Enclosure 1

Transmittal of the Floodplain Assessment for the TA-72 Outdoor Live Fire Range Upgrades and Channel Stabilization Projects

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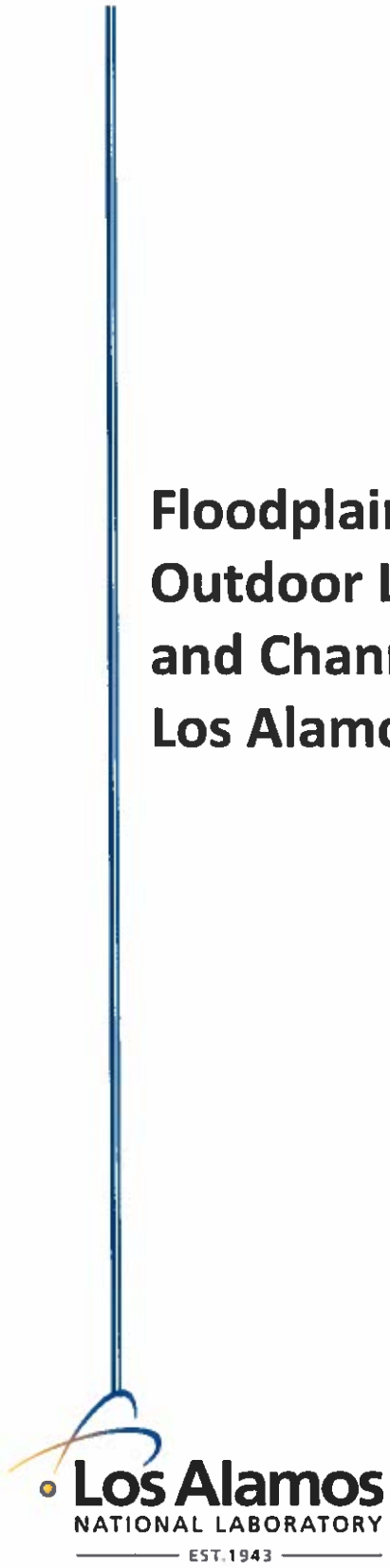
Floodplain Assessment for TA-72 Outdoor Live Fire Range Upgrades and Channel Stabilization Projects at Los Alamos National Laboratory



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

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ACRONYMS

CAP	Corrective Action Plan
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EISA	Energy Independence and Security Act
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security
NNSA	National Nuclear Security Administration
NPDES	National Pollutant Discharge Elimination System
TA	Technical Area
TRM	Turf Reinforcement Matting
USACE	United States Army Corps of Engineers

INTRODUCTION

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the U.S. Department of Energy (DOE), is proposing new construction activities in lower Sandia Canyon at Technical Area (TA)-72 at the Outdoor Live Fire Range facility within Los Alamos National Laboratory (LANL), New Mexico. This proposed action would include the construction and use of a new warehouse, new sanitary holding tank, range upgrades, a new dual-purpose shooting range with access roads, and streambed channel corrective actions within the 100-year floodplain. The purpose of this proposed construction is to provide improved and expanded training facilities for LANL security services, reduce potential damage to facilities from flood events, and mitigate streambed channel erosion.

NNSA has prepared this floodplain assessment in accordance with 10 Code of Federal Regulations (CFR) 1022 *Compliance with Floodplain and Wetland Environmental Review Requirements*, which was promulgated to implement DOE requirements under Executive Order 11988 *Floodplain Management*. According to 10 CFR 1022, a floodplain is defined as "the lowlands adjoining inland and coastal waters and relatively flat areas and flood prone areas of offshore islands," and a base floodplain as "the 100-year floodplain, that is, a floodplain with a 1.0 percent chance of flooding in any given year." 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.

BACKGROUND

The proposed project area has had a firing range on site since the 1950's. During this time, the firing range has evolved with several improvements made to facilities and stormwater management. Proposed range upgrades will help fulfill mission requirements to ensure armed Protective Force personnel are trained and qualified to protect the LANL workforce and operations as required by: DOE Order 470.3B *Graded Security Protection (GSP) Policy;* DOE Order 470.4B *Safeguards and Security Program, Admin Change 1;* DOE Order 473.3 *Protection Program Operations;* and, the LANL Site Safeguards and Security Plan.

