, (4) if a prescribed burn might promote spread of an invasive species, implement measures to proactively reduce the threat that the plant shall spread following the burn, and (5) implement the BMPs recommended by the California Oak Mortality Task Force and the Phytophthoras in Native Plant Habitats Work Group. **After Activity:** Monitor vegetation recruitment on disturbance lines	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
Midpen shall implement the latest BMPs recommended by the California Oak Mortality Task Force (2020) and the Phytophthoras in Native Plant Habitats Work Group, as determined appropriate by the qualified biologist/botanist or biological monitor working under a qualified biologist.				for adequate restoration of the impacted community, if applicable.	
MM Biology-5: Invasive Plant Detection and Response **Early Detection and Rapid Response** Midpen shall conduct routine monitoring of work areas (e.g., VMAs, prescribed burn areas) in accordance with the Early Detection Rapid Response (EDRR) Protocol and the IPMP (generally every 3 to 5 years). If invasive or potentially invasive species are detected, Midpen shall conduct rapid response dependent upon the circumstances and according to the EDRR Protocol. **Baseline Data and Reference Sites** A Midpen-approved biologist/botanist shall select a reference site for each sensitive natural community affected by the Program. The reference site shall be on Midpen lands that are not directly or indirectly affected by Program activities. Prior to Program impacts in an area, an initial assessment shall be conducted to select a reference site that possess characteristics similar to the impact sites. If a suitable reference site does not exist and when feasible, Midpen shall collect 3 years of vegetation sampling data at the proposed impact site. Quadrat sampling shall occur for up to 5 years at a reference site, if located. This pre-impact or reference site data shall serve as the baseline for comparison with post-impact data. Sampling shall be conducted within quadrats at both the impacted site and reference sites. Quadrat sizes vary depending upon habitat type and shall be determined by the qualified botanist or biological monitor working under a qualified biologist, but typical sizes are 0.5 to 1 square meter for short grassland, 2 square meters for shrublands, and up to 20 square meters for woodlands. The qualified botanist or biological monitor working under a qualified biologist shall conduct power analysis to estimate the minimum number of quadrats needed to determine a statistically significant difference between the impact site and reference sites (at a significance level of 0.05 and a power level of 0.80). Quadrat sampling locations shall be randomly selected through use of a random number generator in GIS. Within each quadrat, absolute cover of plants shall be visually estimated and recorded for the quadrat as a whole and for each individual plant species using the California Native Plant Society's (CNPS's) method for estimating cover values (CNPS 2020). The CNPS method for estimating cover values uses a "bird's eye view," looking from above and estimating cover for the living plants only. Litter and duff shall not be included in these estimates, and the porosity of the vegetation shall be taken into consideration when estimating percent cover. Percent cover diagrams shall be used to facilitate cover estimates. All invasive species that are incidentally detected during sampling (but outside of the quadrats) shall be documented. Cover data shall be entered into a spreadsheet for analysis. Total cover, percent cover contributed by natives, total cover contributed by non-natives, and cover contributed by invasive weed species shall be calculated from these data. **Success Criteria** • Eradication of invasive or potentially invasive species with a California Invasive Plant Council high rating or designated as noxious that were not detected during the baseline surveys. The target species is considered eradicated after 5 consecutive years with no observations of the target species. • Within 5 years of the impact, cover of non-native species is less than or equal to cover of non-native species at the reference sites.	Midpen biological monitor or qualified biologist	Midpen	Midpen lands.	**Before Activity:** Select pre-impact or reference site data to serve as the baseline for comparison with post-impact data. **During Activity:** Implement EDRR Protocol. **After Activity:** Conduct monitoring according to the EDRR Protocol until success criteria is achieved.	
MM Biology-6: San Francisco Garter Snake Protection Measures • All practicable measures shall be taken to avoid killing or injuring San Francisco garter snake during Program activities. Any project-related, human-caused injuries to San Francisco garter snake shall be immediately reported to CDFW and USFWS. • Within riparian habitat or Waters of the State and/or U.S. and one (1) mile of a known San Francisco garter snake occurrence, Program activities shall be conducted consistent with permit terms and conditions of the current versions of the USFWS Recovery Permit Number: TE225974-2 and CDFW Memorandum of Understanding "Research and Recovery of San Francisco Garter Snake and California Tiger Salamander". • In suitable habitat where San Francisco garter snake has not been documented: a. **Biological Awareness Training.** A biological awareness training shall be provided in accordance with MM Biology-1. A biological monitor shall remain on-site in sensitive areas identified during the pre-survey. If at any time a San Francisco garter	Midpen biological monitor or qualified biologist and Contractor	Midpen	Where Program activities are proposed within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known San Francisco garter snake occurrence.	**Before Activity:** (1) Provide a biological awareness training in accordance with MM Biology-1, (2) identify acceptable locations where San Francisco garter snake may be relocated if these species are encountered within a work area, (3) for all work occurring within 50 feet of ponds, streams, and wetlands suitable for San Francisco garter snake,	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
snake is observed, work shall stop immediately until a qualified biological monitor is contacted. Biological monitor(s) and/or qualified biologist(s) shall remain on the work area while initial ground disturbing activities are being conducted, after which biological monitor(s) and/or qualified biologists shall be on-call while Program activities are being conducted at these sites. b. **Vegetation Removal by Mechanized Equipment**. Mowing in areas of San Francisco garter snake habitat shall be conducted outside the peak San Francisco garter snake activity season as determined by a qualified biologist or biological monitor working under a qualified biologist (work typically occurs late October through mid-March or mid-June to end of August). The qualified biologist or biological monitor working under a qualified biologist shall precede the mowing equipment and inspect vegetation for San Francisco garter snake individuals. The mower head shall be kept at 6 inches above ground. Prior to use of a masticator or other heavy equipment in discrete areas with San Francisco garter snake habitat, vegetation shall be cut down to 3 inches by hand tools (weedwhacker, etc.). Once the ground is visible, a visual survey for San Francisco garter snake shall be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a San Francisco garter snake is observed, all activities shall cease and Midpen shall coordinate with USFWS and CDFW immediately. Prior to the start of work, areas shall be identified by the biological monitor and approved by USFWS and CDFW as acceptable locations to which San Francisco garter snake may be relocated if these species are encountered within a work area. Relocation areas shall be a minimum of 100 feet from the boundary of any work area and shall not include staging areas or roads. No San Francisco garter snake shall be removed from the site or maintained in captivity overnight without prior notification and written approval by the USFWS and CDFW unless the animal is in need of emergency medical assistance. Medical assistance shall be provided to injured animals by a certified wildlife veterinarian familiar with amphibian and reptile care. When transporting individual San Francisco garter snake, precautions shall be taken to ensure that the animals are not over-stressed and are maintained in safety. Such measures include: keeping animals in a cool, dark, and safe location (snake bag for San Francisco garter snake), providing adequate hydration, maintaining a stable cool temperature to avoid over-heating, keeping animals isolated to prevent them from harming one another, and ensuring holding tanks or bags are kept clean to prevent the spread of any diseases. c. **No Stockpiling of Vegetation.** Viable vegetation removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on-site for erosion control or slash and not be moved or disturbed. d. For all work occurring within 50 feet of ponds, streams, and wetlands suitable for San Francisco garter snake, visual surveys shall be conducted by walking at least a 50-foot buffer area around the pond in an attempt to locate individual San Francisco garter snake no more than 24 hours prior to conducting work. A trained and permitted professional biologist shall capture, transfer, and release in a safe area any San Francisco garter snake deemed to be in danger of being harmed by Program activities. If an San Francisco garter snake is located during the pre-treatment surveys but escapes capture, the area where the snake was lost shall be marked by flag and a 50-foot (15 meter) radius shall be actively patrolled during the work. If necessary, individual San Francisco garter snake may be held in captivity in a pillowcase for less than 24 hours and may later be released near the point of capture after the work has been completed. After the pre-treatment survey, an avoidance strategy shall be devised and presented to all individuals involved in Program activities prior to the start of work. The number of San Francisco garter snake encountered and transferred to safe areas or held in captivity during treatment shall be reported to USFWS, and each individual snake shall be photographed for use in identification.				conduct visual surveys by walking at least a 50-foot buffer area around the pond in an attempt to locate individual San Francisco garter snake no more than 24 hours prior to conducting work, and (4) devise an avoidance strategy and present it to all individuals involved in Program activities prior to the start of work. **During Activity:** (1) Stop work immediately if at any time a San Francisco garter snake is observed, (2) conduct mowing in areas of San Francisco garter snake habitat outside the peak San Francisco garter snake activity season, (3) conduct a visual survey for San Francisco garter snake after vegetation is cut down to 3 inches by hand tools, (4) continue vegetation removal by mechanized equipment very slowly if no sensitive species are found in the area, and (5) do not stockpile vegetation. **After Activity:** N/A	
MM Biology-7: California Red-Legged Frog Protection Measures **Handling of California Red-legged Frog** Handling of California red-legged frog will be done by permitted and qualified biologists or biological monitor working under a qualified biologist in an expedient manner with minimal harm to the individuals being handled. Handling of California red-legged frog will be done with wet hands. The hands and arms of all workers handling California red-legged frog will be free of lotions, creams, sunscreen, oils, ointment, insect repellent, or any other material that may harm California red-legged frog. Larval California red-legged frog will not be handled out of the water for longer than 30 seconds unless rewetted and will not be retained for longer than 5 minutes for processing. If	Midpen biological monitor or qualified biologist and Contractor	Midpen	Where Program activities are proposed within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known	**Before Activity:** (1) Provide a biological awareness training in accordance with MM Biology-1, (2) identify acceptable locations where California red-legged frog may be relocated if encountered within a work area, (3) conduct a focused survey for California red-	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
captured California red-legged frog exhibit signs of distress (e.g., lack of response to stimuli or erratic behavior), they will be immediately released at the point of capture. All captured California red-legged frog will be released at the point of capture unless that location puts them in imminent danger, in which case they will be placed in a nearby refugium sufficient to protect them. The number of California red-legged frog to be captured is no more than 30 adults per habitat location (defined as the area that specific work is conducted such as a pond site or OSP) per year. In the course of monitoring associated with the activities, if California red-legged frog egg masses are observed in ponds or wetted areas that are going to dry naturally before tadpoles develop (as determined by a qualified biologist or biological monitor working under a qualified biologist), emergency salvage of egg masses by the qualified biologist or biological monitor working under a qualified biologist is permitted to relocate egg masses into deeper waters that will not be affected by the proposed activities. USFWS shall be notified of the emergency salvage per the terms of the recovery permit. Amplexing pairs of California red-legged frog will not be captured, handled, or disturbed. The permittee will disinfect sampling and field gear to minimize the spread of pathogens as follows: 1. Sampling and field gear will be disinfected after exiting one aquatic habitat and before entering the next aquatic habitat, unless the waters are hydrologically connected to one another. 2. All organic matter will be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water or potentially contaminated sediments. These items will then be rinsed with clean water before leaving each study site. 3. Boots, nets, traps, hands, etc., will be scrubbed with a bleach solution (0.5 to 1.0 cup per 1.0 gallon of water), Quat-128™ (1:60), or a 3 to 6 percent sodium hypochlorite solution and thoroughly rinsed clean with water between study sites. Equipment will be rinsed clean with water between study sites. Cleaning equipment in the immediate vicinity of aquatic habitats will be avoided (e.g., clean in an area at least 100 feet from aquatic features). Care will be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat. 4. Used cleaning materials (liquids, etc.) will be disposed of safely, and if necessary, taken back to the lab for proper disposal. Used disposable gloves will be retained for safe disposal in sealed bags. California red-legged frog will not be removed from the wild and held in captivity for any reason unless prior written approval is acquired by the appropriate USFWS Office or unless the severity of an injury to the California red-legged frog obviates immediate care. Animals will be transported according to accepted methods, in moist cloth bags or in terrarium with moisture gel or non-cellulose sponge to minimize desiccation. **Protocols for California Red-legged Frog Depending Upon Location of Activity** For activities conducted within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known California red-legged frog occurrence: • Prior to and within 48 hours of the planned start of Program activities, a focused survey for California red-legged frog using an agency approved protocol will be conducted by a qualified biologist or biological monitor working under a qualified biologist to determine if they are in the area. If California red-legged frog are found, Midpen will coordinate with CDFW and USFWS immediately to determine the correct course of action and Program activities at that location will not commence until after May 30 or authorized by CDFW and USFWS. • If California red-legged frog are found, biological monitor(s) and/or qualified biologists will be on site while Program activities are being conducted. Midpen will implement the following measures: a. **Inspection of Parked Vehicles:** Any vehicle parked on-site for more than 15 minutes will be inspected before it is moved to ensure that California red-legged frog has not moved under the vehicle. Any parking areas must be checked in advance by the biological monitor or qualified biologist. b. **Vegetation Removal by Mechanized Equipment at California Red-legged Frog Sensitive Sites (areas within or adjacent to wetted aquatic sites):** For vegetation removal on berms or other wetted sites with known California red-legged frog observations, vegetation will be cut down to 3 inches by hand tools (weedwhacker, etc.). Once the ground is visible, a visual survey for California red-legged frog will be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mowing or mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a California red-legged frog is observed that is in harm's way, all activities shall cease and Midpen will notify CDFW and USFWS immediately or the			California red-legged frog occurrence.	legged frog using an agency approved protocol prior to and within 48 hours of the planned start of Program activities, (4) for all work occurring within 50 feet of ponds, streams, and wetlands suitable for California red-legged frog, conduct visual surveys by walking at least a 50-foot buffer area around the pond in an attempt to locate individual California red-legged frog no more than 24 hours prior to conducting work, (5) devise an avoidance strategy and present it to all individuals involved in Program activities prior to the start of work, and (6) inspect vegetation in work areas containing emergent vegetation for California red-legged frog eggs masses prior to Program activities and keep records. **During Activity:** (1) Stop work immediately if a California red-legged frog enters the work area, and (2) implement applicable measures for stop work and handling of individuals if California red-legged frog are found. **After Activity:** N/A	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification

California red-legged frog can be relocated by a person permitted by the USFWS and approved by CDFW for this project to handle California red-legged frog.

c. **Vegetation Disposal:** Vegetation removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on-site for erosion control or slash and not be moved or disturbed.

d. **No Stockpiled Soil:** Soil shall not be stockpiled on the ground unless it is on a paved surface or staging area where there are not burrows. Soils stockpiled for more than a single day near potential habitat should be covered or surrounded by exclusion fencing as directed by a qualified biologist to prevent burrowing animals from entering the stockpile.

e. **California Red-legged Frog Exclusion for Sediment Removal with Large Equipment:** California red-legged frog will be excluded from the project site prior to Program activities at sites involving the use of large equipment for sediment removal. USFWS and CDFW-approved exclusion fencing will be installed around the sediment removal site, staging areas, and any areas where fill may be dumped. After installation of the fence barrier, a biological monitor or qualified biologist will inspect the project work area, staging and stockpiling areas daily prior to the commencement of activities. If the biological monitor or qualified biologist determines that sensitive species are not within the work area, equipment or materials may be moved into the project site and Program activities may commence under the observation of the biological monitor.

For activities conducted in ponds:

- **Focused Surveys Prior to Work Activities.** Prior to and within 48 hours of the planned start of Program activities, a focused survey for California red-legged frog using agency approved protocol will be conducted by a qualified biologist or biological monitor working under a qualified biologist to determine if California red-legged frog is in the area. The pond will be sampled by a qualified biologist to ensure that all California red-legged frog from that pond are in the post metamorphic stage and will be minimally affected by draining the pond. If a California red-legged frog is located during the pre-treatment surveys but escapes capture, the area where the frog was lost will be marked by flag and a 50-foot (15 meter) radius will be actively patrolled during the work. If California red-legged frog are found, Midpen will coordinate with CDFW and USFWS immediately to determine the correct course of action and Program activities at that location will not commence until after May 30 or as authorized by CDFW and USFWS. After the pre-project survey, an avoidance strategy will be devised and presented to all individuals involved in the pond enhancement prior to starting any activities. The number of California red-legged frog encountered and transferred to safe areas or held in captivity by a permitted and qualified biologist during treatment will be reported to the Sacramento USFWS Office and CDFW.
- **Number of On-Site Biologists.** The minimum number of qualified biological monitors required at each pond site will be determined in advance by the qualified project biologist based on pond size, the amount and complexity of work to be performed, and the equipment to be used.
- **Travel Corridors.** Corridors for travel of vehicles and heavy machinery to the pond site will be established at least 24 hours in advance of the proposed work. Corridors that are not established, marked, and improved roads (paved or unpaved) require special consideration for use by any vehicle. During the use of these off-road corridors by vehicles and machinery, a monitor shall proceed directly before the vehicle or machinery to ensure all California red-legged frog and observable wildlife is cleared from the pathway of the oncoming vehicle. Monitors shall signal vehicles to stop if a California red-legged frog is on the pathway, and shall allow the animal to clear the pathway by its own direction. Any handling of the red-legged frog must only be done by a qualified permitted individual. Measures shall be taken to minimize the number of vehicles allowed on the property. All vehicles involved with the site-specific work that are not transported to the work site will be retained in a prearranged, marked parking area in a clearing as close to the main road as possible. At least one monitor will ensure wildlife is clear from the parking area while vehicles are arriving and leaving. All vehicles must stay on designated roads.
- **Seasonal Work Period in Ponds**. If California red-legged frog are found in the pond and water is present in the pond, sediment removal and berm or outfall repair activities shall be performed from August 15 to November 1. Midpen will coordinate with CDFW and USFWS prior to dredging or de-watering activities. Sediment will be removed from ponds by hand to the extent feasible. Sediment removal from ponds will occur as soon as the ponds are dry (if prior to August 15).
- **Vegetation Removal at Ponds**. If California red-legged frog is found, tule and emergent vegetation will be removed by hand when feasible. If mechanized equipment is used, one or more biological monitors or qualified biologists will be onsite monitoring the scoop

