

NEPA REVIEW SCREENING FORM (NRSF) 3A
Categorically Excluded Actions

Document ID #:
DOE/CX-00200

I. Project Title:

LASER INTERFEROMETER GRAVITATIONAL-WAVE OBSERVATORY, HANFORD, WIND FENCES AND OPTICAL FILTER CAVITIES

II. Describe the proposed action, including location, time period over which proposed action will occur, project dimension (e.g., acres displaced/disturbed, excavation length/depth), and area/location/number of buildings. Attach narratives, maps and drawings of proposed action. Describe existing environmental conditions and potential for environmental impacts from the proposed action. If the proposed action is not a project, describe the action or plan.

The National Science Foundation (NSF) is a federal agency that provides oversight of the Laser Interferometer Gravitational-Wave Observatory, Hanford (LHO), which is operated by the California Institute of Technology (Caltech) and the Massachusetts Institute of Technology (MIT). The LHO is located on U.S. Department of Energy (DOE) property under a permit from DOE. The NSF and LHO propose to construct wind fences at the LHO facility X-end and Y-end stations. The proposal also includes installation of optical filter cavities (FC) on the existing Y-arm beam tube. The proposal would allow collection of five times more gravitational wave signals by controlling feedback generated from light waves and wind-induced vibration effects (see Figure 1). The proposal includes the following:

Y-Arm Beam Tube Enclosure and End Station. An 11.5 feet wide enclosure attached to the existing Y-arm beam tube would be constructed to protect a one-foot diameter FC beam tube. The enclosure would extend approximately 740 feet from the corner station toward the Y-end station. A 3,229 square feet end station would be constructed at the end of the FC beam tube, which would contain a single vacuum chamber and its supporting mechanical, optical, and electronic infrastructure (see Figure 2).

The FC beam tube enclosure and end station would be constructed on a reinforced concrete slab-on-grade, which would require excavation to approximately 12 inches. The FC beam tube end station rooflines would be approximately 26 feet high and would be visible above the profile of the existing LHO facility X-arm and Y-arm beam tube enclosures, which are 10 feet high. The existing LHO facility rooflines are 40 feet high. Existing dirt roads along the Y-arm beam tube would be improved for site access from the existing X-arm beam tube overpass.

Wind Fences. The wind fences would be approximately 300 feet long and up to 36 feet high, and would be positioned to block prevailing surface winds, which are from the southwest during most months. The fences would have black, polypropylene flame-retardant material (60% solid/40% porosity), supported by wooden or metal poles every 20 feet. The bottom of the fences would be 4 feet above the ground. The design of the fence for the Y-end station was modified from a straight line to an arc to reduce impacts to habitat and provide better reduction of wind effects.

Construction is scheduled to take place during the month of October, 2019, and would include surface grading, trenching for utilities, and excavation to a maximum depth of approximately 12 feet. All activities would take place within the existing LHO facility boundaries. Support activities such as materials staging/laydown, access road improvements, and infrastructure support would take place within the "Area of Potential Effects" (APE), which, for the purposes of this analysis is also described as the "project area."

Because the fences would be 4 feet above the ground, and would be open-ended, they would not impede wildlife movement (including migration). In addition, surface water is not present in the project area, given the granularity of Hanford soils, high infiltration rates, low annual precipitation rates, and high evapotranspiration rates. Thus, there would be no impact to surface water.

Ecological Resources Review. DOE-RL Ecological Monitoring and Environmental Surveillance (EM&ES) surveyed the project area on July 11, 2019 (see Figures 3, 4, and 5). The "Hanford Site Biological Resources Management Plan" provides requirements for managing and protecting natural resources on the Hanford Site, ranks wildlife species and habitats based on the level of concern for each resource (Levels 0 through 5). The project area contains native shrubs, bunchgrasses, and forbs. It also contains non-native invasive plant species; including Washington State listed noxious weeds. Wildlife observed included several species of birds, reptiles, and mammals.

