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April 2024

Los Alamos National Laboratory Floodplain Assessment for the Technical Area 72 Outdoor Live Fire Range Fire Fuels Mitigation Project

Los Alamos
NATIONAL LABORATORY

Prepared by: Environmental Protection and Compliance Division,
Stormwater Permitting and Compliance Team
Los Alamos National Laboratory

Prepared for: U.S. Department of Energy
National Nuclear Security Administration
Los Alamos Field Office

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ACRONYMS

AOC	Area of Concern
CFR	Code of Federal Regulations
DOE	United States (U.S.) Department of Energy
EO	Executive Order
ft	feet
IRT	Integrated Review Tool
LANL	Los Alamos National Laboratory
NM 4	New Mexico State Road 4
NNSA	National Nuclear Security Administration
NPDES	National Pollution Discharge Elimination System
TA	Technical Area
U.S.	United States

INTRODUCTION

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the United States Department of Energy (DOE), is proposing a fire fuels mitigation project in lower Sandia Canyon at the Technical Area (TA) 72 Outdoor Live Fire Range and surrounding areas at Los Alamos National Laboratory (LANL). This floodplain assessment is being prepared in accordance with DOE regulations set forth in Title 10 Code of Federal Regulations (CFR) Part 1022, *Compliance with Floodplain and Wetland Environmental Review Requirements* (10 CFR 1022) (CFR 2003). The proposed project is intended to provide wildfire defensible space around existing structures, mitigate wildfire risk in the surrounding area, and improve range safety. The project activities within the Sandia Canyon 100-year floodplain include (1) vegetation maintenance mowing and thinning of the defensible space around the existing building, (2) vegetation maintenance under the existing above ground power line right-of-way, (3) vegetation maintenance along the existing East Jemez Road shoulder firebreak, and (4) vegetation thinning to the west and east of the TA-72 Outdoor Live Fire Range (Figure 1).

The 10 CFR 1022 was promulgated to implement DOE requirements under Executive Order 11988, *Floodplain Management* (EO 1977). A floodplain is defined in 10 CFR 1022 as "the lowlands adjoining inland and coastal waters and relatively flat areas and flood prone areas of offshore islands," and a base floodplain for non-critical actions as "the 100-year floodplain, that is, a floodplain with a 1.0 percent chance of flooding in any given year (CFR 2003)." This floodplain assessment evaluates potential impacts to floodplain values and functions from implementation of the proposed action, identifies alternatives to the proposed action, and allows for meaningful public comment.

DOE/NNSA has published this floodplain assessment for a 15-day public review and comment period. Please provide comments on this floodplain assessment to Karen Armijo at

Email: karen.armijo@nnsa.doe.gov

or

Mail: U.S. Department of Energy
Los Alamos Field Office
ATTN: Karen Armijo
3747 West Jemez Road
Los Alamos, NM 87544

After the close of the public comment period and prior to issuing a floodplain statement of findings, DOE/NNSA will reevaluate the practicability of alternatives to the proposed floodplain action and mitigating measures and take into account all substantive comments received during the public comment period. After issuing a floodplain statement of findings, DOE/NNSA shall endeavor to allow 15 days of public review prior to implementing a proposed floodplain action.