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
bucket while scooping and watching each load unload. Midpen will coordinate with CDFW and USFWS during the annual project notification process regarding anticipated mechanized equipment use for vegetation removal at ponds. In areas where egg masses are known, Midpen and contractor personnel will not enter the channel/pond to avoid dislodging egg masses. Trimming activities shall be performed from the banks, if possible. • **Inspection for Egg Masses**. In work areas containing emergent vegetation (e.g., tules, cattails), vegetation will be inspected for California red-legged frog eggs masses prior to Program activities. If work cannot be postponed, a buffer of vegetation at least 10 feet in diameter shall be left around any egg masses found. Midpen will keep a record of sites where egg masses are found and conduct vegetation removal at these sites prior to November 1 in subsequent years. If California red-legged frog is not found during the focused survey, or for activities conducted in suitable habitat where California red-legged frog has not been documented: • The biological monitor shall remain on-site if sensitive areas are identified during the presurvey. A biological awareness training shall be provided to all persons prior to beginning work. If at any time a California red-legged frog is observed, work shall stop immediately until a biological monitor is contacted. Biological monitor(s) and/or qualified biologists shall then remain be on the project site while Program activities are being conducted. If California red-legged frog is observed, the applicable California red-legged frog measures procedures described above will be followed. **General California Red-legged Frog Avoidance Measures** • If California red-legged frog enters the project area, all work shall stop until the animal leaves on its own. If a person is permitted by the USFWS and approved by CDFW for this specific project to handle California red-legged frog, they can handle and relocate California red-legged frog. Midpen will coordinate with CDFW and USFWS to develop site appropriate avoidance measures utilized for relocation. Prior to the start of work, areas will be identified by the biological monitor-in-charge as acceptable locations to which California red-legged frog may be relocated if these species are encountered within a work area. Relocation areas will be a minimum of 500 feet from the boundary of any work area and will not include staging areas or roads. No California red-legged frog will be removed from the site or maintained in captivity overnight without prior notification and written approval by the USFWS and CDFW unless the animal is in need of emergency medical assistance. Medical assistance will be provided to injured animals by a certified wildlife veterinarian familiar with amphibian and reptile care. When transporting individual California red-legged frog, safe handling precautions will be taken to ensure that the animals are not over-stressed. Safe handling measures include: keeping animals in a cool, dark, and safe location (terrarium for California red-legged frog), providing adequate hydration, maintaining a stable cool temperature to avoid over-heating, keeping animals isolated to prevent them from harming one another, and ensuring holding tanks or bags are kept clean to prevent the spread of any diseases. • All practicable measures shall be taken to avoid killing or injuring any life stage of California red-legged frog during habitat enhancement activities. • The biological monitor and/or qualified biologist shall have the authority to halt work activities that may affect California red-legged frog adults, tadpoles or egg masses until they can be moved out of harm's way. • Any project-related, human caused injuries to California red-legged frog will be immediately reported to CDFW and USFWS.					
MM Biology-8: Foothill Yellow-Legged Frog Protection Measures If foothill yellow-legged frog are found during the general survey conducted per MM Biology-1, biological monitor(s) and/or qualified biologists shall remain in the work area while Program activities are conducted. For activities conducted within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known foothill yellow-legged frog occurrence (within the last 20 years): • Information on foothill yellow-legged frog shall be included in the biological awareness training provided in accordance with MM Biology-1. • Any vehicle parked on-site for more than 15 minutes shall be inspected by the biological monitor or qualified biologist before it is moved to ensure that foothill yellow-legged frog have not moved under the vehicle. Any parking areas must be checked in advance by the biological monitor or qualified biologist. Vehicles shall not be moved if a frog is found, until the frog has moved out of harm's way as determined by the biological monitor or qualified biologist.	Midpen biological monitor or qualified biologist	Midpen	Where Program activities are proposed within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known foothill yellow-legged frog.	**Before Activity:** Provide a biological awareness training in accordance with MM Biology-1. **During Activity:** (1) Stop work immediately if at any time a foothill yellow-legged frog is observed and notify CDFW, (2) conduct a visual survey for foothill yellow-legged frog after vegetation is cute down to 3 inches by hand tools, (3) continue vegetation removal by mowing or	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
• For vegetation removal at sites with known foothill yellow-legged frog observations, vegetation shall be cut down to 3 inches by hand tools (weedwhacker, etc.). Once the ground is visible, a visual survey for foothill yellow-legged frog shall be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mowing or mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a foothill yellow-legged frog is observed, all activities shall cease and Midpen shall notify CDFW immediately. Foothill yellow-legged frog can only be relocated by an individual permitted by CDFW for this Program to handle foothill yellow-legged frog. • Vegetation that is to be removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on-site for erosion control or slash and not be moved or disturbed.				mechanized equipment very slowly if no sensitive species are found in the area, (4) do not stockpile vegetation, and (5) check all parking areas and under vehicles to ensure no presence of foothill yellow-legged frog and if any are found, do not move vehicles until the frog has moved out of harm's way. **After Activity:** N/A	
MM Biology-9: Western Pond Turtle Protection Measures Within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known western pond occurrence: • Information on western pond turtle shall be included in the biological awareness training provided in accordance with MM Biology-1. • A focused survey for western pond turtle and western pond turtle nests shall be conducted prior to and within 48 hours of the planned start of Program activities by a qualified biologist or biological monitor to determine if any individuals are in the area. • In the event western pond turtle are found in the work area, Midpen shall exercise measures to avoid direct injury to western pond turtle as well as avoid areas where they are observed to occur. • If a western pond turtle is observed during the Program activity, it shall be left alone to move out of the area on its own. If it does not move on its own, it can be relocated to a safe location at least 100 feet away from the work area. Relocation areas shall be of suitable habitat, on shallow banks with slow moving water and shall be far enough away so as not to be affected by Program activities. • If a western pond turtle nest was not found during focused surveys but is observed after initiation of Program activities and its habitat is determined to be unavoidable, all activities shall cease and Midpen shall coordinate with CDFW to develop site-appropriate avoidance and minimization measures.	Midpen biological monitor or qualified biologist	Midpen	Where Program activities are proposed within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known western pond turtle occurrence.	**Before Activity:** (1) Provide a biological awareness training in accordance with MM Biology-1, and (2) conduct a focused survey for western pond turtle and western pond turtle nests prior to and within 48 hours of the planned start of Program activities. **During Activity:** (1) Exercise measures to avoid direct injury to western pond turtle as well as avoid areas where they are observed to occur if western pond turtle are found in the work area, (2) leave western pond turtle alone to move out of the work area on their own if a western pond turtle is observed during activities, (3) relocate western pond turtle at least 100 feet distant from the work area if it does not move on its own, and (4) cease all activities is a western pond turtle nest is found and coordinate with CDFW to develop avoidance and minimization measures. **After Activity:** N/A	
MM Biology-10: California Giant Salamander, Santa Cruz Black Salamander, and Red-Bellied Newt Protection Measures • In primary suitable habitat where Santa Cruz black salamander, California giant salamander, or red-bellied newt were observed or are known to occur: • Information on these species shall be included in the biological awareness training provided in accordance with MM Biology-1. • A qualified biologist and biological monitor shall be available and on-call for the duration of Program activities.	Midpen biological monitor or qualified biologist and Contractor	Midpen	Where Program activities are proposed within suitable habitat for Santa Cruz black	**Before Activity:** (1) Provide a biological awareness training in accordance with MM Biology-1 and (2) conduct a pre-survey of the work area.	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
• A biological monitor shall be present on-site when working within 50 feet of wetted areas including stream channels, seeps, and springs. • For Santa Cruz black salamander only, a biological monitor is also required in areas of talus slopes or areas having human stacked rocks and other suitable materials acting as talus. • Work in wetted areas, talus slopes, or human stacked rocks or other suitable materials acting as artificial talus should be completed prior to July to avoid displacement of Santa Cruz black salamander females laying eggs and attending to clutches. • Dismantling of talus and human-stacked rocks and other suitable materials acting as artificial talus shall be avoided and minimized whenever possible. If removal is required to meet project objectives, these materials shall be dismantled by hand whenever possible. • Whenever possible, individual Santa Cruz black salamander, California giant salamander, and red-bellied newt shall be allowed to leave the area on their own. • Individual Santa Cruz black salamander, California giant salamander, or red-bellied newt (not with eggs) that are in harm's way or do not leave the work site on their own may be relocated by a qualified biologist or biological monitor to predetermined sites located outside of the work area but within the same subwatershed. • If heavy equipment is required to remove talus, human stacked rocks or other suitable materials acting as artificial talus, this shall be done in the presence of a qualified biological monitor. • If at any time, Santa Cruz black salamander, California giant salamander, or red-bellied newt eggs are found, the area shall be flagged for avoidance. If the area cannot be avoided to meet Program objectives, Midpen shall coordinate with CDFW to determine the best course of action. • In all other areas of suitable habitat for Santa Cruz black salamander, California giant salamander, and red-bellied newt: • Information on these species shall be included in the biological awareness training provided in accordance with MM Biology-1. • A qualified biologist and biological monitor shall be on-call with suitable availability to respond to calls for the duration of Program activities. • A pre-survey of the work area is required prior to starting work. If no Santa Cruz black salamander, California giant salamander, or red-bellied newt are observed, work may proceed. • If an individual Santa Cruz black salamander, California giant salamander, or red-bellied newt are observed at any time, all activities shall stop and the biologist and/or biological monitor shall be notified and the above measures shall be implemented.			salamander, California giant salamander, or red-bellied newt.	**During Activity:** (1) Ensure biological monitors are present on-site where applicable and (2) stop all activities, implement appropriate measures, and notify the biologist and/or biological monitor if an individual Santa Cruz black salamander, California giant salamander, or red-bellied newt are observed at any time. **After Activity:** N/A	
MM Biology-11: Nesting Bird Protection Measures (With the Exception of Marbled Murrelet) • Implement IPMP BMP 22 with the additional provisions listed here. • To avoid potential impacts to nesting birds, all Program activities shall be conducted between September 1 to February 14 unless a preconstruction nesting bird survey has been conducted by a qualified biologist or biological monitor. Work should be done during the non-breeding season whenever possible. The bird nesting seasons for smaller birds and raptors are defined per IPMP BMP 22 as follows: - March 15 to August 30 for smaller bird species such as passerines; and - February 15 to August 30 for raptors. - Earlier surveys may be needed for specific species such as owls, hummingbirds, herons and egrets and/or other species if nesting activity shifts due to climate change, as determined by a qualified biologist or biological monitor working under a qualified biologist. • If Program activities are scheduled during the nesting season of raptors and/or migratory birds, a focused survey for active nests of such birds shall be conducted by the qualified biologist or biological monitor within 15 days prior to the beginning of project-related activities. Surveys shall be conducted in all suitable habitat located at work areas and in staging and storage areas. The minimum survey radius for each bird type surrounding the work area shall be the following: - 250 feet for passerines; - 500 feet for other small raptors such as accipiters; - 1,000 feet for larger raptors such as buteos and eagles. - The bird survey methodology and the results of the survey shall be submitted to the CDFW prior to commencement of Program activities.	Midpen biological monitor or qualified biologist	Midpen	Where Program activities are scheduled during the nesting season of raptors and/or migratory birds.	**Before Activity:** (1) Conduct a focused survey for active nests of raptors and/or migratory birds within 15 days prior to the beginning of Program activities and submit results to CDFW, and (2) if active nests are found, designate active nest sites as "Ecologically Sensitive Areas" and comply with provisions specified. **During Activity:** (1) Complete work during the non-breeding season whenever possible, (2) conduct nest monitoring during Program activities, and (3) retain individual dead or dying trees to the maximum extent practicable. **After Activity:** N/A	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
• If an active nest (i.e., a nest having eggs or chicks present, or a nest that adult birds have staked a territory and are displaying, constructing a nest, or are repairing an old nest) is found and work cannot be postponed, Midpen shall designate active nest sites as "Ecologically Sensitive Areas" and protected (while occupied) during Program activities with the establishment of flagging or a fence barrier surrounding the nest site. No trees or shrubs that contain active bird nests shall be disturbed until all eggs have hatched, and young have fully fledged (are no longer being fed by the adults, and have completely left the nest site). No habitat removal or modification shall occur within the Ecologically Sensitive Area fenced nest zone even if the nest continues to be active beyond the typical nesting season for the species, until the young have fully fledged and shall no longer be adversely affected by the Program. The minimum distances of the protective buffers surrounding each identified nest site shall be the following per IPMP BMP 22, with some considerations depending on nest location and substrate: - 500 feet for large raptors such as buteos; - 250 feet for small raptors such as accipiters; - 250 feet for passerines; and - 1,000 feet for eagles. • A biological monitor or qualified biologist shall monitor the behavior of the birds (adults and young, when present) at the nest site to ensure that they are not disturbed by Program-related activities. Nest monitoring shall continue during Program-related construction work until the young have fully fledged, are no longer being fed by the parents and have left the nest site and surrounding area, as determined by a biological monitor. If a protective buffer must be modified, Midpen shall coordinate with the CDFW and/or the USFWS as appropriate prior to resumption of Program activities. • If a lapse in Program-related work of 15 days or longer occurs, another focused survey shall be conducted before Program activities are reinitiated.					
MM Biology-12: Marbled Murrelet Nest Protection Measures a. Implement IPMP BMP 22 with the additional provisions listed here. b. In areas within the range of marbled murrelet habitat as identified in the latest maps (e.g., Midpen 2007 maps), Midpen shall conduct a survey of habitats within 0.25-mile of the work area for trees that meet the Pacific Seabird Group definition of potential marbled murrelet nesting trees. If such trees are present within 300 feet of the work area or if a marbled murrelet nest is detected, Midpen shall coordinate with CDFW and USFWS before proceeding. If habitat trees are present within 0.25-mile of the work area but are greater than 300 feet from the work area, Midpen shall implement the following conditions: c. Work within the work area shall be confined to the period of September 15 to November 1 when possible. d. If activities cannot be conducted outside the breeding season, and must occur during the marbled murrelet breeding season (March 24 to September 15) Midpen shall: i. Coordinate with CDFW and USFWS. ii. Implement seasonal disturbance minimization buffers as listed in the table below and in the October 2020 document *Revised Transmittal of Guidance: Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California* (table below) (or the appropriate, CDFW-recommended or approved guidance at the time of implementation). The thresholds shown apply to noise-generating activities occurring during the midday period, when the risk of disturbance is lower and do not apply to activities within 2 hours of sunrise or sunset. Activities conducted during the dawn and dusk periods have special considerations for ambient sound level. If proposed activities will occur within 2 hours of sunrise or sunset, and if the ambient sound environment during the dawn and dusk period can reasonably be expected to be 5 dB or more quieter than the midday sound environment, then the estimated disturbance distance threshold should be calculated based on an ambient level 10 dB lower (i.e., one row up in the table) compared to the normal ambient rating in the table below.	Midpen biological monitor or qualified biologist and Contractor	Midpen	Where Program activities are proposed within the range of marbled murrelet habitat.	**Before Activity:** (1) Conduct a survey of habitats within 0.25-mile of the work area for trees that meet the Pacific Seabird Group definition of potential marbled murrelet nesting trees, and (2) implement appropriate measures based on survey results. **During Activity:** If activity occurs during the nesting season, conduct a sound level monitoring study, provide results to USFWS and CDFW, and comply with applicable measures based on survey results. **After Activity:** N/A	

Existing Pre-Program (Ambient) Sound Level[a]	Anticipated Action Generated Sound Level[b]			
	Moderate (71-80 dB)	High (81-90 dB)	Very High (91-100 dB)	Extreme (101-110 dB)

Mitigation Measure					Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
Natural Ambient (<=50 dB)[c]	165 feet	500 feet	1,320 feet	1,320 feet					
Very Low (51-60 dB)	40 feet	330 feet	825 feet	1,320 feet					
Low (61-70 dB)	40 feet	165 feet	825 feet	1,320 feet					
Moderate (71-80 dB)	40 feet	165 feet	330 feet	1,320 feet					
High (81-90 dB)	40 feet	165 feet	165 feet	500 feet					

Notes:

[a] Existing (ambient) sound level includes all natural and human-induced sounds occurring at the work area prior to the proposed action, and are not causally related to the proposed action.

[b] Action-generated sound levels are given in decibels (dB) experienced by a receiver, when measured at 15.2 m from the sound source.

