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Title:	Lower Sandia Canyon Floodplain Assessment for the New Mexico State Route 4 and East Jemez Road Intersection and Technical Area-72 Shooting Range Facility at Los Alamos National Laboratory
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Lower Sandia Canyon Floodplain Assessment for the New Mexico State Route 4 and East Jemez Road Intersection and Technical Area-72 Shooting Range Facility at Los Alamos National Laboratory

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NATIONAL LABORATORY
EST. 1943

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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
NNSA	National Nuclear Security Administration
NPDES	National Pollutant Discharge Elimination System
TA	Technical Area
TRM	Turf Reinforcement Matting

INTRODUCTION

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the U.S. Department of Energy (DOE), is proposing to take actions within the lower Sandia Canyon floodplain. These activities consist of modifications and upgrades to the intersection of New Mexico State Route 4 (SR4) and East Jemez Road and installation of a 4-wire fence and a prefabricated bridge at the Technical Area (TA)-72 Shooting Range Facility. The purpose of the proposed modifications and upgrades is to improve safety and increase the capacity and efficiency of the intersection. Road and intersection upgrades will add extra lanes to both SR4 and East Jemez Road in the vicinity of the intersection and will require widening both roads. Widening East Jemez Road will encroach on the 100-year (100-yr) lower Sandia Canyon floodplain.

In support of recent modifications and upgrades to the TA-72 Shooting Range Facility the installation of a 4-wire fence and a prefabricated bridge are necessary. Both the fence and bridge cross the lower Sandia Canyon channel and floodplain east of the shooting range.

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 United States Army Corps of Engineers commissioned a traffic study of the intersection which concluded that improvements to the intersection were needed to reduce delays and provide capacity for future growth (3AEGREEN, 2018). The intersection is located primarily on LANL property, on the south boundary of TA-72. A portion of the project is on the north border of the Tsankawi Ruins portion of Bandelier National Monument and is managed by the National Park Service (Figure 1). The Sandia Canyon drainage runs northwest to southeast and crosses under East Jemez Road approximately 100ft west of the intersection and then under State Route 4 approximately 500ft south of the intersection. The 100-yr floodplain associated with Sandia Canyon is located in the NW and SW quadrants of the intersection.

The TA-72 Shooting Range Facility needs to improve and expand the perimeter boundary to the east. A new 4-wire fence will be installed with Surface Danger Zone beacons and signage. In addition, the facility intends to install a 10-ft by 30-ft pre-fabricated bridge across the main channel to prevent bank and channel disturbance. Both features will be within the Sandia Canyon 100-yr floodplain (Figure 2).

Stormwater Management History

Sandia Canyon enters the intersection project area from the northwest and crosses under East Jemez Road approximately 100ft west of the intersection. The 100-yr floodplain backs up behind a culvert and overtops the road at a low point further west (Figure 1, Photos 1 and 2). The culvert is an 18.25ft by 7.5ft multi-plate arch culvert that is partially filled with sediment (Photo 3). Below the culvert, the floodplain follows the channel for approximately 0.25 miles and then runs under SR4 to the east (Photos 4 and 5).

The proposed 4-wire fence east of the shooting range will cross the floodplain in an area dominated by pinon-juniper woodland with no definitive channel (Photo 6). The pre-fabricated bridge (Photo 7) will cross the channel just upstream of an existing chain-link perimeter fence (Photo 8).

PROJECT DESCRIPTION

A second eastbound turn lane will be added to East Jemez Road. A second northbound through lane will be added to State Route 4 along with right and left turn bays to the proposed Tsankawi trailhead parking lot. Acceleration and deceleration lanes will be added to southbound State Route 4 and westbound East Jemez Road. East Jemez Road will be widened to the north to accommodate the new lanes. There is some fill associated with the turnout to the Los Alamos County water well access roads in the northwest quadrant of the intersection. New construction will encroach on the 100-yr floodplain north of the intersection by an estimated 15,000ft^2.

Approximately 1200 ft^2 of riprap will be placed in the channel below the arched culvert.

The 4-wire fence east of the shooting range will have corner posts (outside of floodplain) anchored in concrete. T-posts will be used between the corner posts and will be pounded into the ground at regular intervals no less than 16ft and to a depth of no less than 36 inches. The pre-fabricated bridge does not require concrete footings, only a level, stable location to span the channel.

Related Projects

TA-72 Shooting Range Upgrades Project: This project included 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-yr floodplain in lower Sandia Canyon at Technical Area (TA)-72 at the Outdoor Live Fire Range facility within Los Alamos National Laboratory (LANL), New Mexico. The Floodplain Assessment (LA-UR-18-9766) "Floodplain Assessment for the TA-72 Outdoor Live Fire Range Upgrades and Channel Stabilization Upgrades at Los Alamos National Laboratory" for this project was released for comment with a subsequent statement of findings posted online in November 2018 at https://www.energy.gov/nnsa/other-environmental-documents. NNSA determined that the proposed actions would result in both short and long-term, direct and indirect impacts to the 100-yr floodplain; however, all impacts would be minimized and mitigated through the use of storm water controls throughout the project area.