Stormwater Management History

In 2012, DOE/NNSA installed a concrete channel to address flooding at the Fire Range facility (LANL 2012b). Under this action, the main channel that runs through the center of the outdoor live fire range was hardened and deepened, and an energy dissipater was constructed just downstream from the channel modifications (Figures 1 and 2).

The concrete channel project was authorized by the U.S. Army Corps of Engineers (USACE) under the Nationwide Dredge and Fill Permit 38. On February 14, 2018, the USACE issued a Notice of Non-Compliance to Los Alamos National Security, LLC (LANS) indicating that the energy dissipation structure failed and the site is eroding.

As a result, LANS was required to submit a corrective action plan (CAP) to the USACE by July 1, 2018 to address streambank and channel erosion issues downstream from the dissipation

structure. The CAP was submitted to the USACE on June 28, 2018 and was approved on July 30, 2018. Actions under the CAP are described later in this document.

Proposed Shooting Range Upgrades Background

Some of the facility upgrades evaluated in this floodplain assessment were originally proposed and analyzed in a floodplain assessment released for public comment in May 2018 for the "Outdoor Fire Range Upgrades Project" (LANL 2018). However, a subsequent USACE firing range safety assessment determined that there was a potential risk for ricochet or stray bullets between firing lines. This determination has resulted in a significant redesign of the dual purpose firing range prior to construction. The new scope of facility upgrades are described in this document. Due to the significant change in scope of the project, this floodplain assessment supersedes the May 2018 floodplain assessment and statement of findings.

PROJECT DESCRIPTIONS

The proposed 2018 shooting range upgrade activities are detailed below. Brief descriptions of other projects in the nearby area are also provided to list all reasonably foreseeable actions occurring within the floodplain.

Proposed 2018 Shooting Range Upgrades

The proposed activities include construction of one new warehouse and a new sanitary holding tank outside of the new warehouse (both dependent on funding), a new dual purpose shooting range with access roads, and stormwater controls, much of which are within the 100-year floodplain (Figure 1).

Facilities

Warehouse Construction: A 2400-ft^2 warehouse and sanitary holding tank are proposed for construction just south of the Range 2 Shoot House and west of Building 39, a developed area surrounded by other structures (Figure 1 and Photograph 1). This facility will be used for storage of targets, supplies, and other consumables that are currently stored in metal temporary storage containers. These containers will be removed from the site once their contents have been transferred to the warehouse. No hazardous materials will be stored in the new warehouse.

A restroom planned for construction in the new warehouse will drain into a new sanitary holding tank. The tank will be pumped periodically and the waste transported off site. The tank lid is designed to seal the contents inside and eliminate the risk of floodwaters mixing with tank contents.

The proposed warehouse and holding tank will be partially located within the floodplain boundary delineated prior to the concrete channel construction. The concrete channel and maintenance on an upstream culvert have significantly reduced the risk of flooding near the buildings in this area (Figure 1).

Shooting Range Upgrades: Plans include improvements to the stormwater drainage system around new and existing buildings, and a new system of underground drains associated with Shoot House 2 to route water into the channel and thereby prevent flooding and standing water.

Upgrades to the shooting range will also include development of a new dual purpose firing range—Ranges 5A and 5B (Figure 1).

- Range 5A will be approximately 80-ft wide by 600-ft long. Construction will include a 10-ft high by approximately 80-ft long earth berm to protect the firing line from ricochet. Other Range 5A construction includes overhead noise suppression baffles supported by poles in front of the firing line, an 8-ft high by 100-ft long concrete block shield wall along the south side of the firing line to prevent shooting toward and damaging the Range 5B firing line,, an earth berm behind the target line, and a short "knee" wall in front of the target line to protect the target mechanisms (Figure 1).
- Range 5B will be 160-ft wide by 300-ft long and include a 160-ft long earth berm behind the target line and a knee wall to protect the target mechanisms (Figure 1). A new lighting system will be installed for both ranges. Knee walls and target line berms on both ranges are all outside of the 100-yr floodplain.