The following summarizes ecological resource observations in the project area by habitat level. No BRMP Level 4 habitats were observed in the project area. Mitigation measures to avoid or

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minimize impacts to ecological resources are discussed under Mitigation Measures below, after the BRMP habitat levels.

BRMP Level 5 Habitat. BRMP Level 5 habitats are sensitive habitats on the Hanford Site. The management goal for Level 5 habitats is preservation because any loss would be a significant impact to threatened or endangered species populations and the site's biological diversity. The X-end station is adjacent to a plant community element occurrence that is associated with a dune complex that stretches from State Route 240 to the Columbia River.

BRMP Level 3 Habitat. BRMP Level 3 habitats are categorized as shrub-steppe communities that contain discontinuous canopies of climax shrubs, as well as transitional shrub-steppe and steppe communities that are predominantly native species. These habitats are important to sustaining native wildlife populations and serve as refuges for shrub-steppe obligate species and wildlife corridors. The project area contains approximately 2.47 acres of Level 3 habitat at the X-end station and Y-end station. The management goal for Level 3 habitats is conservation with a preference for avoidance and minimization of impacts.

BRMP Level 2 Habitat. BRMP Level 2 habitats are characterized as a successional shrub overstory with a predominantly non-native understory with some native grasses present. These habitats are found outside disturbed areas surrounding most of the structures at the LHO facility and covers approximately 6.38 acres of the project area. The management goal for Level 2 habitats is conservation with a preference for avoidance and minimization of impacts.

BRMP Level 1 and Level 0 Habitats. BRMP Level 1 habitats are associated with highly disturbed industrial areas including non-vegetated areas with a ground cover dominated by cheatgrass. Level 0 habitats are paved or graveled surfaces. Level 1 and Level 0 habitats provide little or no ecological value and require no specific protection or conservation.

Mitigation Measures. Coordination of environmental requirements will take place between DOE-RL and the LHO Operations Manager. BRMP Level 0 and Level 1 habitats were identified as locations for construction materials staging and equipment laydown. Maintenance of the wind fences would be performed from Level 0 habitat using an articulating boom if necessary.

A pre-construction walkdown was performed on September 17, 2019 to delineate high-quality habitats and biological resources for avoidance during construction activities. Pin flags were placed to delineate habitats to be avoided during construction. The LHO Operations Manager will instruct project personnel to avoid impacts to these areas.

Upon direction from DOE, EM&ES would conduct a post-construction survey to determine if any impacts to ecological resources occurred that would require additional mitigation, and make recommendations regarding mitigation to DOE.

Cultural Resources Review. DOE-RL Cultural and Historic Resources Program (CHRP) conducted a Cultural Resources Review (CRR) of the proposed project. CHRP sent an Area of Potential Effect (APE) notification to the Washington State Historic Preservation Office (SHPO) and regional Native American Tribes on June 26, 2019 (see Figure 6). CHRP conducted a cultural resources survey on July 11, 2019. No cultural materials were observed during the survey. CHRP transmitted a CRR, with a "No Historic Properties Affected" finding, to the SHPO and regional Native American Tribes for a 30-day comment period on July 23, 2019. The SHPO concurred with the findings of the CRR on July 24, 2019. CHRP provided a notice of compliance with Section 106 of the National Historic Preservation Act for this project on August 26, 2019.

CHRP's cultural resources clearance letter anticipates no impacts from the proposed construction. If cultural materials are encountered (mussel shell, bone, stone artifacts, burned rocks, charcoal, cans, and bottles) during construction activities, then work near the discovery would stop, and DOE would be notified. At DOE's direction, a CHRP archaeologist would assess the significance of the find, notify appropriate Tribes, and if necessary, make arrangements for mitigation of the find.

Any changes to the proposed project would require review and approval by the DOE-RL NEPA Compliance Officer.

III. Existing Evaluations (Provide with NRSF to DOE NCO):

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Ecological Review Report No. and Title:

MSA-1903526, A.L. Johnson, Mission Support Alliance, to M. Landry, LIGO Hanford, "Ecological Clearance for Facility Modification and Infrastructure Upgrades at the Laser Interferometer Gravitational Observatory (LIGO) Site, Hanford Site, (ECR-2019-632)," dated August 26, 2019.