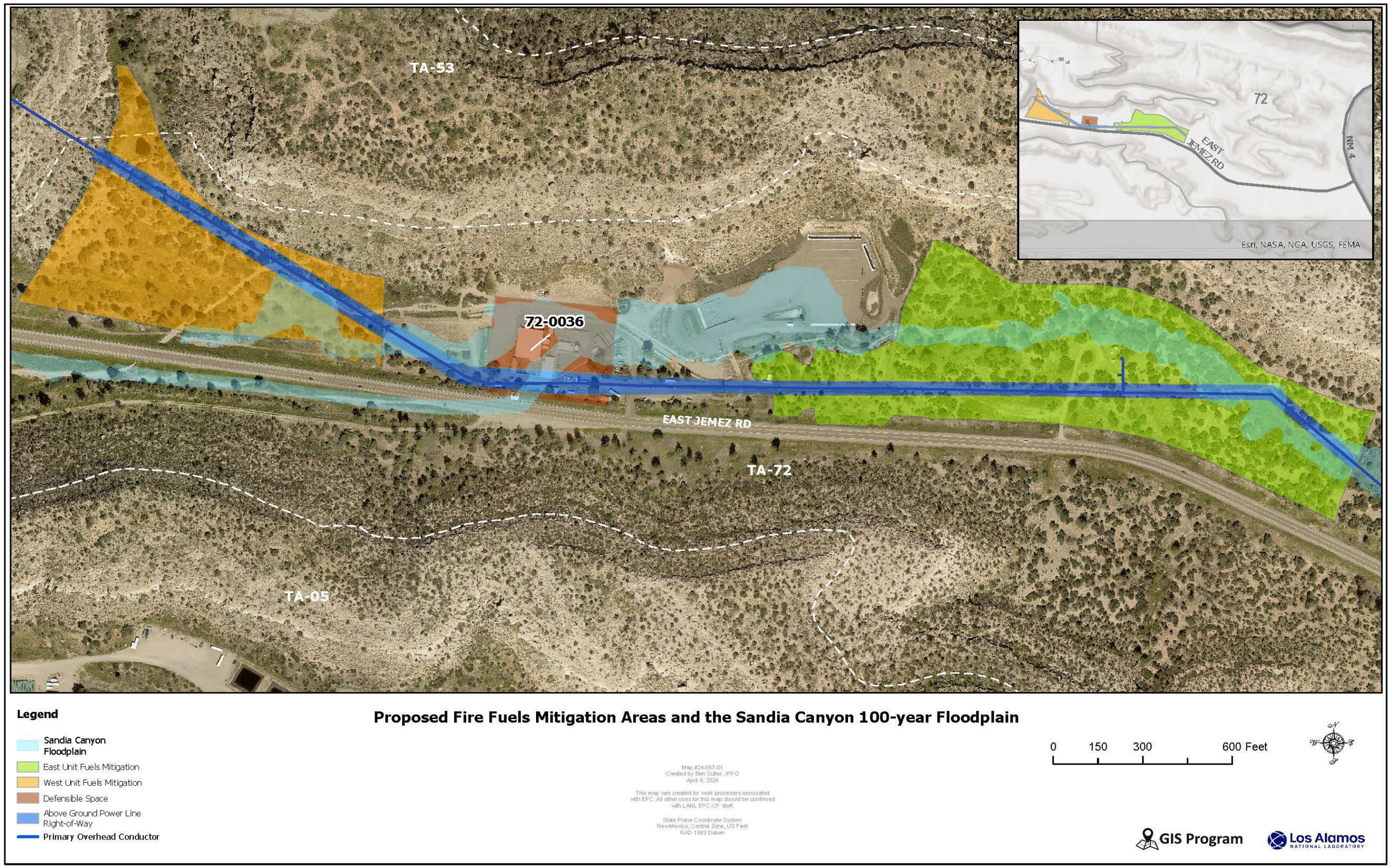

Figure 1. Proposed fire fuels mitigation areas in relation to the Sandia Canyon 100-year floodplain.

BACKGROUND

Wildfire presents a substantial risk to LANL mission-related facilities, surrounding communities, and properties under other agency control (e.g., U.S. Forest Service, Native American pueblos). Many forested areas within the LANL boundary are overgrown, suffer from insect and disease damage, and have numerous standing and fallen dead trees (DOE 2000). General conditions have also changed, including prolonged drought, longer fire seasons, and changes in vegetation. These factors all contribute to an increased risk for high-intensity wildfires. LANL's Emergency Management Division established the Wildland Fire Program to develop wildland fire mitigation and forest health strategies (DOE 2004). The program utilizes wildland fire hazard risk assessments to determine where the greatest wildland fire risks are for life, safety, and property (LANL 2019). Through a hazard analysis, the Wildland Fire Program identified the TA-72 Outdoor Live Fire Range and the canyon bottom west and east of the Range as areas with a high risk for wildland fire.