New access roads (20-ft wide) will be constructed around Range 5A and 5B. The existing roads and parking area south of the main channel, plus the new access roads and Ranges 5A and 5B will all be covered with asphalt millings or base course for stabilization and dust suppression. Road construction and range stabilization will include clear and grub, level and grade, installation of weed barrier and application of 3 inches of cold millings at 90% compaction (or application of base course). The asphalt millings surface (approximately 3.1 acres) will be semi-pervious (Figure 1 and Photograph 2). Storm water controls will be installed to manage runoff from impervious and semi-pervious surfaces (described in the following Stormwater Controls section).) No asphalt millings or base course will be placed within the main channel.

Stormwater Controls

A system of stormwater controls, including swales, 3 culverts, and 4 detention basins will be installed to meet National Pollutant Discharge Elimination System (NPDES), Energy Independence and Security Act (EISA) 438, and USACE 404 requirements (Figure 2). The goals of these requirements are to reduce erosion and stormwater and sediment discharge to the main channel. The culverts and detention basins will be sized to accommodate, at a minimum, an estimated 25-yr/24-hr storm event.

Approximately five to ten ponderosa pine trees as well as other shrubs and brush in the area (Figure 1) will be removed to avoid potential damage to infrastructure, injury to personnel, or they are located within one of the proposed ranges. All disturbed areas will be stabilized per LANL requirements (described in the following Floodplain Impacts section).

Figure 1. TA-72 Proposed Site Plan in relation to the 100-year floodplain.