[c] "Natural Ambient" refers to sound levels generally experienced in habitats not substantially influenced by human activities.

iii. Conduct a sound level monitoring study to determine the level of ambient and construction activity noise anticipated during construction activities to calculate seasonal disturbance minimization buffer widths. Midpen shall provide a description of methods and results of the study to USFWS and CDFW to coordinate site-specific avoidance measures 30 days prior to commencement of Program activities at the applicable location(s). In order to alert work crews to their presence, marbled murrelet seasonal disturbance buffers, as determined by the sound study and table above, shall be flagged in the field where they enter the work area. If Midpen chooses not to conduct the sound study, no Program activities shall occur within 0.25-mile of potential nest trees during the marbled murrelet breeding season (March 24 to September 15).

iv. If noise generating construction activity takes place during the breeding season (March 24 to September 15) within suitable Redwood and Redwood/Douglas-fir forests, construction activities shall be restricted to 2 hours after sunrise to 2 hours before sunset to minimize disturbance of potential nesting marbled murrelet using forest habitat as a travel corridor between inland nesting and coastal habitat.

v. Midpen or its contractor shall not conduct Program activities within a visual line-of-sight distance of 100 meters or less from a suitable nest tree as designated by a qualified biologist or biological monitor, or the appropriate distance per the latest, appropriate, CDFW-recommended guidance at the time of implementation.

e. If marbled murrelet protocol level surveys are conducted and do not indicate that the habitat is occupied by marbled murrelet, the seasonal and distance work restrictions may be lifted with approval from CDFW and USFWS. Protocol level survey procedures and information can be found at: http://www.pacificseabirdgroup.org/publications/PSG_TechPub2_MAMU_ISP.pdf or the appropriate, CDFW-recommended or approved guidance at the time of implementation may be used. If Midpen chooses to conduct marbled murrelet protocol level surveys, Midpen shall coordinate with CDFW and USFWS regarding the survey stations to ensure all contiguous suitable habitat is covered and good visuals of the sky and nearby flyways, if present, are provided. If marbled murrelet protocol level surveys are conducted, Midpen shall submit the report consistent with *Methods for Surveying Marbled Murrelets in Forests: A Revised Protocol for Land Management and Research* or the appropriate, CDFW-recommended or approved guidance at the time of implementation may be used.

MITIGATION, MONITORING, AND REPORTING PROGRAM

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
MM Biology-13: Special-Status Insect Host Plant Protection • Prior to conducting treatments in suitable habitat for special-status butterfly and moth species, surveys shall be conducted for the following host plant species during the appropriate blooming period: - Bay checkerspot butterfly: dwarf plantain (*Plantago erecta*), purple owl's clover (*Castilleja densiflora*), and exserted paintbrush (*Castilleja exserta*). - Smith's blue butterfly: coast buckwheat (*Eriogonum latifolium*) and seacliff buckwheat (*Eriogonum parvifolium*) - Monarch butterfly: all milkweeds (*Asclepias* sp.) - Unsilvered fritillary butterfly: violets (*Viola* sp.) - Opler's longhorn moth: California cream cups (*Platystemon californicus*) - Callippe silverspot butterfly (not known to be present but the host plant has potential to be present): Johnny Jump up (*Viola pedunculata*) • Host plants containing eggs, larvae, or pupae of special-status butterfly or moth species shall be avoided, and shall be protected with an appropriately-sized buffer as determined by a qualified biologist, taking into account the characteristics of the plant species and the nature of the proposed treatment. • Vegetation treatment may proceed if a qualified biologist determines that the host plants (1) are not occupied by special-status butterflies or moths, and (2) may benefit from treatment (such as if the host plants have already set seed and post-treatment conditions will favor them over non-native weed species).	Midpen biological monitor or qualified biologist	Midpen	Where Program activities are proposed within suitable habitat for special-status butterfly and moth host plants.	**Before Activity:** (1) Conduct survey for special-status butterfly and moth host plants during the appropriate blooming period, and (2) implement appropriate measures based on survey results. **During Activity:** Avoid host plants containing eggs, larvae, or pupae of special-status butterfly or moth species and protect with appropriate buffer. **After Activity:** N/A	
MM Biology-14: Salmonid Protection Measures • Vegetative debris shall not be stockpiled in areas where it could enter a stream, wetland or riparian area. • Corrective actions, such as repairs to erosion control BMPs necessary to preserve water quality and revegetation activities, are allowable year-round. • **Seasonal Work Period in Salmonid Critical Habitat:** Program activities within streams and associated riparian corridors that are designated Critical Habitat for steelhead and Coho salmon shall be limited to June 15 to October 31. • **Seasonal Work Period in Aquatic Habitats Outside of Critical Habitat.** Program activities within streams and associated riparian corridors that are not designated Critical Habitat for salmonids shall be limited to April 15 to October 31, or are permissible from November 1 to April 14 under the following conditions: a. Work shall not occur until the site has received no rainfall for a period of 10 days and there is no rain in the forecast for a period of 7 or more days, and work requires no greater than 5 days to complete. b. Work started during this period must be at least 50 percent complete within 2.5 days of beginning work. c. Winterization materials must be on hand and installed if unanticipated rainfall begins (defined as 0.5 inches of rain in a 24-hour period).	Midpen and Contractor	Midpen	Where Program activities are proposed within or adjacent to streams and associated riparian corridors that are designated Critical Habitat for steelhead and Coho salmon.	**Before Activity:** Implement and maintain corrective actions to preserve water quality. **During Activity:** (1) Do not stockpile vegetative debris where it could enter a stream, wetland, or riparian area, (2) work within streams and associated riparian corridors that are designated Critical Habitat for steelhead and Coho salmon limited to June 15 to October 31, and (3) work within streams and associated riparian corridors that are not designated Critical Habitat for steelhead and Coho salmon limited to April 15 to October 31 or permissible under additional conditions. **After Activity:** N/A	
MM Biology-15: Monarch Butterfly Overwintering Aggregation Protection Prior to any Program activities in tree groves comprised primarily or entirely of pine, cypress, fir, or eucalyptus that are within 2 miles of the Pacific Coast, a desktop record review shall be conducted to determine if the grove historically was occupied by monarchs. For all other tree groves comprised primarily or entirely of pine, cypress, fir, or eucalyptus that are within 2 miles of the Pacific Coast, a qualified biologist or biological monitor working under a qualified biologist shall survey the grove for aggregations of monarch butterflies during the overwintering season according to the Xerces Society's Western Monarch Count Protocol (Xerces Society 2019), available at https://www.westernmonarchcount.org or the latest protocol available at the time of implementation may be used.	Midpen biological monitor or qualified biologist	Midpen	Where Program activities are proposed in tree groves comprised primarily or entirely of pine, cypress, fir, or eucalyptus that are within 2 miles of the Pacific Coast.	**Before Activity:** (1) Survey tree groves for aggregations of monarch butterflies during the overwintering season according to the Xerces Society's Western Monarch Count Protocol and implement appropriate measures based on survey results, and (2) develop a long-term tree planting	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
Two surveys shall be conducted during the overwintering season, one during the Western Monarch Thanksgiving Count period (the three-week period centered on the Thanksgiving holiday), and a second during the New Year's Count period (the two-week period beginning the weekend prior to New Year's Day). • Each survey shall be conducted by two surveyors to provide multiple independent estimates of monarch numbers. • Surveys shall be conducted in the morning while temperatures are below 55˚ F (13˚ C) and monarchs are more likely to be clustered. • Surveys shall not be conducted during rain or strong winds due to poor visibility and the chance that individual monarchs shall be scattered on the ground. • If no monarch overwintering aggregations are observed, Program activities may proceed pursuant as long as they occur prior to November 1. If Program activities are delayed beyond November 1, then the grove shall be re-surveyed. • If a monarch overwintering aggregation of any size is detected or historical occupation is identified according to record reviews, then no Program activities may take place inside the tree canopy within 200 feet of the aggregation, when present. Activities outside of the canopy line but within 200 feet may proceed (i.e., treatment of low-growing vegetation outside of the tree grove) if a qualified biologist or monitor determines that the activity does not pose a threat to the monarch aggregation. • Groves with historical occupation shall not be altered without further consultation with USFWS and/or CDFW. • Once the aggregation disperses (typically by March), treatment of vegetation within 200 feet of tree(s) where monarch aggregations were observed may proceed if, as determined by a qualified biologist or monitor, it shall not result in significant alteration to wind and sunlight patterns within the grove. • If monarch overwintering aggregations are detected in eucalyptus removal areas, then a long-term tree planting strategy is necessary (see *Protecting California's Butterfly Groves* [Xerces Society 2017]). • Native tree species suitable for monarchs must be planted many years prior to eucalyptus removal with the understanding that they may not reach functional heights to provide wind protection and suitable dappled lighting for 15-30 years. Transplanting saplings from a local source may speed this process. Planting of eucalyptus shall be prohibited. Removal of eucalyptus may proceed once native replacement trees have reached sufficient size to provide wind protection within the grove. • Standing dead trees generally do not contribute to monarch overwintering habitat (Xerces Society 2017) and may be removed within the grove between April 1 and August 31, outside of the overwintering period, as determined appropriate by a qualified biologist or monitor. Sites where invasive dead trees have been removed may create opportunities for native tree planting within the interior of the grove. • If a eucalyptus grove where a monarch overwintering aggregation was previously detected is re-surveyed using the Western Monarch Count Protocol (Xerces Society 2019) and found to be unoccupied for 5 consecutive years, then the grove may be removed before native replacement trees have reached full size.				strategy if monarch overwintering aggregations are detected in eucalyptus removal areas. **During Activity:** Implement tree planting strategy. **After Activity:** N/A	
MM Biology-16: Prescribed Burns and Biological Resource Avoidance • All participants in the burn shall be briefed by a Resource Advisor on the special-status species potentially present, where they would likely be found, and who to contact if one is sighted. Resource Advisors shall (1) work with the ignition teams, (2) be a part of any ignition sequence planning, and (3) be in radio contact with either the Ignition Specialist or the Incident Commander directly to ensure quick communication and decision-making regarding the safety of sensitive wildlife. • Prescribed burns shall maintain the following buffers from various sensitive species and wildlife habitats: - Active bird nests shall be given species-appropriate buffers matching those outlined in MM Biology-11 and IPMP BMP 22: i. 250 feet for passerines ii. 500 feet for other small raptors such as accipiters iii. 1,000 feet for larger raptors such as buteos and eagles - A 10-foot buffer from San Francisco dusky-footed woodrat nests - A 20-foot buffer from occupied bat roosting trees - A 10-foot buffer from patches of special-status butterfly and moth host plants if prescribed burns occur before the plants have set seed. Patches of host plants that may benefit from fire may be burned if determined appropriate by a qualified biologist or biological monitor working under a qualified biologist.	Midpen and Contractor	Midpen	All prescribed burns.	**Before Activity:** (1) Brief all participants on special-status species present in the burn area, and (2) conduct visual surveys by walking transects throughout the proposed burn area no more than 24 hours prior to conducting a prescribed fire and implement applicable measures based on survey results. **During Activity:** (1) Maintain appropriate buffers from sensitive wildlife habitats, (2) retain all vehicles in the prearranged, marked parking area and roads, and (3) conduct	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
• The listed buffer areas may be managed using other vegetation management techniques following each burn (e.g., cattle grazing), but are to remain completely undisturbed during prescribed fire events. Every reasonable attempt shall be made to maintain 0.25 to 0.5 acre (0.1 to 0.2 hectare) of unburned habitat for every 10 acres (4 hectares) of burned habitat (e.g., 4 to 8 acres of retreat habitat are needed for a 160-acre burn, and 9 to 18 acres are needed for a 350-acre burn). Retreat areas shall be conserved randomly throughout the treatment area, especially in areas with known populations of San Francisco garter snake and California red-legged frog. These retreat areas may be naturally occurring areas such as rock formations, ponds and other wetland/riparian areas, areas with a high density of burrows, and other areas not prone to burn, or these areas may be created and maintained using hand tools or water to create fire-breaks or wet-lines. • No more than 24 hours prior to conducting prescribed fires, visual surveys shall be conducted by walking transects throughout the proposed burn area in an attempt to locate individual special-status reptile and amphibian species, including San Francisco garter snake, California red-legged frog, foothill yellow-legged frog, California tiger salamander, western pond turtle, Blainville's horned lizard, California giant salamander, Santa Cruz black salamander, and red-bellied newt. With permission from CDFW and/or USFWS, a permitted biologist or biological monitor shall capture, transfer, and release in a safe area any special-status reptiles or amphibians deemed to be in danger of being harmed by the prescribed fire activities. If individuals are located during the pre-treatment surveys but escape capture, an area approximately 50 feet (15 meters) in diameter around the individual shall be protected from the burn. If necessary, individuals may be held in captivity in a pillowcase for less than 24 hours and may later be released near the point of capture after the burn has been completed. The numbers of special-status reptiles and amphibians encountered and transferred to safe areas or held in captivity during treatment shall be reported to USFWS and CDFW. If San Francisco garter snakes are captured, each individual shall be photographed for use in identification. • All vehicles involved with the site-specific burn shall be retained in a prearranged, marked parking area in a clearing as close to the main road as possible. At least one monitor shall ensure wildlife is clear from the parking area while vehicles are arriving and leaving. All vehicles must stay on designated roads, and if it is necessary for a vehicle to travel off the designated main road, a monitor shall precede the vehicle to clear wildlife from the pathway of the vehicle. Only biological monitors specifically authorized by the USFWS and CDFW to handle San Francisco garter snake or California red-legged frog (normally these shall be individuals holding a federal recovery permit for the species) shall be allowed to handle, transport, and relocate individuals of these species. • Below ground temperature monitoring shall be conducted during the burn to monitor air temperatures in a representative subset of suitable San Francisco garter snake refugia. One or more biologists or biological monitors shall place ground temperature monitoring devices (e.g., "hobo thermocouples" in rodent burrows throughout the burn area to monitor changes in temperature in the burrows as fire moves across the landscape. The knowledge gained shall be useful in determining how to conduct future prescribed fires in San Francisco garter snake habitat in a manner that shall minimize potential effects to the species. • Immediately following each prescribed fire, the permittee shall search the affected post-treatment area to identify dead or injured individuals of all vertebrate taxa. Dead individuals of special-status species shall be collected and deposited at an approved repository. Injured individuals shall be handled only by a permittee authorized to capture and handle the species. Midpen shall ensure medical assistance is provided to injured animals by a certified wildlife veterinarian familiar with amphibian and reptile care. • Prescribed fire shall not be employed in tidal marsh habitats. • If an emergency situation necessitates the use of water from a pond occupied by California red-legged frog, a striker pump and intake hose may be used to draw water from one of the small wetland ponds in the burn area to fill engines or back pumps. The intake hose shall be screened with 0.25-inch mesh to prevent intake of California red-legged frogs. The burn plan details the use of lake and ocean water to fill helicopter buckets to aid suppression efforts. If a helicopter bucket is used, it shall draft from the center of the pond, to prevent uptake of California red-legged frogs that may potentially be present. • Within San Francisco garter snake habitat, post-burn monitoring shall be conducted as part of the Program activity and shall include (1) vegetative response to the burn, (2) wildlife response to the burn, and (3) fire behavior and burn conditions. Because the burn is intended to enhance San Francisco garter snake habitat, the monitoring emphasis for vegetation and wildlife shall be on the wildlife and habitat features that are considered to be necessary to support San Francisco garter snakes. The variables measured for San Francisco garter snake response to habitat are pre- and post-burn data on the (1) vegetation community in the burn area in order to determine vegetative response to the burn and (2) the frequency of valley pocket gopher (*Thomomys bottae*) burrows and other burrows. As part of its				below ground temperature monitoring during the burn. **After Activity:** (1) Search the affected post-treatment area immediately following each prescribed fire, (2) conduct post-burn monitoring within San Francisco garter snake habitat, and (3) measure the number of rodent burrows during the vegetation transect monitoring immediately after the burn and submit all data to USFWS.	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
standard post-fire evaluation, CAL FIRE and/or Midpen shall provide an analysis of the burn, including how the fire responded to weather and other burn conditions, and percent coverage of the burn within the boundaries of the burn unit. Beginning immediately after the burn, the frequency (number) of rodent burrows shall be measured during the vegetation transect monitoring. Vegetation monitoring shall include the establishment of four transects within and three transects outside of the burn area for comparative analysis. Transects shall be randomly established in burned and unburned areas and each transect shall measure 50 meters in length. A meter-square plot shall be established at 5-meter intervals along the transects. Vegetative composition and percent cover for all plant species shall be recorded for each plot. Transect sampling shall take place prior to the burn and at least once per year after the burn for 3 years. Response of native and non-native grasses and coyote brush to the burn shall be of particular interest. Data collected before, during, and after the burn, and the observations made during the evaluation of the burn shall be compiled into a report within 1 year following the burn. Upon completion, the report shall be submitted to USFWS.					
MM Biology-17: Sensitive Natural Communities • Before a Program activity is implemented, a Midpen approved botanist shall: (1) assess the site- and Program-specific threats to each sensitive natural community that might be impacted by the Program activity; and (2) recommend spatial buffers or other management actions that shall reduce potentially significant impacts on the sensitive natural community to less than significant levels. The botanist's recommendations shall be site-specific, and shall consider the specific Program activity being proposed, the resiliency of the community, and its susceptibility to potentially significant impacts associated with the Program activity. Midpen shall implement the botanist's recommendations, to the extent feasible. If Midpen is unable to implement the botanist's recommendations, or if there is uncertainty regarding the effects of a Program activity on the community, Midpen shall monitor the treatment areas after treatment at an interval determined appropriate by the qualified biologist or biological monitor working under a qualified biologist. If the monitoring indicates the Program activity has negatively impacted the community by resulting in substantial loss or degradation of the community, the terms of MM Biology-18 shall apply. • To the extent feasible, VMAs, fire management logistics areas, and firefighting infrastructure improvements shall be configured to minimize habitat fragmentation, especially in areas with unique structural components or habitat elements and frequency of treatment shall be carefully defined to reduce or minimize the likelihood of type conversion. If conversion is occurring, conditions of MM Biology-18 for compensatory mitigation shall be applied. • All vegetation removal within tidal marsh or in uplands within 50 feet of tidal marsh shall be conducted with hand tools only. No heavy equipment is permitted. • Vegetative debris (e.g., slash, chips) shall not be placed on top of vegetation in sensitive communities, unless prescribed in the VMP or PFP and determined by a qualified biologist or biological monitor working under a qualified biologist to not have negatively affect the community. • Personnel shall not walk through wetlands or other vegetation communities susceptible to trampling. • Prior to approving an off-road travel route, Midpen shall survey the route to ensure avoidance of sensitive biological resources, including special-status species and sensitive natural communities (or habitats). • If it is not feasible to locate staging areas in previously disturbed areas, they shall be located outside of sensitive communities (or habitats) that could suffer long-term impacts due to staging activities. Staging areas shall not be located in riparian or wetland communities, nor in any of the Group 1 sensitive communities identified for avoidance. • Burn piles shall be placed in areas away from any live vegetation that might be damaged by the burn. • Grazing shall be carefully managed, should it occur in or near a sensitive natural community, to limit the grazing duration and to ensure that erosion and sedimentation of waterways and riparian areas does not occur (in accordance with MM Geology-1).	Midpen biological monitor or qualified biologist and Contractor	Midpen	Where Program activities are proposed within sensitive natural communities.	**Before Activity:** (1) Assess site- and Program-specific threats to sensitive natural communities, (2) recommend spatial buffers or management actions to reduce potential impacts on the sensitive natural communities, and (3) survey off-road travel route. **During Activity:** Implement sensitive natural communities protection measures. **After Activity:** N/A	
MM Biology-18: Compensatory Mitigation for Impacts to Sensitive Natural Communities Midpen shall provide compensatory mitigation for Program impacts to Group 1 and Group 2 communities. The baseline ratio for impacts to Group 1 communities shall be 3:1 (e.g., 3 acres compensation for each acre impacted). The baseline ratio for impacts to Group 2 communities shall be 2:1. Several factors may dictate the need for a higher ratio (Clement et al. 2014, USACE 2015, USFWS 2016, State Water Resources Control Board 2019). They are:	Midpen	Midpen	Where Program activities permanently affect any Group 1 and Group 2 communities.	**Before Activity:** Determine the appropriate mitigation ratio for project (e.g., treatment). **During Activity:** Document compliance with the compensatory mitigation	