The TA-72 Outdoor Live Fire Range and adjacent West and East units are located on East Jemez Road approximately 1.5 miles west of New Mexico State Road 4 (NM 4) (Figure 1). Maintenance of vegetation fuels is proposed for the TA-72 Outdoor Live Fire Range around buildings, overhead power lines, and paved roads. The proposed project would review the existing vegetation and then modify or remove vegetation as needed. The goals are to maintain established defensible space around buildings by creating a fuel-limited barrier between wildland fire and the buildings to protect life and property, maintain the vegetation in the overhead power line right-of-way by removing vegetation that may ignite from power line contact or equipment malfunctions, and maintain the established firebreak along East Jemez Road to stop or slow the progress of wildfires and protect personnel in the event that East Jemez Road is used as an evacuation route. The project also proposes to modify vegetation in the West and East units adjacent to the Range to reduce fuel density and improve forest health, which is expected to increase fire resiliency. The proposed reduction in fuel density would also improve line of sight visibility for Range staff to clear potential unauthorized personnel from surrounding areas prior to live-fire activity. These areas are not intended for public use but can be seen from a public road, East Jemez Road. Each element of the proposed project is partially located in the Sandia Canyon 100-year floodplain, which is also the base flood elevation (Figure 1).

The canyon bottom is a mix of developed and relatively undeveloped areas. The Range is developed with paved parking, gravel and dirt access roads, buildings, firing ranges, etc. East Jemez Road, which is developed with culverts and maintained road shoulders, runs along the canyon bottom on the south side of the Range. The relatively undeveloped West and East units are a mixture of ponderosa pine (*Pinus ponderosa*), piñon pine (*Pinus edulis*), one-seed juniper (*Juniperus monosperma*), and Rocky Mountain juniper (*Juniperus scopulorum*) with gambel oak (*Quercus gambelii*) and other shrubs. Only fences, an overhead power line, and dirt two-track vehicle access cross the areas.

PROJECT DESCRIPTION

This assessment focuses on activities occurring in the Sandia Canyon 100-year floodplain that include (1) vegetation maintenance that involves mowing and thinning of the defensible space around the existing buildings, (2) vegetation maintenance under the existing above ground power

line right-of-way, (3) vegetation maintenance along the existing East Jemez Road shoulder firebreak, and (4) vegetation thinning in undeveloped areas to the west and east of the TA-72 Outdoor Live Fire Range (Figure 1).

Building Defensible Space Vegetation Maintenance

The 100-foot (ft) defensible space surrounding buildings 72-0036, -0039 and -0041 has been established in previous years through mowing and selective tree and shrub removal (LANL 2019, NFPA 2013). Defensible spaces at LANL are assessed at least every three years and scheduled for maintenance as needed. The south and east boundaries still contain some larger trees and shrubs (Figure 2). The project proposes to re-evaluate existing vegetation based on the hazard analysis generated for the TA-72 area (LANL 2024). Vegetation selected for removal around the buildings (out to 30 ft) would be removed by mowing grasses and brush with a ride-on mower or trimmer and cutting trees and shrubs to ground level with chain saw, harvester, or feller-buncher. For vegetation 30 to 100 ft from the buildings, all large shrubs and trees would be separated from each other by at least twice the height of the average shrub. Vegetation selected to be removed would be cut at ground level and mechanically masticated or chipped with heavy machinery, and the chipped material would be left on site. Trees and shrubs that are left in place would have ladder fuels, such as low limbs and small shrubs, removed from underneath to a distance of 20 ft from the drip line and pruned with a chain saw to 6 feet from ground level.

Figure 2. Proposed defensible space maintenance area in relation to the Sandia Canyon 100-year floodplain looking west.