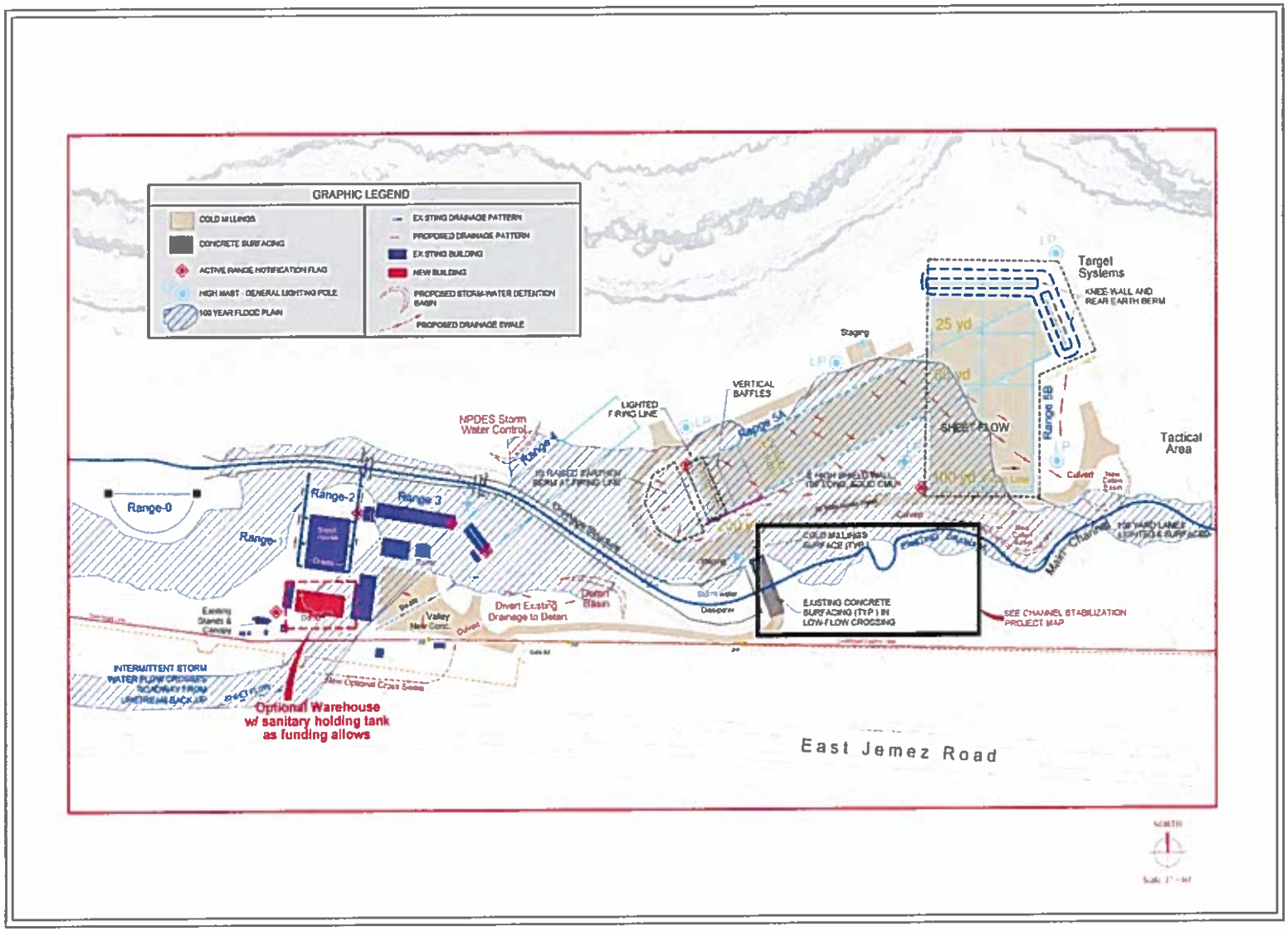

Figure 2. TA-72 Proposed Site Drainage Plan in relation to the 100-yr floodplain.

Photograph 1. Proposed location of the new warehouse and sanitary holding tank.

Photograph 2. Looking northeast down Range 5A.

Photograph 3. Looking north down Range 5B.

Proposed USACE Corrective Action Plan Project

The objective of the USACE CAP project is to enhance channel stability and correct erosion damage and channel degradation in an approximately 300-ft section within and downstream of the project area (Figures 1 and 2). The channel currently flows out of the storm water dissipater structure and is routed into a sharp horseshoe bend (Figure 3). The banks of the horseshoe bend are collapsing and eroding because flow in the channel is being forced into a 90° turn (Photograph 5). The CAP project will straighten approximately 45 feet of the channel, stabilize the banks, and install rock check dams to dissipate energy, raise the channel bed, and accommodate flows.

Key actions of the USACE CAP project include:

- Remove accumulated sediment from the existing concrete low flow channel crossing located at the dissipation structure outlet (Figure 3).
- Restore the channel at the dissipation structure outlet to original contours and ensure a positive grade. Use high-performance turf reinforcement mat (TRM) to stabilize the channel bottom.
- Remove the existing gabion basket adjacent to the channel bank, lay back the existing channel bank to a minimum of 2:1 slope, and stabilize the channel bank with seeding and TRM (Photograph 4).

- Install a series of five check dams in the main channel designed to reduce flow velocity, direct flow away from channel banks, and trap sediment.
- Eliminate a small horseshoe bend and establish a new straight channel section to reduce bank erosion.
- Ensure effective transition between the existing and new channel sections.
- Fill the abandoned horseshoe bend channel section with non-vegetative fill material removed for construction of the new channel section; and then, contour the area to match existing grade.
- Restore all disturbed areas to original grade and reseed with native perennial species.

