
# Aurora Environmental Report—Combined License Stage

# TABLE OF CONTENTS



  

  

# TABLE OF FIGURES



  

# TABLE OF TABLES



  

# 1 INTRODUCTION

Oklo Inc. (Oklo) is motivated to develop clean energy generation sources such as the Aurora to mitigate the social and environmental impacts of climate change and pollution. Clean energy, such as that generated by the Aurora, reduce further climate change impacts while providing a solution to lessen the consequences of inevitable climate change effects. Clean energy mitigates further climate change impacts by avoiding the emissions that would be released from the burning of fossil fuels. At the same time, clean energy reduces the social impacts of climate change by providing power for tools such as air conditioning to manage heat waves, desalination for ensuring access to clean water, and controlled-environment agriculture to adjust to droughts.

This combined license application is novel in a number of ways in order to bring a new technology and power plant scale, operational model, and novel safety to reality. The purpose of bringing the Aurora to market through this application is fundamentally to improve social and environmental justice. One way in which the Aurora will achieve this is by taking significant initial steps towards the development and deployment of advanced reactors to help society decarbonize, and reverse climate change. Decarbonization and providing for the availability of power is the foundation for both addressing environmental issues as well as bringing those in energy poverty into a place of comfort and prosperity.

This Environmental Report is designed to address applicable regulations although they are designed for plants of approximately 500 times the thermal output. The key issues historically have included the immense water requirements of these large plants, as well as footprints in terms of the site and the workforce, and any releases or effluents. Because of the Aurora site has one building, has no need for cooling water, and a small workforce, this environmental report is simplified, and has few site-specific considerations anywhere in the United States. These characteristics make the Aurora plant environmental impact statement (EIS) a good candidate for examining the Congressional mandate to consider possibilities for a general EIS (GEIS). Although the report does not use the terminology “plant parameter envelopes,” the scope outlined by stating that site-specific issues are met by commitments is one way to outline an envelope of all sites found to be acceptable for the design based on existing analysis.

## 1.0 Purpose

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.80, “Contents of applications; additional technical information,” paragraph b, requires:

> An environmental report, either in accordance with 10 CFR 51.50(c) if a limited work authorization under 10 CFR 50.10 is not requested in conjunction with the combined license application, or in accordance with §§ 51.49 and 51.50(c) of this chapter if a limited work authorization is requested in conjunction with the combined license application.

Since Oklo Power LLC (Oklo Power) is not requesting a limited work authorization, an environmental report in accordance with paragraph c, “Combined license stage,” of 10 CFR 51.50, “Environmental report—construction permit, early site permit, or combined license stage,” applies. Section 51.50(c) to 10 CFR requires the following:

> Each applicant for a combined license shall submit with its application a separate document, entitled “Applicant's Environmental Report—Combined

  

> License Stage." Each environmental report shall contain the information specified in §§ 51.45, 51.51, and 51.52, as modified in this paragraph. For other than light-water-cooled nuclear power reactors, the environmental report shall contain the basis for evaluating the contribution of the environmental effects of fuel cycle activities for the nuclear power reactor. Each environmental report shall identify procedures for reporting and keeping records of environmental data, and any conditions and monitoring requirements for protecting the non-aquatic environment, proposed for possible inclusion in the license as environmental conditions in accordance with § 50.36b of this chapter. The combined license environmental report may reference information contained in a final environmental document previously prepared by the NRC staff. As stated in § 51.23, no discussion of the environmental impacts of the continued storage of spent fuel is required in this report.

As the Aurora is not a light-water-cooled nuclear power reactor, 10 CFR 51.51, "Uranium fuel cycle environmental data—Table S–3," is not applicable. The fuel cycle and fuel transportation environmental impact contributions, as required by 10 CFR 51.52, "Environmental effects of transportation of fuel and waste—Table S–4," are addressed through a requested exemption in Part V, "Non-applicabilities and exemptions." Information related to license environmental conditions may be included with the combined license, as dictated by 10 CFR 50.36b, "Environmental conditions." Since the Aurora has an overall overwhelmingly positive impact on the environment and does not have significant environmental impacts during construction, operation, nor decommissioning, no license environmental conditions are proposed.

The purpose of this part is to address the requirements in 10 CFR 51.45, "Environmental report." Specifically, contents of this Environmental Report are organized as shown in Table 1-1.