Cultural Review Report No. and Title:

MSA-1903593, A.P. Fergusson, Mission Support Alliance, to M. Landry, LIGO Hanford, "Cultural Resource Clearance for Facility Modification and Infrastructure Upgrades at the Laser Interferometer Gravitational Observatory (LIGO) Site, Benton County, Washington, (HCRC-2019-600-010)," dated August 27, 2019.

Maps:

N/A

Other Attachments:

- Figure 1. Aerial View of LHO Facility Modifications Project Area
- Figure 2. Filter Cavity (FC) Beam Tube and End Station Site Plan
- Figure 3. Ecological Resources at Y-Arm Beam Tube Upgrade Site (ECR-2019-632)
- Figure 4. Ecological Resources at X-End Station Wind Fence Location (ECR-2019-632)
- Figure 5. Ecological Resources at Y-End Station Wind Fence Location (ECR-2019-632)
- Figure 6. Cultural Resources Area of Potential Effects (HCRC-2019-600-010)

IV. List applicable CX(s) from Appendix B to Subpart D of 10 CFR 1021:

B1.11, "Fencing"

B1.15, "Support Buildings"

V. Integral Elements and Extraordinary Circumstances (See 10 CFR 1021, Subpart D, B. Conditions that are Integral Elements of the Class of Actions in Appendix B; and 10 CFR 1021.410(b)(2) under Application of Categorical Exclusions)

Yes No

Are there extraordinary circumstances that may affect the significance of the environmental effects of the proposed action? If yes, describe them.	<input type="radio"/>	<input checked="" type="radio"/>
Is the proposed action connected to other actions with potentially significant impacts, or that could result in cumulatively significant impacts? If yes, describe them.	<input type="radio"/>	<input checked="" type="radio"/>
Would the proposed action threaten a violation of applicable statutory, regulatory, or permit requirements related to the environment, safety, health, or similar requirements of DOE or Executive Orders?	<input type="radio"/>	<input checked="" type="radio"/>
Would the proposed action require siting, construction, or major expansion of waste storage, disposal, recovery, or treatment facilities?	<input type="radio"/>	<input checked="" type="radio"/>
Would the proposed action disturb hazardous substances, pollutants, contaminants, or natural gas products already in the environment such that there might be uncontrolled or unpermitted releases?	<input type="radio"/>	<input checked="" type="radio"/>
Would the proposed action have the potential to cause significant impacts on environmentally sensitive resources? See examples in Appendix B(4) to Subpart D of 10 CFR 1021.	<input type="radio"/>	<input checked="" type="radio"/>
Would the proposed action involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, such that the action is not contained or confined in a manner designed, operated, and conducted in accordance with applicable requirements to prevent unauthorized release into the environment?	<input type="radio"/>	<input checked="" type="radio"/>

If "No" to all questions above, complete Section VI, and provide NRSF and any attachments to DOE NCO for review.
 If "Yes" to any of the questions above, contact DOE NCO for additional NEPA review.

VI. Responsible Organization's Signatures:

Initiator:

M. Landry, LIGO Hanford

Print First and Last Name


Signature

9/25/19
Date

Cognizant Program/Project Representative:

M. W. Coles, National Science Fdn

Print First and Last Name


Signature

9/26/19
Date

VII. DOE NEPA Compliance Officer Approval/Determination:

Based on my review of information conveyed to me concerning the proposed action, the proposed action fits within the specified CX(s): Yes No

Diori L. Kreske, DOE/RL - NCO

Print First and Last Name


Signature

9/26/19
Date

NCO Comments:

Figure 1. Aerial View of LHO Facility Modifications Project Area

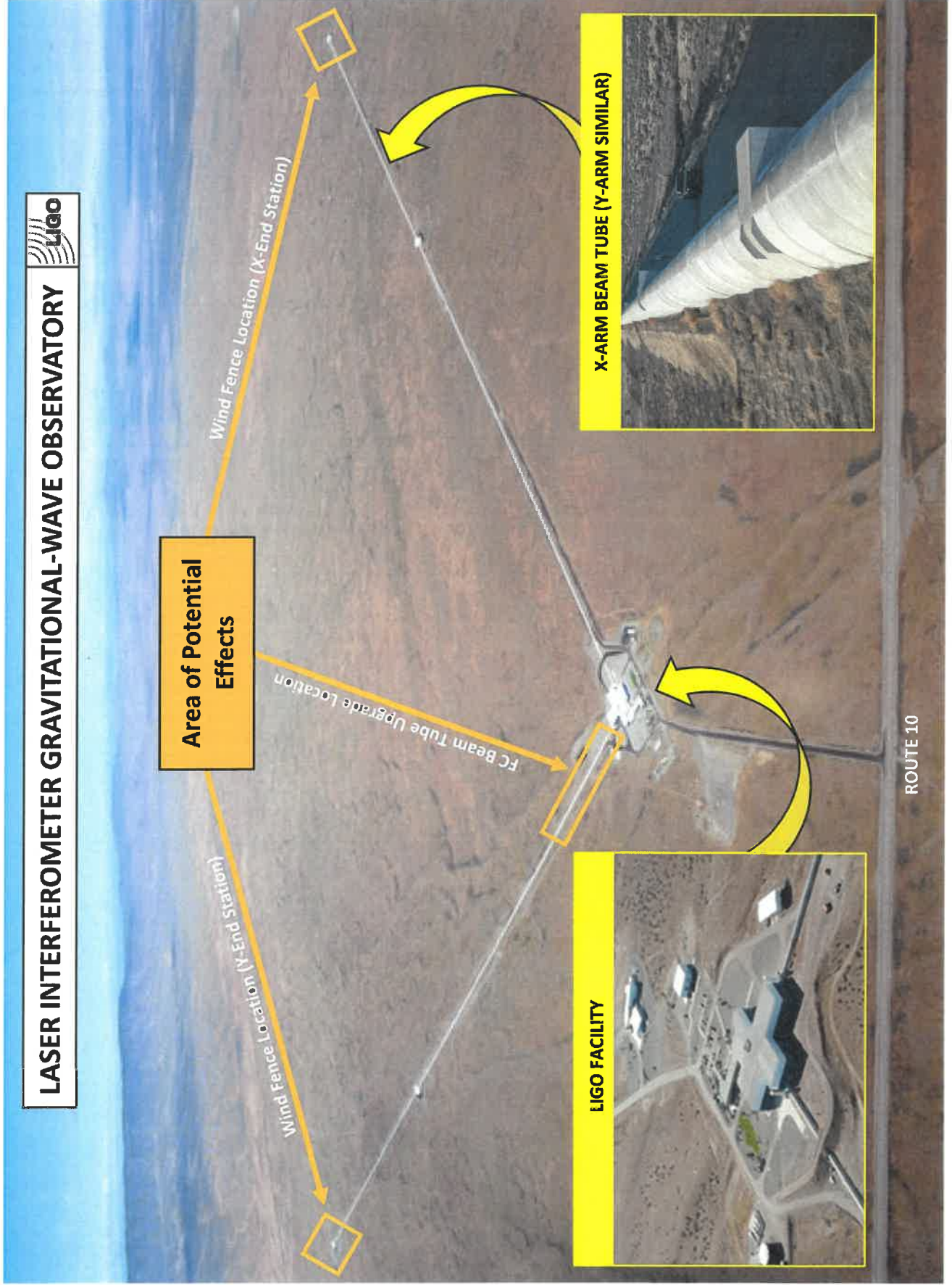


Figure 2. Filter Cavity (FC) Beam Tube