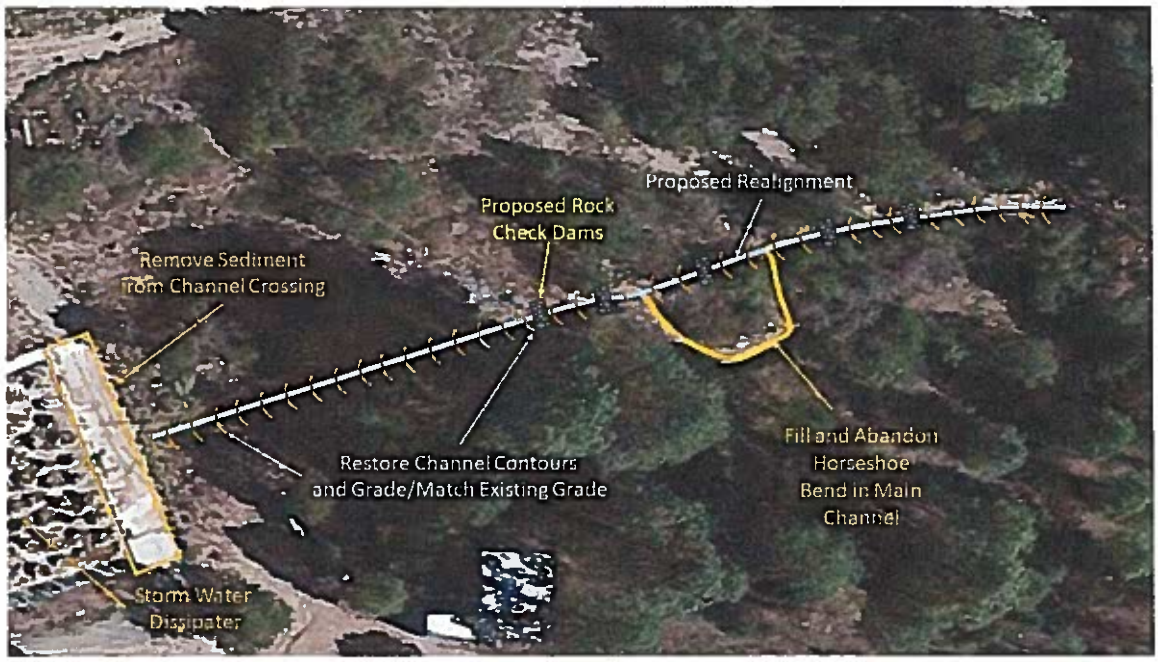

Figure 3. Channel Stabilization Project Map. This project will stabilize the main channel directly downstream of the dissipation structure, straighten the channel and fill in the sharp bend, line the bank and channel bottom with TRM, and install 4-5 rock check dams.

Photograph 4. The channel below dissipation structure will be restructured and the gabion removed.

Photograph 5. View of channel degradation and erosion in the sharp bend.

Related Projects

Lower Sandia Watershed Controls Project: The Lower Sandia Watershed Controls Project is located in TA-72, less than a mile downstream from the Outdoor Fire Range/CAP Projects. The Floodplain Assessment (LA-UR-17-30209 Floodplain Assessment for the North Ancho and Lower Sandia Controls Supplemental Environmental Projects at Los Alamos National Laboratory) for this project was released for comment November, 2017 with a subsequent statement of findings posted online at www.energy.gov. This project was designed to reduce the velocity of flooding events and trap sediment moving down the channel. NNSA determined that this project would not result in long-term adverse impacts to the beneficial values of the 100-year floodplain.

Ongoing Maintenance: A large culvert in the main channel approximately 1,300-ft upstream of the Live Fire Range was recently cleaned out and can now accommodate the 100-year flood event (approximately 475 cfs). Previously, larger storm events would back up behind the culvert and flood facility buildings from the south. To meet the requirements of the LANL NPDES Individual Permit program, a 2-ft high by 80-ft long earth berm will be installed just north of Range 4. Both activities will help to control stormwater and reduce impacts to the floodplain.

FLOODPLAIN IMPACTS

Activities associated with the proposed and related projects would involve work within the 100-yr floodplain. The following floodplain impact assessment discusses the positive and negative, direct and indirect, and long- and short-term effects of the proposed projects on the floodplain. The related projects should have no impact on the proposed projects, however, the Lower Sandia Watershed Controls Project does act as a backup stormwater control for flood events in the proposed project area.

Short-term Impacts

Short-term direct impacts to the floodplain from these projects include ground disturbance during construction of 1) a 2400 ft^2 warehouse and sanitary holding tank, 2) range improvements including access roads and placement of asphalt millings or base course, the Range 5A firing line baffles, and an 80-ft earth berm and 100-ft concrete block wall, 3) stormwater control features including swales and detention basins, and 4) USACE CAP channel stabilization features.