Lower Sandia Watershed Controls Project: The Lower Sandia Watershed Controls Project is located in TA-72, less than half a mile upstream from the Intersection Project. 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 **https://www.energy.gov/nnsa/other-environmental-documents**. 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-yr floodplain.

FLOODPLAIN IMPACTS

Activities associated with the proposed project 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.

Short-term Impacts

Short-term direct impacts to the floodplain from these projects include temporary ground disturbance associated with the construction of extra lanes to East Jemez Road and the installation of the wire fencing and the bridge east of the TA-72 Shooting Range Facility.

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

All ground-disturbing activities at LANL are required to obtain a LANL issued excavation permit. This permitting process evaluates potential issues such as underground utilities, contaminated soils, threatened and endangered species impacts, impacts to floodplains or wetlands, cut and fill activities in Waters of the U.S., and specific US Army Corp of Engineers permit requirements. With a footprint of over an acre, the following requirements will apply to the Intersection 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 to control erosion after construction activities are completed.
- EISA Section 438 coverage, which requires that Federal projects manage stormwater runoff to pre-disturbance levels. Storm water runoff will be conveyed from the road surface to the associated drainage by a series of riprap-lined swales, rundowns and energy dissipation structures.

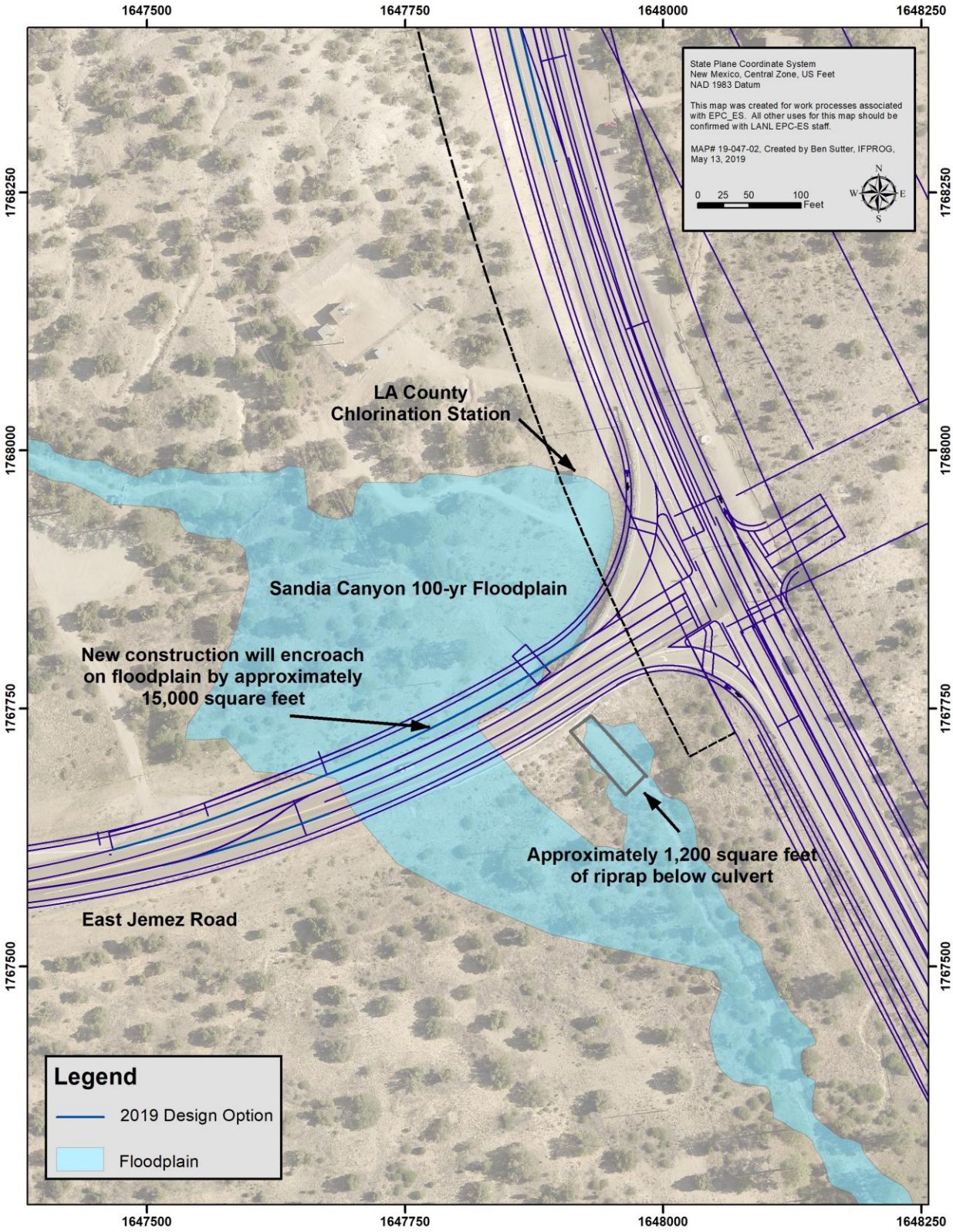

Figure 1. Aerial photo showing current intersection configuration with new configuration overlay and 100-yr floodplain.

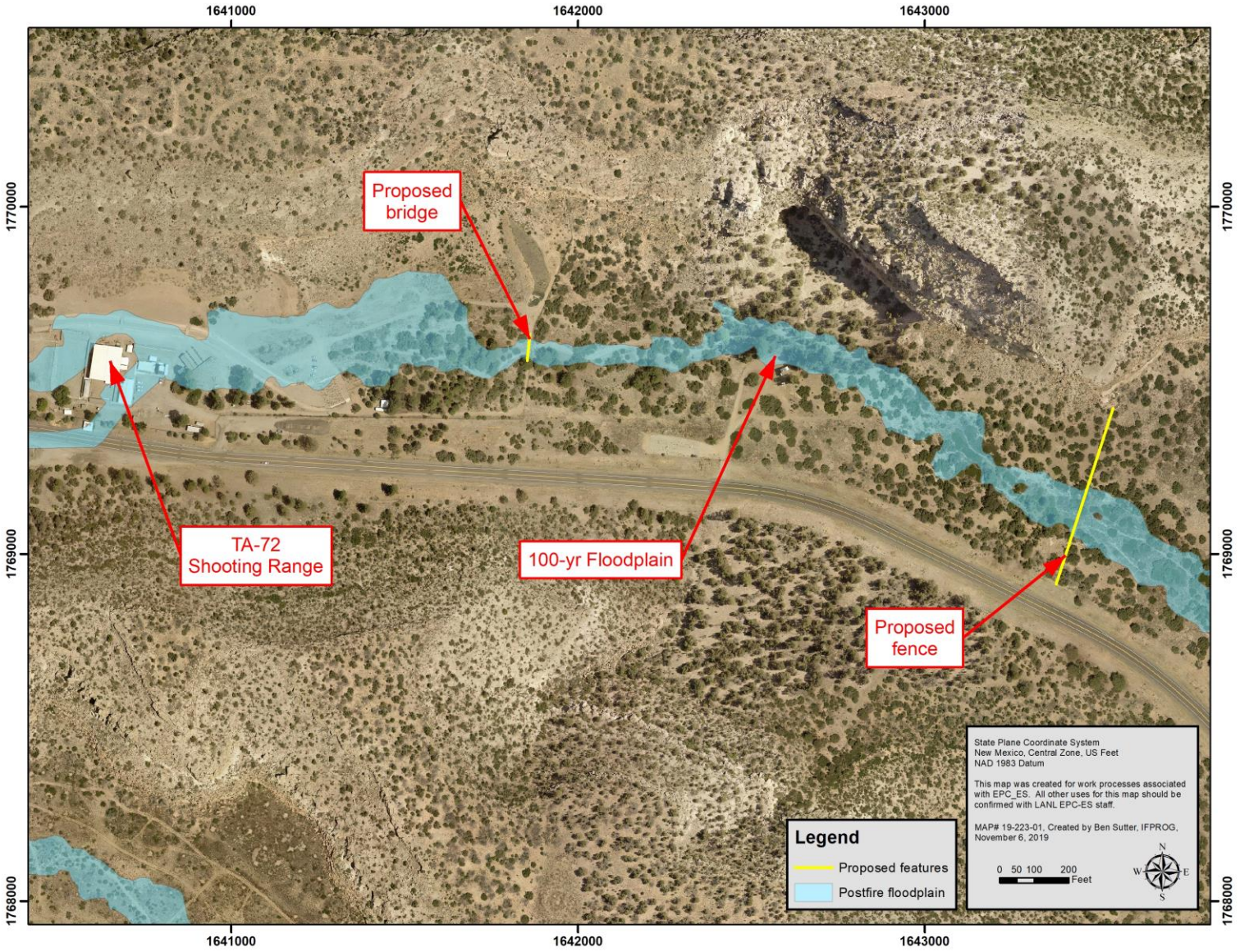

Figure 2. Aerial photo showing 100-yr floodplain and 4-wire fence and pre-fabricated bridge locations.

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

- 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 100ft from any drainage, including dry arroyos.