MITIGATION, MONITORING, AND REPORTING PROGRAM

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
1. **Mitigation Strategy:** The baseline ratio applies to mitigation projects that entail creation or restoration of the impacted community. Cswddc x One half point shall be added to any mitigation project that involves only enhancement of an existing community as recommended by a Midpen-approved biologist (e.g., seed within native species, removal of human-made infrastructure such as fences or hardscape, treatment of invasive species). 2. **Temporal Loss:** The baseline ratio assumes there shall be no temporal loss of the community. Therefore, the baseline ratio only applies to mitigation projects that are completed within a year after impacts occur. If the mitigation project is not initiated within a year after impacts occur, the ratio shall be increased by 0.2 for each year of lag time between the time of impacts, and the start of mitigation. For example, if mitigation for a Group 2 community is not expected to be initiated until two years after the impacts occur, the mitigation ratio shall be 2.2:1. 3. **Uncertainty:** There is inherent uncertainty in whether a mitigation project will fully replace the functions that are lost from the impact site. As a result, the mitigation ratio must be commensurate with the risk that a mitigation project will not achieve the designated goal, which is generally to replace the functions that are lost from the impact site. The baseline ratios account for the uncertainty inherent in all mitigation projects because they shall achieve "no net loss" of sensitive community functions even if some (relatively small) portions of the mitigation site fail to achieve the desired conditions. However, the baseline ratios assume a relatively high probability of success. Due to Midpen's expertise and experience with mitigation projects, Midpen assumes the mitigation project shall succeed if: (a) Midpen has successfully completed comparable mitigation projects, or (b) scientific literature supports the inference that the mitigation project is likely to be successful (e.g., due to its simplicity). If the proposed mitigation project does not satisfy either criterion, one point shall be added to the baseline ratio (e.g., the ratio for a Group 2 community shall be increased to 3:1). 4. **Distance:** Compensatory mitigation ratios are generally dependent on the distance of the mitigation site from the impact site. To the extent feasible, Midpen shall mitigate on Midpen property, and within the same watershed as the impact site. 5. **Kind:** The baseline ratios assume "in-kind" mitigation (i.e., the mitigation site replaces the same sensitive natural community or wetland type as the one impacted by the Program). In some instances, there may be ecological benefits to "out-of-kind" mitigation. There shall be no increase in the mitigation ratio for mitigation projects that restore, create, or enhance a Group 1 community as compensation for impacts to a Group 2 community. Midpen shall document the scientific justification for all proposed out-of-kind mitigation projects. No out-of-kind mitigation shall be allowed for impacts on wetland or riparian communities unless authorized by the regulatory agency(ies) with jurisdiction over the impacted resource. 6. **Other Impacts:** A mitigation ratio greater than 1:1 may be needed to account for a project's indirect impacts, and for its contribution to cumulative impacts.[1] The baseline ratios account for these impacts. To determine the appropriate mitigation ratio for a given project (e.g., treatment), Midpen shall apply the factors described above, in the order listed. Midpen shall maintain a ledger that documents: 1. Impacts on sensitive communities, including type of community impacted, acreage impacted, year(s) impacts occurred, and activity that caused the impact. 2. The mitigation ratio applied to each Program activity, and the rationale for that ratio. The rationale shall include a formula that incorporates the variables outlined above. 3. Any additional mitigation requirements imposed by the regulatory agencies (e.g., in a Streambed Alteration Agreement from CDFW) beyond what is already described above. 4. Mitigation projects, including the mitigation strategy, type, location, acreage, and date completed.				requirements and provide ledger to the regulatory agencies. **After Activity:** Monitor the site in accordance with Midpen's monitoring program.	