Short-term indirect impacts to the floodplain from these projects include potential soil erosion from ground disturbance associated with construction activities and potential spills or leaks (fuel, oil, hydraulic fluid) that could occur during construction activities; however, these indirect impacts will be prevented by permit process controls as discussed below.

All ground-disturbing activities at LANL are required to obtain an excavation permit. This permitting process evaluates potential issues such as underground utilities, contaminated soils, threatened and endangered species impacts, impacts to floodplains or wetlands, and specific permit requirements. During review of this project, the following controls were identified as required for this project:

- NPDES Construction General Permit coverage, which requires controls to limit soil erosion, sediment loss, and spills and leaks during and after construction. Controls include temporary perimeter controls to reduce sediment transport during construction and final stabilization (described in the Mitigations section) to control erosion after construction activities are completed.
- EISA Section 438 coverage, which requires that Federal projects manage stormwater runoff to pre-disturbance levels. The storm water controls identified in the Preliminary Site Drainage Plan (Figure 2) will be designed and installed to meet these short- and long-term storm water requirements.

Short-term direct and indirect impacts from project activities will be mitigated through implementation of the following LANL best management practices for construction work in floodplain:

- Disturbed areas associated with the project will be revegetated or stabilized to meet requirements of the NPDES Construction General Permit, which states that projects must "establish uniform, perennial vegetation that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas." Stabilization must be initiated immediately following completion of construction activities and installation completed within 7 days. Revegetation activities will follow internal LANL procedures.
- Hazardous materials, chemicals, fuels, and oils will not be stored within the floodplain.
- Work in a floodplain will not take place when the soil is too wet to adequately support equipment.
- Equipment will be refueled at least 100 feet (30m) from any drainage, including dry arroyos.

Long-term Impacts

Long-term direct and indirect impacts to the floodplain under the proposed projects include: changes in channel morphology, reduced surface infiltration, and change in flood storage volume. The USACE CAP project will straighten the channel and could result in increased flow velocities through this area; however, this will be mitigated by the installation of rock check dams and the eventual increase in grade as the rock check dams fill with sediment. Other positive long-term potential impacts from channel improvements include a stabilized channel bed and side slopes, and reduced channel erosion and sediment transport. Construction of the warehouse, berms, ranges, and access roads with asphalt millings or base course will increase elevations that could alter the floodplain topography and flow paths, potentially resulting in negative long-term impacts such as reduced surface infiltration. Application of asphalt millings or compacted base course will increase the amount of semi-pervious surface and increase storm water runoff; however, storm water controls will be designed and installed to manage this additional water before it reaches the main channel and minimize its effects. Storm water runoff from areas with compacted asphalt millings is expected to be similar in chemical composition to runoff from roads and parking lots and not add additional hazardous constituents to surface waters.

Positive long-term, direct and indirect impacts to the floodplain are associated with decreasing the potential for erosion because of stormwater controls and the USACE CAP project. In addition, upstream culvert maintenance activities will reduce the risk of flooding to the Live Fire Range. The Lower Sandia Watershed Controls Project will provide additional channel stabilization downstream of the project area. Although some floodplain elevations will change, the proposed changes will not obstruct rising floodwater. With the exception of proposed activities in the channel, changes to the existing slope within the floodplain are expected to be minimal, and not increase surface water velocities from the floodplain to the channel. This area does not receive run-on water from upstream facilities or drainages, other than minor sheet flow from the surrounding canyon walls.

Compliance with the Migratory Bird Treaty Act restricts vegetation removal during the peak bird breeding season, May 15 through July 31, unless biological resources staff at LANL have conducted a nest check to ensure that there are no nesting birds present. If active nests are found, the nest tree or shrub will be left in place until the nesting is complete.