Power Line Right-of-Way Vegetation Maintenance

The existing overhead power line and associated right-of-way runs approximately west to east through TA-72 (Figures 3 and 4). Power lines are an important concern because they can serve as an ignition source for wildland fires through equipment malfunctions or damage to lines from falling trees. Utility corridors are assessed at least every five years and scheduled for maintenance as needed. The project proposes to re-evaluate existing vegetation based on the hazard analysis generated for the TA-72 area (LANL 2024). Vegetation 20 ft to each side of the center line of the power line would be cleared of any vegetation taller than 2 feet, excluding grasses. Vegetation with an increased risk for ignition (e.g., piñon, juniper) would be removed from 20-50 ft to each side of the center line. Trees higher than and within the arc of the closest power line and identified as having a risk of falling onto the power line (e.g., dying, dead, diseased, leaning toward the power line) would be removed (LANL 2019). Vegetation selected to be removed would be cut at ground level and mechanically masticated or chipped with heavy machinery, and the chipped material would be left on site.

Figure 3. Proposed overhead power line right-of-way west of TA-72 Outdoor Live Fire Range in relation to the Sandia Canyon 100-year floodplain.

Figure 4. Proposed overhead power line right-of-way east of TA-72 Outdoor Live Fire Range in relation to the Sandia Canyon 100-year floodplain.

Road Shoulder Firebreak Vegetation Maintenance

The road shoulder on the north side of East Jemez Road at the TA-72 Outdoor Live Fire Range is an established firebreak to stop or slow the progress of wildfires. Fire fuel is maintained in a 50-100 ft corridor by mowing (Figure 5). Firebreaks are assessed at least once a year and scheduled for maintenance as needed. The project proposes to re-evaluate several large trees and tree groups still standing along the road for fire hazard compliance and maintenance feasibility based on the hazard analysis generated for the TA-72 area (LANL 2024). Trees selected for removal would be cut to ground level with chain saw, harvester, or feller-buncher and mechanically masticated or chipped with heavy machinery, and the chipped material would be left on site. Trees that are left in place would have ladder fuels such as low limbs removed from underneath to a distance of 20 ft from the drip line and pruned with a chain saw to 6 feet from ground level.

Figure 5. Proposed East Jemez Road firebreak maintenance in relation to the Sandia Canyon 100-year floodplain.

Vegetation Thinning in Undeveloped Areas

The Wildland Fire Program identified the areas to the west and east of the TA-72 Outdoor Live Fire Range as having a high risk for wildland fire. These are open spaces typically in undeveloped areas that do not receive the same vegetation maintenance as the spaces immediately adjacent to structures. The project proposes to modify vegetation in the West and East units to reduce fuel density, improve forest health, and improve line-of-sight visibility for Range staff to clear potential unauthorized personnel from surrounding areas prior to live-fire activity (Figures 6 and 7). Thinning treatments would be used to mimic historical ponderosa pine and piñon/juniper stand conditions where possible by promoting strategies to arrange trees in groups and clumps dispersed by variable openings (Kaufmann et al. 2007, LANL 2024). Depending on existing stand conditions, each group or clump should have a diverse range of age or size classes. Trees and shrubs that are left in place would have ladder fuels, such as low limbs and smaller vegetation, removed from underneath to a distance of 20 ft from the drip line and pruned to 6 feet from ground level.

Vegetation selected for removal would be cut to ground level with chain saw, harvester, or feller-buncher with rubber tires that would reduce ground disturbance. Ladder fuels and smaller shrubs would be removed with a chain saw. Material would be lopped and scattered in areas without established access or mechanically masticated or chipped with rubber-tired heavy machinery.

Material would be spread evenly on the ground to an average depth no more than 4 inches. In areas where cut vegetation has too much volume to masticate or chip in place, the material will either be retained on site for appropriate disposal or approved for release to the public, including transfer to landfills or compost facilities (DOE 2011, LANL 2023).

Figure 6. Proposed West unit in relation to the Sandia Canyon 100-year floodplain.

Figure 7. Proposed East unit in relation to the Sandia Canyon 100-year floodplain.

Dead and dying shrubs and trees throughout the area would be cut at ground level and mechanically masticated or chipped with heavy machinery, and the chipped material would be left on site. Invasive species, such as siberian elm (*Ulmus pumila*), saltcedar (*Tamarix ramosissima*), russian olive (*Elaeagnus angustifolia*), and tree of heaven (*Ailanthus altissima*), would be removed regardless of size or location and stumps may be treated with an herbicide.