[1] Under CEQA, mitigation must be roughly proportional to the level of impacts.

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
The ledger shall be used to document compliance with the compensatory mitigation requirements. A copy of the ledger shall be made available to the regulatory agencies. Any plants or seeds needed for a mitigation project shall be derived from sources determined appropriate by the Midpen-approved botanist. Dependent upon the species, plants or seeds shall be sourced from locally-appropriate genetic material and comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible. **Performance Standards.** Projects designed to mitigate significant impacts to sensitive natural communities shall be considered successful once they achieve the membership rules described in the most current version of the Manual of California Vegetation. A District Approved botanist shall implement the Relevé and Rapid Assessment (RA) vegetation sampling techniques (CDFW and CNPS 2019) to monitor sensitive natural community development at mitigation sites until the site achieves the membership rules (e.g., percent relative cover) described in the most current version of the Manual of California Vegetation, after which the site shall be monitored in accordance with Midpen's monitoring program.					
MM Biology-19: Wetlands and Other Potential Jurisdictional Aquatic Resources Wetlands and other potential jurisdictional waters that may be impacted by the Program shall be formally delineated by a biologist with expertise in wetland science. In addition to conducting the delineation, and in accordance with the recommendations provided by Castelle et al. (1994), the biologist shall assess the following criteria to determine the buffer size needed to protect the jurisdictional resource from indirect impacts: (1) resource functional value, (2) intensity of adjacent land use, (3) buffer characteristics, and (4) specific buffer functions required. The biologist shall document the results of this assessment and the buffer recommendations in a report to Midpen. Midpen shall not conduct any Program activities that might directly or indirectly impact jurisdictional wetlands and waters unless it possesses permits from the appropriate State and federal regulatory agencies. Midpen shall make every attempt to avoid direct and indirect impacts to wetlands and other jurisdictional waters. If complete avoidance is not possible, a biologist with expertise in wetland science shall document baseline conditions according to the California Rapid Assessment Method (CRAM) prior to any potential impacts. According to the U.S. Army Corps of Engineers (2015): • CRAM is a standardized, cost-effective tool for assessing the health of wetlands and riparian habitats. The overall goal of CRAM is to provide a rapid, scientifically defensible, and repeatable assessment method that can be used routinely for wetland monitoring and assessment. CRAM consists of assessing aquatic resources with respect to four overarching "attributes," i.e., buffer/landscape context, hydrology, physical structure, and biotic structure. A number of "metrics" address more specific aspects of aquatic resource condition within each of these attributes. Each metric is assigned a numeric score based on either narrative or schematic descriptions of condition or thresholds across continuous values. Metric descriptions are based on characteristics of aquatic resources observed across a range of conditions, such that the highest score for each metric represents the theoretical optimum condition obtainable for the aquatic resource feature being evaluated. • The baseline CRAM assessment shall be used in two ways: (1) to monitor the effectiveness of the buffer in preventing indirect impacts to the wetland community; and (2) to ensure compensatory mitigation replaces the wetland functions impacted by the Program. Compensatory mitigation for impacts to wetland and other jurisdictional waters shall be provided in accordance with USACE guidelines, including: (1) *Guidelines for Preparing a Compensatory Mitigation Plan*; (2) *Attachment 12501.6 – SPD Mitigation Ratio Checklist*; (3) *Regional Compensatory Mitigation and Monitoring Guidelines*; and (4) *2501-SPD Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios* (USACE 2010, 2012, 2015, 2017). If possible, compensatory mitigation for impacts to wetlands and other jurisdictional waters shall restore a comparable aquatic feature within the same watershed as the impact. Midpen shall adopt performance standards consistent with the USACE's *Uniform Performance Standards for Compensatory Mitigation Requirements* (USACE 2012). Mitigation monitoring shall adhere to the *Regional Compensatory Mitigation and Monitoring Guidelines* (USACE 2015).	Midpen	Midpen	Where Program activities are proposed within wetlands and other potential jurisdictional aquatic resources.	**Before Activity:** (1) Delineate wetlands and other potentially jurisdictional waters, (2) document baseline conditions of the wetland or other jurisdictional waters if complete avoidance is not possible, (3) obtain necessary permits from the appropriate agencies. **During Activity:** Avoid impacts on jurisdictional waters. **After Activity:** N/A	
MM Biology-20: Significant and Heritage Tree Ordinances Prior to conducting any work that involves tree removal, biologist or other personnel qualified in tree identification shall identify if any County or local protected and heritage tree ordinances are relevant to the area of work. If an ordinance would apply to the area of work, the area of work shall be investigated by the biologist or personnel qualified in tree identification to identify if any trees subject to the ordinance are found in the project area. If a tree subject to the ordinance is in the area of work, the tree shall be clearly marked as a	Midpen and Contractor	Midpen	Where tree removal occurs.	**Before Activity:** (1) Identify County and local protected and heritage tree ordinances, (2) identify trees that are subject to the ordinance, (3) mark trees for	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
"Leave Tree" so that it is not accidentally damaged or removed during work. If a tree that qualifies as a protected or heritage tree must be removed, the appropriate steps shall be implemented to obtain the appropriate permits for tree removal. If trees within the CalTrans right-of-way must be removed, the tree removal must be part of the Encroachment Permit, to be reviewed by CalTrans, which may require tree replacement in its permit terms.				avoidance, and (4) obtain necessary permit to remove protected and heritage trees or trees within Caltrans right-of-way. **During Activity:** Avoid impacts on trees that are marked for avoidance. **After Activity:** N/A	
Cultural and Tribal Cultural Resources					
MM Cultural-1: Pre-Activity Surveys and Avoidance of Impacts to Cultural Resources Prior to conducting any work associated with the WFRP that could disturb the ground surface or subsurface, the work areas shall be compared against Midpen's GIS data to determine if the area has been previously surveyed and, if it has been surveyed, if any historic or archaeological resources or tribal cultural resources are found in the work area. Any resources that have not been evaluated shall be assumed eligible for listing in the CRHR and assumed significant. If the GIS data shows that the proposed areas where soil disturbance below the surface via heavy equipment or burning (i.e., for VMP activities involving heavy equipment, prescribed fires under the PFP, and any work that involves grading under the Wildland Fire Pre-Plans) have not been previously surveyed, then a discretionary archival-records search at the California Historical Resources Information System, Northwest Information Center, can be completed. If the area is still not found to have been previously surveyed, a pre-activity cultural-resources survey shall be conducted by a qualified archaeologist or cultural resources specialist in accordance with industry standards prior to performing work unless vegetation is too dense, making a survey impossible. In the event vegetation is too dense, making a pre-activity survey challenging or impossible, the training conducted under IPMP BMP 26 shall be sufficient to permit work to be conducted using only manual techniques accessed on foot. New resources noted during the field survey shall be recorded and mapped on appropriate California Department of Parks and Recreation 523 forms. In the case of a previously recorded resource, an updated California Department of Parks and Recreation 523 form detailing current condition shall be completed, as appropriate. Any historical or archaeological resources (not including built-environment historic features) located in the work area (as identified in either previous surveys, in a discretionary records search, or during pre-activity surveys) plus a 50-foot buffer shall be identified on any activity plans. The boundaries around the resource/buffer shall be temporarily marked, such as with fencing or flagging. If work must commence in the sensitive area, it can only be performed using hand tools or hand- powered tools, cannot include ground disturbance below the topsoil layer, and can only be accessed on foot. Alternatively, the resource can be evaluated for eligibility under the CRHR. If found ineligible and not a tribal cultural resource, work could proceed as normal. If found eligible or to be a tribal cultural resource, impacts on the resource must be avoided (through total avoidance of the area or through use of hand methods only in the area of the resource, as described here). If not avoidable, MM Cultural-2 shall be implemented. After work is completed, all cultural resource delineators (e.g., flags or fencing) shall be removed in order to avoid potential vandalism, unauthorized excavation(s), etc. Midpen shall contact and consult with local Native American groups identified by the Native American Heritage Commission and request input on Tribal Cultural Resources within the project areas if any prehistoric resources are identified during pre-activity surveys and impacts to these resources cannot be avoided or minimized (such as through the use of hand tools). The Midpen Project Manager shall have the discretion to consult, depending on the potential impacts anticipated from the Program activity. Information on the proposed activity, the results of the information review(s) and field inventory, and any Native American input shall be reported in a Memo to the File with the implemented mitigation measures based on anticipated impacts.	Midpen and qualified archaeologist or cultural resources specialist or Native American groups	Midpen	All work areas prior to conducting Program activities.	**Before Activity:** Consult the GIS cultural-resources layer for the presence of recorded sites. **During Activity:** 1) Avoid recorded resources or impacts on resources or use only hand methods in resource areas and (2) examine area where piles are proposed for resources. **After Activity:** Remove resource delineators, add any newly discovered resources to GIS database.	
MM Cultural-2: Treatment of Unavoidable Resources For any resources either discovered during implementation of activities (per IPMP BMP 26) or found during pre-activity surveys under MM Cultural-1 and that cannot be avoided, recordation, additional archaeological testing, Native American consultation (if pre-historic), and	Midpen and qualified archaeologist or	Midpen	Any area where cultural resources	**Before Activity:** Determine if resource cannot be avoided and prepare Treatment Plan and data	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
data recovery shall be implemented. Data recovery for any significant cultural resources that cannot be avoided or preserved in place shall be guided by a Treatment Plan, to be submitted to Midpen for approval and completion. Impacts shall be assessed for the installation of new permanent infrastructure under the Wildland Fire Pre-Plans near a built-environment historic feature, landscape, or district. The new infrastructure shall either be relocated if an effect is likely or data recovery implemented in accordance with a Treatment Plan (as previously discussed). A report of the findings and resource interpretation, disposition of any recovered cultural materials, and recommendations for future resource protection shall be completed and filed with Midpen, interested Native Americans, the California Historical Resources Information System (if pre-historic), and the Northwest Information Center.	cultural resources specialist		impacts cannot be avoided.	recovery as well as consult tribes if pre-historic. **During Activity:** For resources found during work that cannot be avoided, prepare Treatment Plan and data recovery. **After Activity:** Notify appropriate parties and agencies.	
MM Cultural-3: Human Remains If human remains and associated or unassociated funerary objects are exposed during vegetation management, work within 50 feet of the discovery shall be halted and the find protected from further disturbance in accordance with Midpen protocols for resource protection. The County Coroner or Medical Examiner shall be notified immediately and, in the event of the determination that the human remains are Native American remains, notification of the Native American Heritage Commission shall be undertaken to obtain a most likely descendant (MLD) (PRC § 5097.98) for treatment recommendations. Midpen, the archaeological consultant, and the MLD shall make all reasonable efforts to develop an agreement for the treatment of human remains and associated or unassociated funerary objects with appropriate dignity (CEQA Guidelines Section 15064.5[d]). The agreement shall take into consideration the appropriate removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. Implementation of the Treatment Plan shall be undertaken by Midpen, and any findings shall be submitted in a report to the MLD and filed with the California Historical Resources Information System, NWIC.	Midpen and qualified archaeologist or cultural resources specialist or Native American groups	Midpen	All Program areas, if applicable.	**Before Activity:** N/A **During Activity:** (1) Avoid known location of human remains, (2) cease activity if human remains are uncovered, (3) appoint an MLD, (4) protect human remains until a decision is reached, and (5) if avoidance is not possible, Midpen, a professional archaeologist, and an MLD shall be consulted and human remains and associated or unassociated funerary objects shall be removed from the location and relocated to selected location in accordance to decision reached. Once remains are moved, then the activity can commence again in this area. **After Activity:** N/A	
Geology and Soils					
MM Geology-1: Prescribed Herbivory Land and Trail Control Livestock will be used for vegetation management to reduce the use of chemical herbicides, to control invasive vegetation, and to promote the growth of native vegetation. Methods shall be implemented to reduce the potential creation of prescribed herbivory trails and erosional features, including the following: • Limit or prohibit prescribed herbivory within 100 feet of lakes/reservoirs, creeks, streams, riparian corridors, and wetlands, using fencing or natural features to prevent livestock from entering streams and riparian areas, depending upon a qualified professional's assessment. The following measures would be considered by the qualified professional and implemented where appropriate: - In riparian areas, livestock shall be excluded from the top of bank of a defined channel by installing fencing on the edge of riparian canopy where topography does not naturally exclude access. - Water and feed troughs shall be installed away from natural water sources. - In wetlands, livestock shall be excluded only where the percent cover of vegetation is low. • Implement methods, which could include rotating or providing multiple feeding areas to minimize excessive congregation of animals in any one location for too long, as determined by a qualified professional. • Limit the number of animals in a particular-sized area using the stocking-rate equation taking into account days assumed to graze, slope, yield of the land, number of animals, weight of animals, and other appropriate factors.	Midpen and/or Contractor	Midpen	Prescribed herbivory areas.	**Before Activity:** Install fencing as needed. **During Activity:** (1) Limit number of animals in an area based on appropriate calculations, and minimize congregation of animals in any one location, (2) repair damaged fencing or erosion control features, and (3) conduct surveys during prescribed herbivory to identify problem areas. **After Activity:** (1) Permit appropriate rest periods after prescribed herbivory, and (2) remediate any bare areas.	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
• Conduct surveys of the prescribed herbivory area during active grazing; identify if trails or other erosion features are forming. • Ensure there are appropriate rest periods between active prescribed herbivory in any one area to allow regrowth of plants and appropriate amounts of residual dry matter (RDM) to remain on the ground to achieve desired vegetation-management objectives. • If prescribed herbivory trails or damaged areas form, the bare area shall be remediated by decompacting the soil and discontinuing prescribed herbivory in the area until the trails are revegetated, as determined by a qualified professional. • Excessive livestock grazing on steep slopes (generally slopes with more than 35 percent grade) shall be discouraged or avoided using the methods described above (e.g., water and feed trough locations, stocking-rate equation) or fencing where determined appropriate by a qualified professional. • During surveys of active prescribed herbivory, conduct ongoing surveillance of installed erosion control features around riparian areas and any fences installed. • Repair damaged fencing or erosion-control features as necessary.					
MM Geology-2: Erosion Control and Slope Stability Measures In addition to Midpen's erosion-control measures (IPMP BMP 28), control measures shall be implemented to ensure vegetation management does not result in erosion, loss of topsoil, or slope instability in areas where work could expose bare soils or create loss of root-soil matrix strength. General erosion-control measures are identified that apply to all projects. Generally, if groundcover or native mulch/organic matter is determined to be less than 70 percent following work or if work is proposed to occur on steep slopes (over 35 percent slope), then specific control measures, as identified here, shall be implemented as determined appropriate by the qualified personnel. Other site conditions, such as unconsolidated soils or evidence of landslides, or the scale of project proposed may trigger the need for the qualified personnel to determine that the control measures shall apply. Prior to conducting work in any given area under any management action that could result in erosion or slope instability (e.g., prescribed burns, tree removal, weed removal, or forest treatments that could reduce the groundcover and expose soil, or for infrastructure creation such as new roads, pipelines, or water storage tanks) a review of site conditions shall be conducted. The review of site conditions may include but is not limited to a desktop review of slope, LiDAR, historic evidence of landslides (e.g., Wentworth et al. 1997), local hazard mapping and safety plans, proximity to infrastructure, and modeling of landslide susceptibility GIS data (e.g., Wills et al. 2011) as well as a site visit for existing signs of erosion or slope instability (e.g., rills, slumped soil). Depending on the slope and the downslope resources that could be impacted by slope failure (e.g., roads, waterbodies, or habitat), erosion-control and slope-stabilization measures shall be determined prior to implementation of work, based on the list below. Generally, if an action would expose soils (leaving groundcover or native mulch/organic matter less than 70 percent), then measures to protect soils, minimize erosion, and prevent slope instability shall be implemented. In addition, management actions may be adjusted to achieve similar results. The measures to be implemented shall depend on the site's specific characteristics and the type and extent of vegetation management work to be performed. The inspection and determination of appropriate measures shall be made by qualified personnel with knowledge and experience (a qualified SWPPP developer [QSD] or a qualified SWPPP practitioner [QSP]; licensed geologist [P.G. or C.E.G.]; licensed engineer; Registered Professional Forester [RPF]; etc.) in the application of erosion-control and slope-stabilization measures through training or field experience with control-measure installation. The qualified personnel shall memorialize in writing their field observations and corresponding recommendations regarding installation of control measures. A licensed geologist or RPF shall conduct the site inspection for projects that would involve substantial grading or vegetation removal[a] on active slide areas, unstable areas, or unstable soils (as defined in the California Forest Practice Rules) if the following applies: • in previously undisturbed soils; or • up to 0.5-mile above or 0.25-mile below infrastructure, including potentially occupied structures. A licensed geologist or RPF shall conduct site inspections for new road additions that are greater than 600 feet, regardless of the proximity to active slide areas, unstable areas, or unstable soils. The licensed geologist shall identify specific control measures that must be implemented, which may include but are not limited to the control measures identified in this mitigation measure. In areas that were previously analyzed by an RPF or qualified geologist, the District shall review the prior recommendations for consistency with the proposed activity and determine if a new review is warranted. **General Control Measures**	Midpen and/or Contractor	Midpen	Any areas where qualified personnel determine erosion and slope stability is a concern (e.g., the ground is disturbed and soils are exposed through vegetation management activities areas on steep slopes).	**Before Activity:** Inspect areas prior to treatment to assess the potential for erosion and soil instability. **During Activity:** Implement protection measures as needed to avoid or minimize erosion and slope instability. **After Activity:** Conduct inspections as needed, depending on the size and nature of the work and the site, to ensure that erosion is not occurring and to remove any erosion control devices once they are no longer needed.	