  

*Table 1-1: Organization of the Environmental Report*

| Chapter | Chapter title | Requirement |
|---|---|---|
| 1 | Purpose | None |
| 2 | Description of the Aurora site | |
| | Site description | 10 CFR 51.45(b) |
| | | 10 CFR 51.45(c) |
| | Site preparation | 10 CFR 51.45(b) |
| | | 10 CFR 51.45(c) |
| | Operational activities | 10 CFR 51.45(b) |
| | | 10 CFR 51.45(c) |
| | Status of compliance | 10 CFR 51.45(d) |
| 3 | Projected impacts | 10 CFR 51.45(b)(1) |
| | | 10 CFR 51.45(b)(2) |
| | | 10 CFR 51.45(b)(4) |
| | | 10 CFR 51.45(c) |
| 4 | Environmental impacts of alternatives | 10 CFR 51.45(b)(3) |
| | | 10 CFR 51.45(c) |
| 5 | Summary of impacts | |
| | Irreversible and irretrievable commitments of resources | 10 CFR 51.45(b)(5) |
| | Benefits and cost | 10 CFR 51.45(c) |
| Appendix A | Environmental commitment set | None |

## 1.1 Background

Oklo Power[1] is a privately funded company focused on commercialization of its 4 megawatt thermal (MWth) fission battery called the Aurora. One of the Aurora design objectives is to minimally impact the environment. The ability to offer reliable emission-free power to remote communities typically reliant on diesel power is a huge potential environmental benefit for these communities. Even cities as large as Fairbanks, Alaska have poor air quality because of the necessity to rely on emission-intensive fossil fuels like coal, diesel, and wood. The energy density of fission means that it requires far less materials, far less mining, and far less land area per unit of energy produced than any other power source, without emitting carbon dioxide or other emissions. The small size of the Aurora, its low operational requirements, and its ability to operate without using water as part of the power generation cycle mean that there is a very small environmental impact for the construction and operation of the plant.[2] And since Aurora plants will often be replacing the consumption and combustion of fossil fuels, the Aurora plants will provide an environmental benefit to the local community and to the planet.

[1] More information on Oklo and Oklo Power can be found in Part I, "Company information & financial requirements."

[2] More information of the Aurora design can be found in Chapter 2, "Description and analysis of structures, systems, and components," of Part II, "Final safety analysis report."

  

Oklo Power has potential customers for the Aurora in high-power-cost areas of the U.S., as well as in communities interested in lowering their carbon footprint. Many of these markets share the common challenges of high electricity prices and reliability concerns with their current electricity sources, largely because they are located in microgrids or are off-grid. The Aurora is intended to save costs significantly for these high-power-cost markets, while improving reliability of their electric power supply.

In addition to these microgrid or off-grid communities, many industrial customers connected to the traditional electric grid also desire enhanced reliability through an always-on, locally-sourced energy alternative. These customers include data centers, industrial sites, and power plants. For example, the reliability of electricity for data center users and owners is a major concern, as the world increasingly relies on these facilities to function 24/7. Another example is the need for a reliable backup power source for large, grid-connected, industrial sites and power plants, in the event of a partial disruption or total outage of the electrical grid. In many locations within the U.S., the grid is either expensive or unreliable such that a separate source of power is desirable.

In most cases, the Aurora will be serving a microgrid with well-defined power supply and demand. As a result, the "Need for Power" analysis is straightforward compared to projects that serve larger grids or multiple regions. Whether these customers are remote or simply islanded from the main grid, the available energy alternatives that meet the purpose and need for the Aurora are generally limited to diesel generators. Although the best current solution for these remote communities, diesel generators are not optimal for most locations for a variety of reasons, including: the high cost to transport diesel to most remote locations, the pollution created by diesel combustion, the supply chain risk in certain locations for shipment of diesel, the environmental risk of diesel tank storage, and other reasons.

The purpose of building the first Aurora facility is to demonstrate a first-of-a-kind advanced fission plant licensed by the U.S. Nuclear Regulatory Commission (NRC) that can provide broad economic and environmental benefits, including taking significant initial steps towards fighting climate change.

## 1.2 Environmental Report approach and structure

### 1.2.1 Environmental Report approach

The methodology used for this Environmental Report is shown in Figure 1-1 and described in this section. It is important to highlight that this methodology may be utilized for any Aurora site, and further, for most other technologies. Because this methodology is systematic and analyzes a wide range of impacts historically considered by large facilities, it is encompassing and appropriate for use by many technologies in addition to the Aurora.

Although the methodology does not use the terminology "plant parameter envelopes," the methodology does analyze and categorize an effective envelope within which environmental goals are met for the design for a wide variety of sites across the U.S. It does this by identifying environmental impact categories which either: (1) are applicable and mitigated inherently by the design, or (2) applicable and can be mitigated through site selection commitments, leaving a subset of categories that always apply and should be addressed on a site-specific basis in the Environmental Report, with a possibility for need for additional analysis in the Environmental Report for unusual site selections (as judged by the Table A-1: Candidate sites environmental

  

commitment set checklist). As such, it is expected that a GEIS could be considered for the Aurora design described in this reference application meeting the candidate site commitment set checklist.

In summary, the scope outlined by this methodology identifies impact categories that apply to the Aurora. Those impact categories that apply and may require site commitments are discussed in the appendix. Some of these impact categories discussed are mitigated inherently by the Aurora design and do not require specific environmental commitments. The impact categories not mitigated inherently by the Aurora design are mitigated through environmental commitments. Environmental commitments are commitments regarding siting to avoid impacts. These commitments are then evaluated on a site-specific basis in the Appendix on whether they are inherently met by the site or candidate sites selected, or whether additional analysis is needed regarding that commitment in the Environmental Report.