and End Station Site Plan

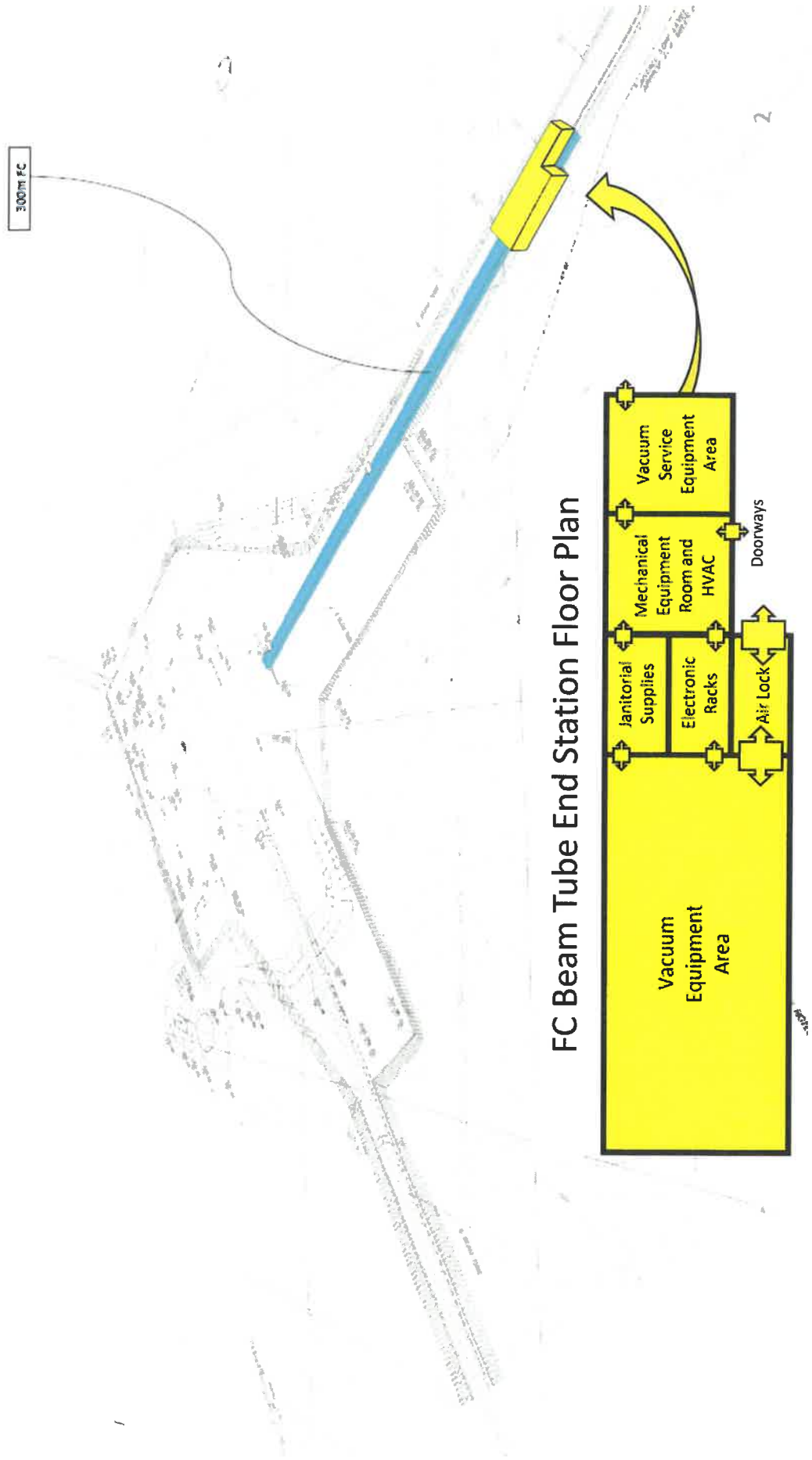


Figure 3. Ecological Resources at Y-Arm Beam Tube Upgrade Site (ECR-2019-632)