FLOODPLAIN IMPACTS

The total proposed project area is approximately 41 acres. The portion of the Sandia Canyon floodplain potentially impacted by this project is approximately 7.24 acres. Potential disturbance would be from the removal of vegetation and from driving heavy equipment, such as harvesters or masticators, through the project area.

Mechanical vegetation removal could cause a short-term decrease in ground cover, which may increase soil erosion. Application of cut or masticated vegetation would provide soil cover and promote vegetation growth.

The project would use existing access roads and paths where possible. To prevent erosion and additional channel-bank collapse, stream channel crossings would be limited to the places existing roads and two-tracks have established crossings. Vehicles and equipment would be staged outside the floodplain. To reduce ground disturbance, areas within the floodplain without established paths will be accessed only with rubber-tired vehicles and machinery. Areas with soil disturbance would be stabilized with cut or masticated vegetation. Any required vegetation stabilization (e.g., seed and mulch) would be completed in accordance with the LANL Seeding Specification (LANL 2021) and the Wildland Fire Programmatic Plan (EPC-CP 2023).

LANL maintains an Integrated Review Tool (IRT) used by LANL subject matter experts to identify, evaluate, and resolve project-specific issues, such as presence of underground utilities, contaminated soils, spills and leaks, soil disturbance and stabilization, threatened and endangered species habitat, floodplains or wetlands, and regulatory agency authorizations, such as U.S. Army Corp of Engineers permit requirements and Clean Water Act permit requirements. The IRT process aids in identifying potential floodplain impacts that may affect natural and beneficial floodplain values and potential effects on lives and property.

Short-Term Impacts

The following requirements were identified and reviewed in the IRT process to avoid potential impacts:

- The project does not propose work in any wetlands within LANL property. No wetland impacts are expected.
- The total project is over 1 acre; therefore, the project will require National Pollution Discharge Elimination System (NPDES) Construction General Permit coverage (CGP). The project is part of the Wildland Fire Programmatic Plan (EPC-CP 2023) which consists of projects that meet the programmatic goals of the Wildland Fire Program to reduce fire risk, implement industry best practices for managing forest land, and enhance

laboratory-wide safety across various project areas. The CGP requires controls to limit soil erosion, sediment loss, and spills and leaks during and after construction. Controls would include temporary perimeter controls to reduce sediment transport during construction, final stabilization to control erosion after construction activities are completed, and pollution-prevention measures such as housekeeping and spill prevention. Any required vegetation stabilization will be completed in accordance with the LANL Seeding Specification (LANL 2021).

- The project will not have any additional requirements for the Energy Independence and Security Act, Section 438. Proposed activities will not result in an increase in impervious surfaces and include stabilization of disturbed areas, including restoring ground cover vegetation in accordance with the LANL Seeding Specification (LANL 2021).
- Per consultation with the U.S. Army Corps of Engineers (Dail 2023), a Clean Water Act Section 404 Dredge and Fill permit or New Mexico State Section 401 Water Quality Certification will not be required for this project (Federal Register 2023) under the following conditions:
    - Project activities must not temporarily stage vegetation, soils, or equipment within the watercourse;
    - Activities must not push soils into the watercourse;
    - Herbicides cannot be applied to vegetation located within the watercourse;
    - Vegetation that has been removed or masticated must not be left in the watercourse; and
    - Heavy equipment must not be used within the stream channel, especially if conditions are too wet to prevent damage to the soil structure.
- Any herbicides that might be applied to invasive tree species within the project area must be registered with the Environmental Protection Agency and New Mexico Department of Agriculture and be applied in accordance with manufacturers' recommendations (LANL 2016). Herbicides may not be applied to vegetation in a water course. The project must coordinate with LANL Water Quality staff to ensure compliance with the 2021 NPDES Pesticide General Permit (EPA 2021). The project must also coordinate with LANL Environmental Stewardship staff to ensure compliance with biological resource regulations and the National Environmental Policy Act (NEPA 1970).
- Based on LANL surveys and procedures, archeological resources are located within or within 100 ft of the proposed thinning areas. To ensure compliance with the National Historic Preservation Act and LANL's cultural heritage management plan, prior to the start of any activities, a completed survey, site updates, site flagging for visibility and avoidance, and a walk down with project personnel must be performed by the Cultural Resources Program (LANL 2017). Should thinning be required within a site boundary, a Cultural Resources monitor must be present. Only hand tools are allowed within the flagged boundary and vegetation cannot be dragged across the surface. The project must follow the proper procedure for inadvertent discoveries.