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The following measures shall be considered for implementation and required as determined appropriate by the qualified personnel during work as applicable: • Minimize areas to be disturbed to the greatest extent feasible. • Shut down use of heavy equipment, skidding, and truck traffic when soils become saturated and unable to support the machines. • No substantial ground disturbing work (e.g., use of heavy equipment, pulling large vegetation) shall occur during rain events and 48 hours after a rain event, defined as 0.5 inch of rain within a 48-hour or greater period, using the NOAA website as the official record for rain events. **Reduced Groundcover Control Measures** The following measures shall be considered for implementation and required as determined appropriate by the qualified personnel during work if the activity may leave less than 70 percent of groundcover or native mulch/organic material as determined to be applicable by qualified personnel: • Sow native grasses and other herbs on denuded areas where natural colonization or other replanting will not occur rapidly; use slash or chips to prevent erosion on such areas. • Use surface mounds, depressions, logs, rocks, trees and stumps, slash and brush, the litter layer, and native herbaceous vegetation downslope of denuded areas to reduce sedimentation and erosion, as necessary to prevent erosion or slope destabilization. • Install approved, biodegradable erosion-control measures and non-filament-based geotextiles (e.g., coir, jute) when: - Conducting substantial ground-disturbing work (e.g., use of heavy equipment, pulling large vegetation) within 100 feet and upslope of currently flowing or wet wetlands, streams, lakes, and riparian areas; - Causing soil disturbance on moderate to steep (10 percent slope and greater) slopes; and - Removing invasive plants from stream banks to prevent sediment movement into watercourses and to protect bank stability. • Sediment-control devices, if installed, shall be certified weed-free, as appropriate. Sediment-control devices shall be inspected daily during active construction to ensure that they are repaired and working as needed to prevent sediment transport into the waterbodies. Once work is completed, the areas shall be inspected at least annually if accessible, until groundcover exceeds 70 percent and slopes have stabilized. At that time, erosion-control and slope-stability devices may be removed at the discretion of District staff. **Steep Slopes Control Measures** The following measures, in addition to the ones described above, shall be considered for implementation and required as determined appropriate by the qualified personnel during work conducted on steep slopes (greater than 35 percent) and as determined to be applicable by qualified personnel: • Avoid use of heavy equipment on slopes greater than 35 percent unless qualified personnel determine that the specialized equipment does not impact slope stability. • Prescribed and pile burns shall be performed outside of perennial and intermittent streams and of riparian forest/ woodland. A 50-foot buffer around perennial and intermittent streams shall be maintained when the burn is proposed upslope of the stream on slopes greater than 35 percent. • Avoid installation of cleared areas, including spur roads or staging areas, on steep slopes, particularly over 50 percent slope, where feasible. Where not feasible, a licensed geologist/engineer or RPF shall be consulted, as required above. The licensed geologist/engineer shall identify and require implantation of appropriate design and control measures including but not limited to those identified in *Low-Volume Roads Engineering* (Keller & Sherar, 2003); *Handbook for Forest, Ranch, and Rural Roads* (Weaver, 2015); latest *California Forest Practice Rules;* or other suitable engineering guidance, such as: - Locate roads on well-drained soils and slopes where drainage moves away from the road - Provide adequate surface drainage - Avoid wet and unstable areas (seeps, springs, etc.) - Use the natural topography to control or dictate the ideal location of road or cleared area (e.g., staging area); use saddles, follow ridges, use bench areas, etc.					