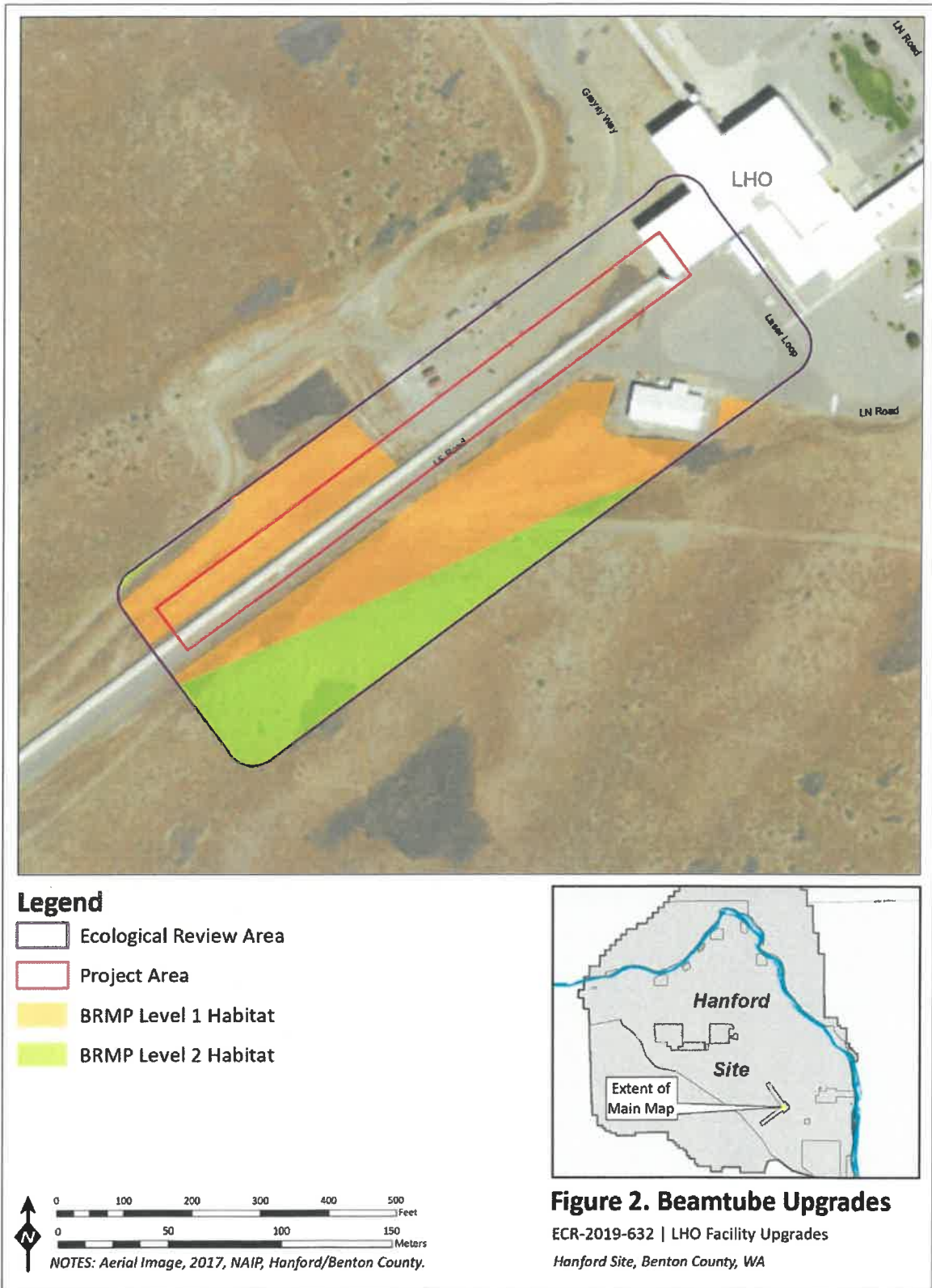


Figure 4. Ecological Resources at X-End Station Wind Fence Location (ECR-2019-632)