- The proposed project is not located in threatened- or endangered-species habitat based on LANL surveys and procedures; therefore, no impacts are anticipated to occur to current listed species in the Los Alamos County area.
- The proposed project for fuels mitigation in open spaces and near buildings is covered under the Final Supplemental Environmental Assessment for the Wildfire Hazard Reduction and Forest Health Improvement Program at Los Alamos National Laboratory (DOE 2019) and its associated Finding of No Significant Impact issued on July 17, 2019.
- The proposed project will involve minimal disturbance of the Sandia Canyon Area of Concern[1] (AOC) C-00-007, AOC C-20-002, AOC C-20-003, AOC 20-003(b), AOC 72-0001, or AOC 72-003(a) (Figure 8). Any disturbed soil from the AOCs would be managed on site and stabilized using LANL-approved best management practices. The project is required to take precautions to avoid inadvertently transporting potentially contaminated soil from the site. If any soil is removed from the AOC, it must be managed, characterized, and disposed of in accordance with the LANL Waste Management Procedure P409 (LANL 2022).

The Sandia Canyon AOC C-00-007 occupies the same footprint as the Sandia Canyon 100-year floodplain. The 100-year floodplain represents the extent to which post-Lab aged sediments and contaminants could have been deposited and therefore, is used to delineate the extent of the AOC. AOC C-20-002 was the former location of a storage structure possibly used for high explosives. AOC C-20-003 was the former location of a high explosives storage structure. All structures were removed. The locations of the former structures are north of East Jemez Road and west of the TA-72 Outdoor Live Fire Range. Their current status is No Further Action Approved. AOC 20-003(b) was the former location of a 20-milimeter gun-firing site and two small buildings. All structures were removed. The site is pending receipt of a Certificate of Completion without Controls. AOC 72-0001 is an active small-arms firing and training range used by the LANL security force and has operated as a live-fire range since 1966. AOC 72-003(a) is an active sanitary septic system that has served an office building since 1989. The structures include a septic tank, leach field and connecting inlet/outlet drain lines. The current status is No Further Action Approved. AOC contaminants of potential concern are summarized in Table 1. Existing sampling data can be viewed by the public on the Intellus website (http://www.intellusnm.com).

[1] An AOC is any area having a known or suspected release of hazardous waste or hazardous constituents that is not from a solid waste management unit and that the Secretary of the New Mexico Environment Department has determined may pose a current or potential threat to human health or the environment.