Potential direct effects to migratory birds and other biological resources would include short-term disturbance related to noise and human presence during construction. Adult migratory birds would give way to construction equipment to avoid being killed or injured. The Migratory Bird Treaty Act prohibits killing migratory birds, including nestlings and eggs in an active nest. Therefore, if vegetation removal is required, it would be coordinated to occur outside of the nesting season for migratory birds (May 15 through July 31). If construction activities occur during the nesting season, an onsite inspection for bird nests from LANL Biological Resource subject matter experts may be requested. Construction activities will conform to requirements stipulated in the Migratory Bird Best Management Practices Source Document for Los Alamos National Laboratory (LANL 2011).

Long-term Impacts

Long-term direct and indirect impacts to the floodplain of the proposed Intersection Project are primarily through a change in flood storage volume, a result of widening East Jemez Road. New construction will encroach on the 100-yr floodplain by an estimated 15,000 ft^2. However, there are plans to build a retaining wall along the north side of the road, which will prevent the 100-yr flood from overtopping the road and should expand the upstream extent of the floodplain, thereby mitigating floodplain losses due to road expansion.

No long-term direct or indirect impacts to the floodplain are anticipated from the installation of the fencing or the pre-fabricated bridge east of the TA-72 Shooting Range Facility.

The Lower Sandia Watershed Controls Project will slow floodwater velocities to the Intersection Project area and increase infiltration, thereby providing additional flood attenuation benefits to flows that reach the intersection. Although floodplain elevations will change, the proposed changes will not obstruct rising floodwater other than the retaining wall to prevent overtopping the road. With the exception of proposed widening of East Jemez Road, changes to the floodplain are expected to be minimal, and not increase surface water velocities from the floodplain to the channel.

An evaluation of the effects of the proposed actions on the floodplain considered conservation of habitat for existing flora and fauna, cultural resources, aesthetic values, and public interest. The proposed actions may remove potential habitat, but 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 most activities will occur in areas that have been previously disturbed.

The floodplain identified within the proposed actions is entirely located within LANL property, and uninhabited by people beyond facility personnel. The County of Los Alamos maintains a water well on DOE property NW of the intersection (Photo 1). There is a chlorination station located within the 100-yr floodplain but the county has plans to move that out of the floodplain. No impacts to lives or private property associated with floodplain disturbance are anticipated from these projects.

ALTERNATIVES

Five different design options for the Intersection Project were described in a Conceptual Design Document. The current option was chosen as the best for safety and traffic flow. This option was modified from the original to include a retaining wall to prevent floodwater overtopping East Jemez Drive during a 100-yr event.

The proposed fencing location is based on the new shooting range orientation and distance from the shooting range facility. The canyon and the floodplain are narrower at the proposed location and are less likely to impact floodplain function. The proposed bridge location is just inside the current eastern perimeter fence.

CONCLUSIONS

Although the proposed projects will result in both short and long-term, direct and indirect impacts to the 100-yr floodplain, they will not result in adverse impacts to the floodplain values or functions. Short-term impacts will be minimized through the use of best management practices during and following construction activities. Modifications to the 100-yr floodplain are associated with widening East Jemez Road to the north of the current footprint and with the addition of a retaining wall to prevent overtopping the road during a 100-yr event. Flow paths through the new intersection are essentially unchanged. No long-term adverse impacts to the floodplain are expected from the installation of the 4-wire fence or the prefabricated bridge.

DOE/NNSA will publish, in accordance with 10 CFR 1022, a Statement of Findings that will include a brief description of the proposed projects, an explanation of why they are located in a floodplain, the alternatives considered, a statement indicating if the actions conform 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 2011. Migratory bird best management practices source document for Los Alamos National Laboratory revised November 2011. Hathcock, Charles D ; Hansen, Leslie A ; Fair, Jeanne M ; Keller, David C. LA-UR-11-06629.

3AEGreen. 2018. FY19 SEP East Jemez Road and NM 4 Intersection, Los Alamos, New Mexico Traffic Study and Concept Design Report. October 11, 2018. Prepared for the U.S. Army Corps of Engineers, South Pacific Division, Albuquerque District.

Photos

Photo 1. View of floodplain north of East Jemez Road, facing east.

Photo 2. View of floodplain north of East Jemez Road, facing west.

Photo 3. View of multi-plate arch culvert under Ease Jemez Road, facing north.

Photo 4. View of channel/floodplain south of East Jemez Road, facing south.

Photo 5. View of double box culvert under State Route 4, facing east.

Photo 6. Approximate location of 4-wire fence across Sandia Canyon, facing north.

Photo 7. 10-ft X 30-ft pre-fabricated bridge.

Photo 8. Approximate location of pre-fabricated bridge crossing Sandia Canyon, facing south.