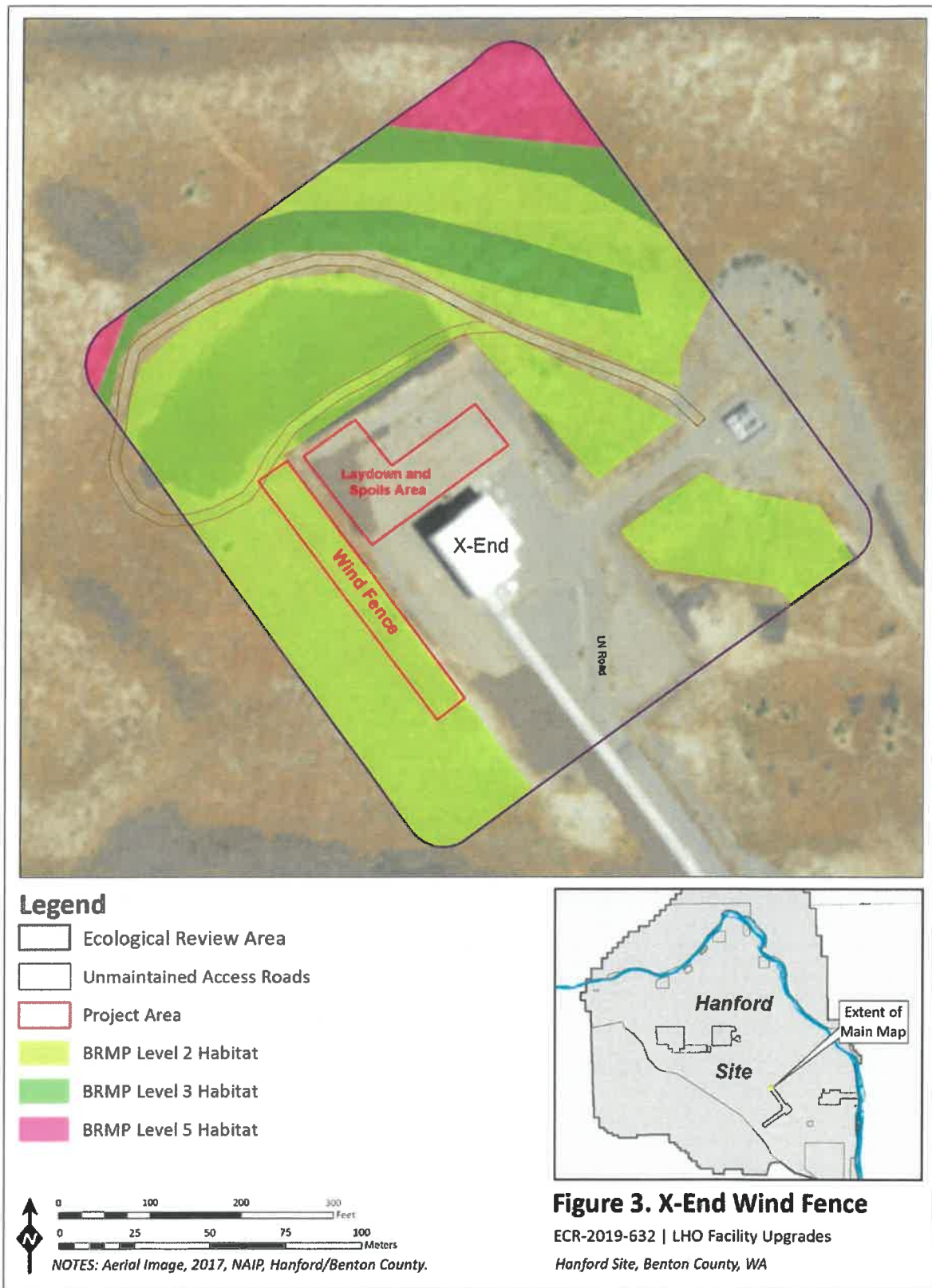


Figure 5. Ecological Resources at Y-End Station Wind Fence Location (ECR-2019-632)