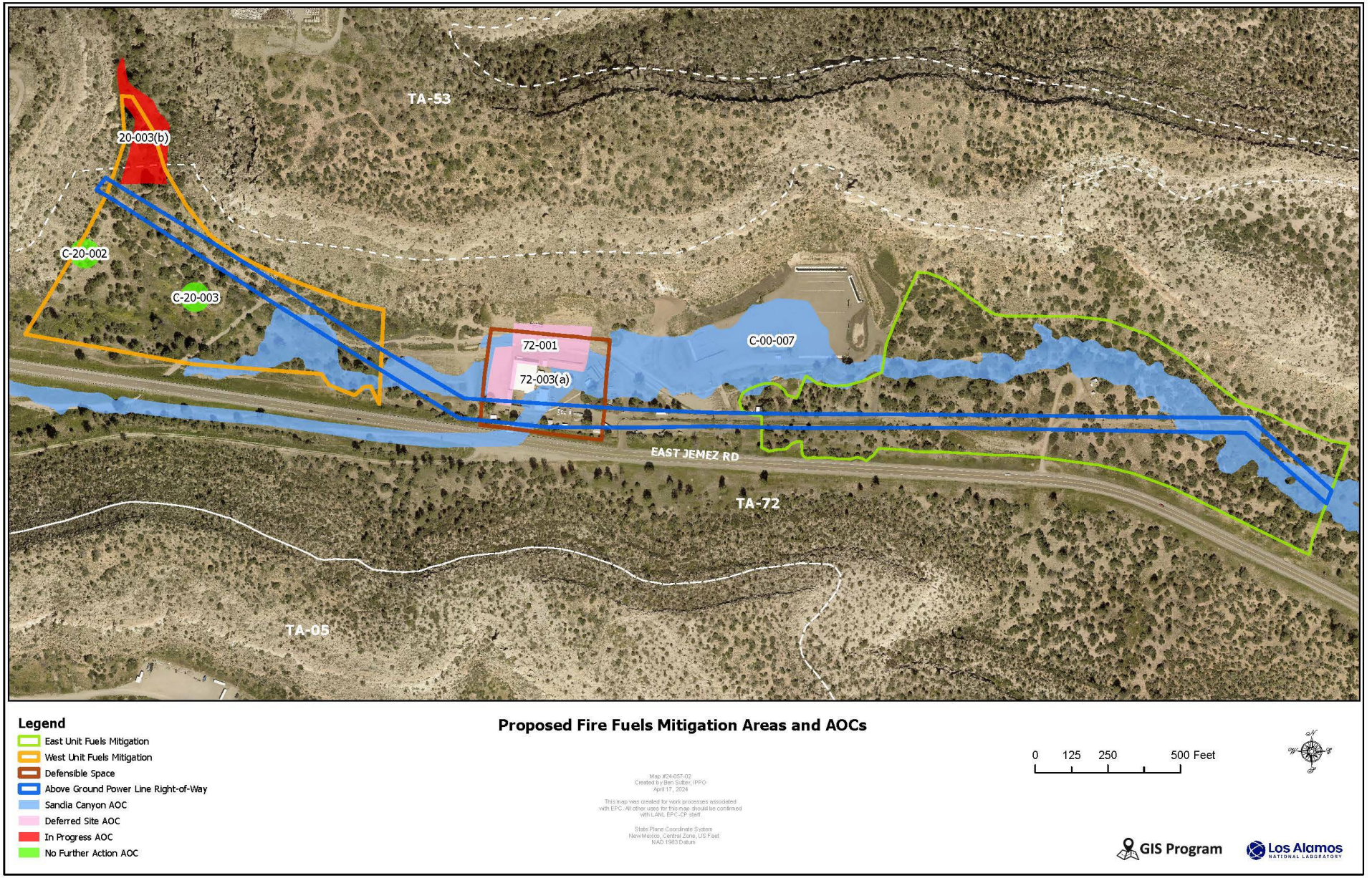

Figure 8. Proposed fire fuels mitigation areas in relation to AOCs.

Table 1. AOCs potentially impacted by project activities.

AOC	Description	Contaminants of Potential Concern
C-00-007	Sandia Canyon system	Organic chemicals, inorganic chemicals, radionuclides, PCBs
C-20-002	Storage building	N/A (No Further Action Approved)
C-20-003	Storage building	N/A (No Further Action Approved)
20-003(b)	Former 20-mm gun firing site	Inorganic chemicals
72-001	Small arms firing and training range	Inorganic chemicals
72-003(a)	Active sanitary septic system	N/A (No Further Action Approved)

Soil is not expected to be removed from the AOCs as a result of fuel mitigation activities. The project proposes to keep all disturbed soil on site, returned to its point of origin, and stabilized in place (LANL 2021). Any soil removed from the AOC from excavation must be disposed of in accordance with the LANL Waste Management Procedure P409 (LANL 2022).

Potential short-term direct and indirect floodplain impacts from release of pollutants to the floodplain and exposure to stormwater would be avoided or minimized through implementation of best management practices, as specified in the LANL Engineering Standards and include the following (LANL 2015):

- Hazardous materials, chemicals, fuels, and oils will not be stored within the floodplain.
- Heavy equipment will not be used within the stream channel, especially if conditions are too wet to prevent damage to the soil structure.
- Equipment will be refueled at least 100 ft from the Sandia Canyon floodplain.