Effects of the proposed action on the floodplain considered conservation of habitat for existing flora and fauna, cultural resources, aesthetic values, and public interest. The proposed action may remove potential habitat, yet disturbed soil will be revegetated with native species in order to minimize any habitat loss. The proposed action will not impact cultural resources because it does not involve ground disturbing activities near cultural resource sites. The proposed action is not considered to negatively impact aesthetic values since it will occur in areas that have been previously disturbed.

The floodplain identified within the proposed action is entirely located within LANL property, and uninhabited by people beyond facility personnel; and, it is undeveloped beyond the live firing range facilities, equipment, and infrastructure. No impacts to lives or private property associated with floodplain disturbance are anticipated from these projects.

ALTERNATIVES

Shooting Range Upgrades Project Alternatives

An earlier version of the Shooting Range Upgrade Project was considered in 2017. Range 5A and 5B were combined into a single 300-yd range with the firing line located south of the main channel. No negative, long-term floodplain impacts were identified for this project, although a USACE safety assessment recommended changes (e.g. separate ranges rather than a combined range) that were incorporated into the current proposed design.

Other locations for the warehouse and sanitary holding tank were considered, but TA-72 has space limitations and the proposed location was chosen because it was a cleared site, close to other buildings, and protected from the main channel.

The only other alternative evaluated for the Shooting Range Upgrade Project was a no action alternative. Compliance with safety and security requirements that necessitate a shooting range is mandatory, thus a no action alternative was not selected.

USACE Corrective Action Plan Project Alternatives

Several options were considered for the USACE CAP project including different methods for stabilizing channels and banks (TRM vs rip rap), number, size and position of rock check dams, new channel configurations, etc. The current design minimizes the initial ground disturbance and establishes long-term stability.

CONCLUSIONS

The proposed projects will result in both short and long-term, direct and indirect impacts to the 100-yr floodplain; however, all impacts will be minimized and mitigated through the use of storm water controls throughout the project area. Modifications to the 100-yr floodplain include minimal increased elevations and alterations of flow paths associated with construction and surfacing of the new firing ranges and access roads, and modifications to the stream channel to improve drainage from the area and potentially reduce frequency of flooding. Temporary disturbance within the floodplain will cease following completion of construction activities associated with these projects. Storm water discharge into the main channel from the ranges, and erosion within the main channel, will be reduced by these storm water controls. No impacts to lives and private property are anticipated from this floodplain modification project. The proposed project reduces flooding risk to existing structures because site drainage will be improved. Recent flooding was caused by a backup at the upstream culvert, which has since been cleaned out. Minor flooding during a major storm in 2013 is not expected to occur again, because the concrete channel was designed and constructed to mitigate facility flooding.

DOE/NNSA will publish, in accordance with 10 CFR 1022, a Statement of Findings that will include a brief description of the proposed project, an explanation of why it is located in a floodplain, the alternatives considered, a statement indicating if the action conforms to state and local floodplain requirements, and a brief description of the steps to be taken to minimize potential harm within the floodplain. After publication of its Statement of Findings, a 15-day public review period is required before implementing the proposed action. The Statement of Findings will be posted online and available for public review. DOE/NNSA will take into account all substantive comments received on this Floodplain Assessment and, in accordance with 10 CFR 1022 and prior to implementing the proposed action, provide the Statement of Findings to state, tribal and local governments and others who submitted comments on the proposed floodplain action.

LITERATURE CITED

LANL (Los Alamos National Laboratory) 2012a. "Floodplain Assessment for the Proposed Outdoor Fire Range Upgrades at TA-72 in Lower Sandia Canyon, Los Alamos National Laboratory." Los Alamos National Laboratory report LA-UR-12-23681.

LANL (Los Alamos National Laboratory) 2012b. "Floodplain Assessment for the Proposed Engineered Erosion Controls at TA-72 in Lower Sandia Canyon, Los Alamos National Laboratory." Los Alamos National Laboratory report LA-UR-12-24060.

LANL (Los Alamos National Laboratory) 2018. "Floodplain Assessment for the TA-72 Outdoor Fire Range Upgrades at Los Alamos National Laboratory." Los Alamos National Laboratory report LA-UR-18-23647.