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
Recommendations provided in the assessment shall be implemented as needed to ensure that slope instability does not occur. When a desktop review or site visit reveals that steep slopes (greater than 35 percent), active slides, unstable areas, or unstable soils (as defined in the California Forest Practice Rules) are located above infrastructure, sensitive habitat, or structures potentially occupied by people, a licensed geologist/engineer shall perform an assessment to evaluate whether the proposed intensive tree removal (e.g., removal of eucalyptus grove/cluster rather than isolated trees), could cause erosion, further slope instability, or a public safety concern. Other recommendations could include measures such as stabilizing slopes with mats or natural materials after tree removal and replanting to bind soils. Note: [a] Substantial grading is defined as cuts above 3 feet and fill above 1.5 feet with lengths greater than 20 feet or removal of greater than 20 linear feet of shrubs and trees on an abandoned/little-used road on cross slopes greater than 55 percent. Substantial vegetation removal is defined as removal of all vegetative cover (both aboveground and belowground root structure for shrubs; aboveground for trees) for an area with a cross slope greater than 55 percent and in excess of 20 linear feet in any direction.					
MM Geology-3: Fire Lines During Prescribed Burns The following measures shall be implemented during prescribed burns to reduce erosion from fire lines: • Use existing barriers such as roads, trails, or wet lines as fire lines. If new fire lines must be established for a prescribed burn, fire lines shall be restored as described below. • Restore fire lines upon completion of the burn if they are not used again (unless they are existing roads, trails, or other permanent elements). Utilize erosion-control measures, such as sediment traps, during restoration to reduce sedimentation impacts. Complete restoration activities within one month after a fire line is created unless the fire line is planned to be used during another burn within one year. Restore all fire lines that do not use existing infrastructure (i.e., roads, trails, or other permanent elements) within one year of use. Rehabilitation methods may include use of a hydromulch with locally collected, genetically appropriate, native species; pulling duff, litter, and cut material back over lines; and/or distribution of locally chipped fuels on the lines. • Design prescribed burn boundaries to avoid gullies and highly erodible soils to the fullest extent possible.	Midpen and/or Contractor	Midpen	Prescribed burn sites.	**Before Activity**: Determine fire lines. **During Activity**: Set up provisions as specified in the measure. **After Activity**: Restore fire lines that will no longer be used upon completion of work.	
MM Geology-4: Soil Assessment for Construction of New Water-Supply Pipelines The following soil-assessment measures shall be implemented to ensure significant risks to life or property do not occur as a result of water-supply pipeline construction in an expansive soil in Ravenswood OSP or Stevens Creek Shoreline Nature Area: 1. Consult appropriate GIS data (e.g., USDA, 1991; USDA, 2015) to determine if expansive soils may be present within the proposed construction site. 2. Conduct a field assessment using a proven scientific test or method, such as a soil expansion index test, to verify presence of expansive soils on the site. 3. If verified to be present, determine if the expansive soils can be avoided through design specifications. If appropriate design measures cannot be utilized to avoid expansive soils, no excavated soil shall be used for fill during construction; instead, clean fill soils with a low expansion potential shall be used.	Midpen and/or Contractor	Midpen	Locations of new water-supply pipeline construction in Ravenswood OSP or Stevens Creek Shoreline Nature Area.	**Before Activity:** (1) Obtain permits if appropriate and (2) prepare plans and design specifications according to results of soil assessment. **During Activity:** Monitor construction and ensure proper construction practices are implemented. **After Activity:** Verify appropriate soils were used during construction.	
Hazards, Hazardous Materials, and Wildland Fire					
MM Hazards-1: Avoidance of Contaminated Sites To prevent exposure of workers to hazards or release of contamination into nearby waterways or clean soils, the following shall be conducted prior to any work within the boundary of any known contaminated sites or contaminated sites listed on government databases (e.g., the former Almaden AFS, Madonna Creek Ranch): • Existing data and reports on the areas of contamination and remediation, or the SFBRWQCB, shall be consulted and a map prepared identifying any areas with residual contamination (e.g., lead paint, asbestos, petroleum) that are still present after remediation. This map shall be updated at least annually if any fire management activity is proposed in the area.	Midpen and/or Contractor	Midpen	Known contaminated sites (e.g., Former Almaden AFS within Sierra Azul OSP, Madonna Creek Ranch within Miramontes OSP).	**Before Activity:** Review data and reports and prepare or update map of contaminated areas. **During Activity:** Consult map and avoid areas of residual contamination or avoid ground disturbing activities, depending	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
• The areas identified on the map as containing residual contamination shall be avoided either entirely (e.g., no cutting or entrance into site) or ground disturbing activities avoided (e.g., vegetation cutting allowed), depending upon a determination made by qualified personnel.				on determination made by qualified personnel. **After Activity:** N/A	
MM Hazards-2: Fire Risk Reduction for Stockpiling and Pile Burning The following measures shall be implemented to reduce hazards associated with pile burning: • Pile burning shall only be allowed on days when fire is less likely to spread (e.g., wind speeds are less than 15 mph). • Piles shall not be constructed in areas where burning cannot be safely controlled, such as bottoms of steep, vegetated hills. • Piles shall be set back from roads and trails at a distance specified by Midpen to minimize risk to recreationalists and other users. • All requirements of CAL FIRE or the BAAQMD or MBARD shall be met, including any permit, notification, burn bans, and reporting requirements. • Public notification shall be provided at least 24 hours in advance of less than 10 pile burns (defined as 10-foot-wide by six-foot-high) to immediately adjacent residents (within 1,000 feet), and at trailheads and access roads leading to the area with piles proposed for burning. For 10 or more piles (defined as 10-foot-wide by six-foot-high), noticing shall extend to residents within 1 mile. The public notification shall include current contact numbers to the appropriate burn coordinator.	Midpen and Contractor	Midpen	Wherever stockpiles of slash are made and piles burned.	**Before Activity:** Notify public and obtain all permits and make all necessary notifications as required by BAAQMD and MBARD. **During Activity:** (1) Ensure that piles are located appropriately and (2) ensure proper weather conditions during pile burning. **After Activity:** N/A	
MM Hazards-3: Safety Around Prescribed Burns **Trails and Midpen-Owned or Managed Roads** Midpen-owned or managed roads and trails shall be closed to public recreational and other unaffiliated private vehicle (e.g., County or private landowner vehicles on Midpen managed but not owned land) access within at least 500 feet of the outermost edges of a prescribed burn (or less with Burn Boss and Midpen concurrence). Midpen-owned or managed roads and trails shall be posted and blockaded with temporary fencing or the like. Notices of closures shall be posted at the trail heads or road entrances and on Midpen's website. Additional measures, such as staffing trail head closures, can be implemented as needed. **Public Roads** If possible, public roads within 500 feet of the outermost edges of a prescribed burn shall be closed in coordination with the appropriate agency (e.g., Caltrans). In the event this is not feasible due to volume of traffic or lack of alternative routes, a Traffic Control Plan shall be prepared and adopted in coordination with the appropriate agency. The Traffic Control Plan shall be designed to allow safe passage along roads adjacent to a prescribed burn and shall include the following at a minimum: • Requirement to coordinate with local law enforcement (e.g., County Sheriff, California Highway Patrol). • Installation of temporary signage at intervals ahead of and adjacent to the prescribed burn indicating that a prescribed burn is in progress. • Use of flaggers to slow traffic during the burn or stop traffic if wind conditions shift, resulting in smoke crossing the road.	Midpen and Contractor	Midpen	Within 500 feet of the outer edges of a prescribed burn.	**Before Activity:** (1) Post notices of closures at trailheads and online and (2) prepare a Traffic Control Plan, if required. **During Activity:** (1) Place blockades along Midpen-owned or managed roads and trails, (2) staff closures of Midpen-owned or managed roads and trails, if needed, and (3) implement a Traffic Control Plan for public roads adjacent to prescribed burns, if needed. **After Activity:** Remove blockades and signage.	
Hydrology and Water Quality					
MM Hydrology-1: Water Quality Protection During Waterway Crossing or Work Near Waterbodies Vehicles and heavy equipment shall avoid new instream crossings. On rare occasions, such as to perform work to create or maintain FRAs, equipment may need to access off an existing road into a treatment area through a waterbody. If instream (waterway) crossings must occur because no other options for access are reasonably available, the crossing shall be performed when the stream is dry and soils are not saturated. The crossing shall be performed in a way that does not result in any permanent alteration of the stream bank or bed (e.g., choosing areas with stable soils and the least slope or with vegetation to protect the bed and bank). If water is flowing or the stream has flow or saturation, temporary plates or the equivalent shall be installed from bank to bank for equipment access across the waterway. Increased use of existing stream crossings may require upgrades and/or re-engineering of the existing road or water crossing structure. If a new instream crossing or refurbishment of an existing crossing that could impact the bank or bed or riparian vegetation is needed, the crossing shall only be performed after and in accordance with the appropriate 1602 Streambed Alteration Agreement from CDFW and	Midpen and Contractor	Midpen	Anywhere vehicles and heavy equipment must cross streams or creeks (waterways).	**Before Activity:** (1) Obtain permits and (2) install plates or record vegetative conditions, as appropriate. **During Activity:** Minimize soil or vegetation disturbance, as appropriate. **After Activity:** Restore crossing area.	

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Applicable Locations	Timing and Performance Standards	Compliance Verification
Section 404 and 401 Clean Water Act permits. All soils shall be restored after the instream crossing and banks revegetated, as needed, after the work is completed, in accordance with permits.					
Noise					
MM Noise-1: Noise Restrictions **Construction Noise Standards** Midpen shall determine the jurisdiction(s) within which an activity is proposed and identify the applicable noise standards. For activities in unincorporated areas, the specific buffers identified in this measure shall apply. For activities in incorporated areas, Midpen shall determine if the standards have a numeric limit and calculate adequate buffers between noise-generating activities and specified land uses (e.g., residential) as appropriate. **Construction Hours** All construction hours identified in the local noise ordinances shall be followed. **Buffer Zones (Santa Clara and Santa Cruz counties)** Buffer zones shall be established to reduce noise at sensitive receptors to the maximum extent feasible to reduce noise to the conditional limits identified by Santa Clara and Santa Cruz counties' noise ordinances. The buffer zone distances are shown below that identify the distances needed for noise levels to remain below 75 dBA L_{eq} for work occurring less than 10 days, and below 60 dBA L_{eq} for work occurring for 10 days or longer in Santa Clara County and below 75 dBA Leq for Santa Cruz County. These distances do not need to be implemented where it is not technically feasible to implement them per the applicable noise ordinances that requires that noise must only be reduced where it is possible to do so (i.e., Santa Clara County Noise Ordinance, or considering the necessity of the work in Santa Cruz County). A violation of the noise ordinances would only occur where the noise exceeded the conditional limits set by the jurisdiction, but there is a feasible way to reduce that noise (e.g., placing a chipper within 50 feet of a receptor when it could feasibly be placed 100 feet away is a violation, but using a chainsaw to cut a large hazard tree within 50 feet of a sensitive receptor would not be a violation assuming no other feasible methods to remove that tree are available).	Midpen and/or Contractor	Midpen	Midpen lands near sensitive receptors.	**Before Activity:** Notify affected parties one week before, if applicable. **During Activity:** (1) A designated coordinator shall ensure that either setbacks or other conditions are implemented or affected parties are properly notified (if setbacks are not feasible) and (2) a buffer shall be maintained between receptor and equipment, if needed and appropriate. **After Activity:** N/A	

Equipment	Approximate Buffer Between Equipment and Sensitive Receptors (feet) – for Work Occurring in One Location for Less Than 10 Days (Not to Exceed 75 dBA L_{eq}) in Santa Clara County or for any work duration in Santa Cruz County	Approximate Buffer Between Equipment and Sensitive Receptors (feet) – for Work Occurring in One Location for 10 Days or Longer (Not to Exceed 60 dBA L_{eq}) in Santa Clara County
Chipper	100	568
Tractor	90	506
Generator/ water pump	71	402
Chainsaw/ excavator	64	358
Skid steer	--	284
Backhoe/ brushcutter	--	254
Fire engine/ crane	--	226
Leaf blower	--	201
Pickup truck	--	179
Power pole saw	--	80

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Minimization Measures and Disturbance Coordinator If these restrictions are not implementable between the receptors and a given location, Midpen shall notify the resident or contact at the sensitive receptor within one week of conducting the activity to schedule the activity. Activities shall be coordinated to minimize disturbance to the receptor, such as conducting the work when no one is there. Engineering controls could also be used, if feasible, to keep noise levels below 75 dBA Leq for work occurring in one location for less than 10 days or 60 dBA Leq for work occurring in one location for 10 days or longer. Midpen shall designate a disturbance coordinator to address any noise complaints under these circumstances. The noise coordinator can be the person performing the work.					
Transportation					
MM Transportation-1: Emergency Responders and Access The following measures shall be implemented to ensure emergency access is maintained: 1. At least one week prior to temporary lane or full closure of a public road, Midpen shall contact the appropriate emergency response agency/agencies with jurisdiction (e.g., CalTrans, County, City) to ensure that each agency is notified of the closure and any temporary detours in advance. 2. In the event of an emergency, roads (public roads, and Midpen-owned or managed roads) or access trails blocked or obstructed by activities shall be cleared to allow emergency vehicles to pass. 3. During temporary lane or road closures on public roads, Midpen shall use flaggers equipped with two-way radios. During an emergency, flaggers shall radio to the crew to cease operations and reopen the public road to emergency vehicles. 4. In work areas, all vehicles and equipment shall be parked so the road is not blocked or obstructed when there is no operator present to move the vehicle.	Midpen and/or Contractor	Midpen	All locations where roads or access trails may be blocked to perform activities.	**Before Activity:** Inform emergency responders of public road closures. **During Activity:** (1) Ensure flaggers and crew are equipped with two-way radios on public roads, (2) clear roads and access trails in the event of an emergency, and (3) park vehicles and equipment so as not to obstruct the roadway. **After Activity:** N/A	