Potential direct effects to migratory birds and other biological resources are minimal because little habitat would be disturbed. The Migratory Bird Treaty Act prohibits killing migratory birds, including nestlings and eggs in an active nest. Therefore, if vegetation removal is required, during the nesting season (May 15 through July 15), an onsite inspection for bird nests from LANL Biological Resource subject matter experts would be required. Installation activities would conform to requirements stipulated in the Migratory Bird Best Management Practices Source Document for Los Alamos National Laboratory (LANL 2020).

Long-Term Impacts

No negative long-term impacts to the floodplain are anticipated as a result of this project. Flow paths within the floodplain would have little to no modification from pre-project conditions to post-project conditions.

This assessment considered the impacts of the proposed actions in the floodplain on the conservation of habitat for existing flora and fauna. The proposed action would not remove any protected habitat. Open space treatments designed for forest health are expected to improve habitat in the long-term. These treatments are designed to create conditions consistent with historic ecological conditions, improved health and increased ecological diversity of wildlife

habitats (Kaufmann et al. 2007). Tree thinning would promote vegetation growth and decrease soil erosion. Defensible space, utility corridor, and fire break maintenance are ongoing maintenance activities that decrease fuel sources and reduce the overall risk for starting and spreading a wildland fire that may burn habitat for flora and fauna (LANL 2019).

This assessment also considered the impacts of the proposed actions in the floodplain on aesthetic values and public interest. The proposed action's impact to cultural resources is expected to be minimized through engaging the LANL Cultural Resources Program. The proposed action is not considered to negatively impact aesthetic values or public interest because the proposed action will occur in areas that are not accessible to the public and partially in areas that have been previously disturbed.

ALTERNATIVES

The alternatives available to DOE/NNSA include the no action alternative. The no action alternative was not selected by DOE/NNSA because changing forest and climate conditions have increased the risk for wildfires, which may endanger LANL personnel and mission-related facilities in addition to surrounding communities and areas under other agency control (e.g., U.S. Forest Service, Native American pueblos, etc.). Under this alternative, fire fuels would continue to increase. The no action alternative would also allow an existing safety risk to continue. The TA-72 Outdoor Live Fire Range safety sweep personnel would not have good line of sight to clear potential unauthorized personnel from surrounding areas before live-fire activity.

Other alternatives considered but not selected are (1) clear cutting, (2) large-scale application of herbicides, and (3) thinning all areas in the canyon bottom, excluding the floodplain.

Clear cutting would reduce the fuel load but increase soil erosion and the potential for historical soil contaminates to migrate off site. Local wildlife would also have large impacts from habitat removal. Large-scale application of herbicides would carry a high risk of exposing workers and local residents to the herbicides. Dead vegetation would not be removed, increasing the fuel load and potential for wildfire. Vegetation thinning in the project area, excluding the floodplain, was not selected because it does not meet wildland fire hazard analysis minimum-reduction-of-fire-fuels requirements to effectively reduce potential wildfire. Fire fuels would continue to increase in the floodplain.

CONCLUSIONS

The proposed project would result in limited and minor direct and indirect impacts to the Sandia Canyon 100-year floodplain and would not result in adverse impacts to the floodplain values or functions. The proposed project also would not change the flood hazard rating. Temporary disturbance within the floodplain would cease following completion of fire fuel mitigation activities. Best management practices would be implemented to mitigate impacts during activities. This proposed project would not significantly modify flow paths within the floodplain from pre-project conditions to post-project conditions. No effects are anticipated to lives and property associated with floodplain modifications.

In accordance with 10 CFR 1022, DOE/NNSA will publish this floodplain assessment and initiate a 15-calendar-day public comment period. DOE/NNSA will take into account all substantive comments received on this floodplain assessment and, prior to implementing the proposed action, provide the Statement of Findings on the proposed floodplain action.

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As directed by:

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40 CFR, *Protection of Environment*

48 CFR, *Federal Acquisition Regulations System*

49 CFR, *Transportation*

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