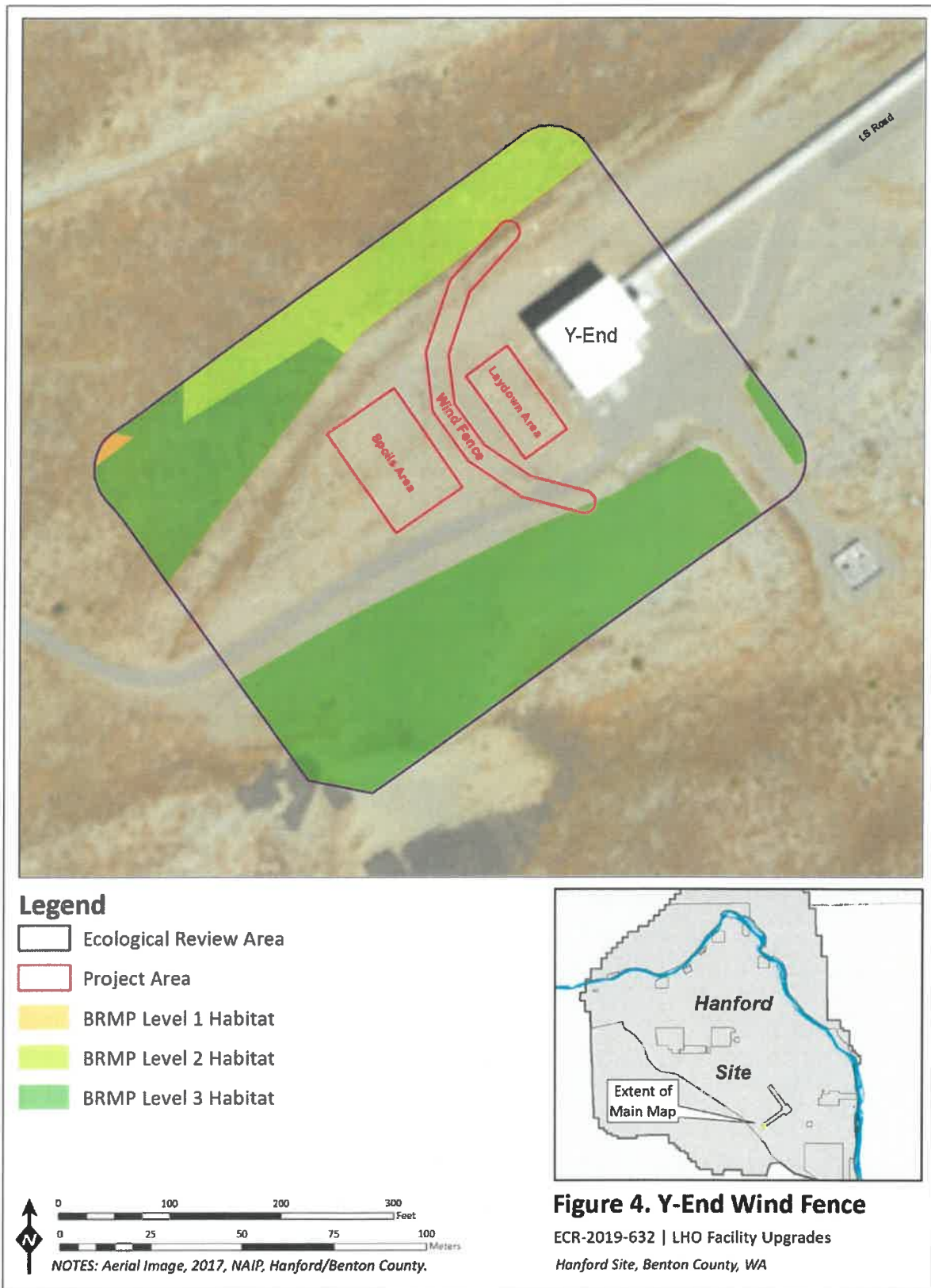


Figure 6. Cultural Resources Area of Potential Effects (HCRC-2019-600-010)



LEGEND

- Area of Potential Effect (APE)
- Hartford Operational Areas

Hartford Oper. Area 75' USGS Quad
 Township 11' N Range 27' E Sections 10 11 12 6 17
 Township 13' N Range 27' E Section 20

Aerial Imagery 2017, h4 P



Detail of Area of Potential Effect (APE)
 HCRC-2019-600-010
 Hartford Site, Benton County, Washington