  

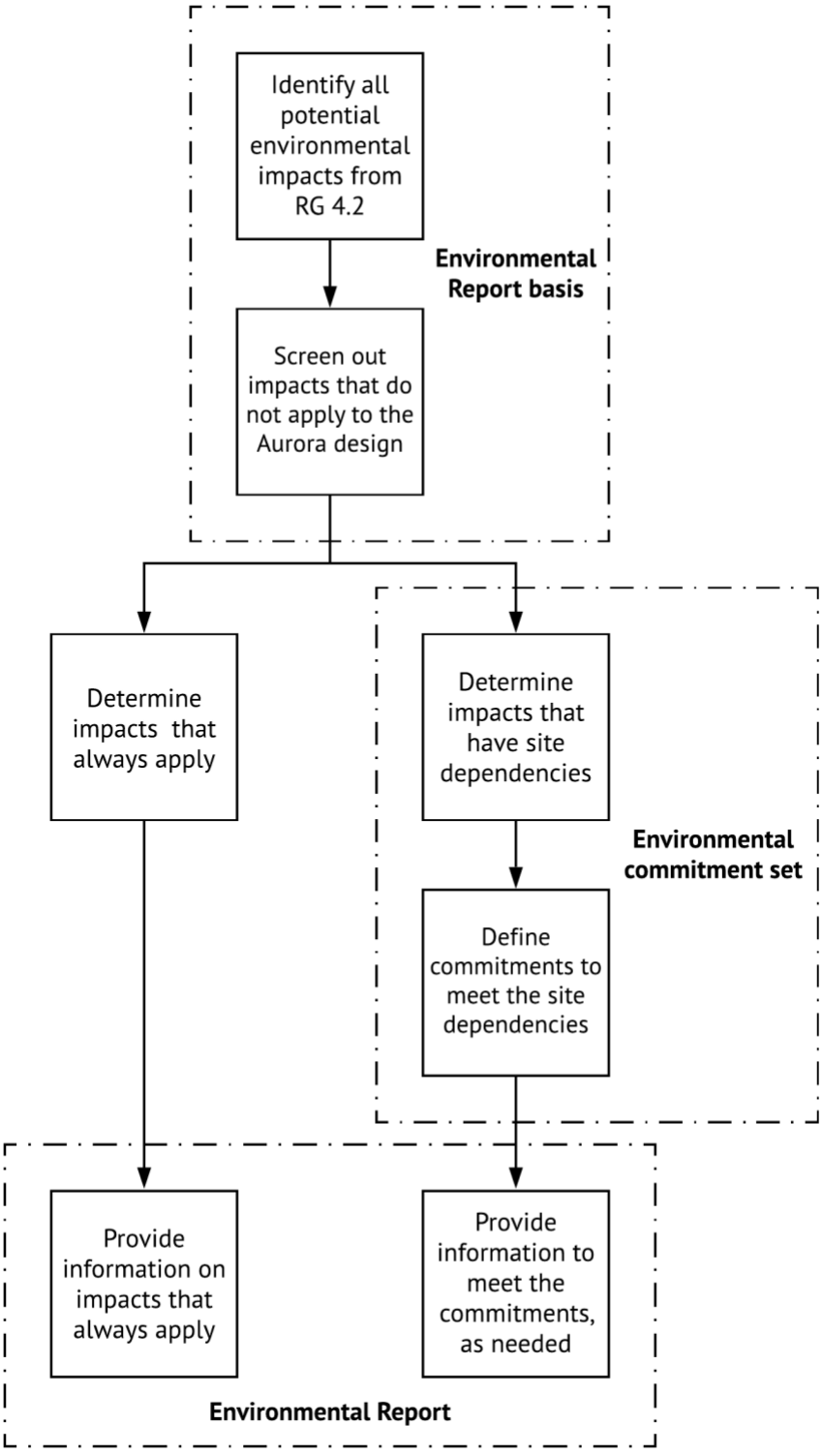


*Figure 1-1: Methodology for the Environmental Report*

  

The content provided in this Environmental Report is largely informed by Regulatory Guide (RG) 4.2, Revision 3, "Preparation of environmental reports for nuclear power stations," issued September 2018. In order to ensure that the appropriate environmental analyses are performed, each of the topics discussed in RG 4.2 is evaluated for applicability to the Aurora and documented as the Environmental Report basis.

The full Environmental basis evaluation is not provided in this report or the appendix. Some characteristics from RG 4.2 are clearly not applicable for the Aurora. However, issues determined to be of interest to describe the methodology are included in Appendix A, as well as the resultant site-independent Aurora environmental commitment set, with the corresponding Aurora INL site specific commitment evaluations. An environmental commitment describes the specific action Oklo will perform if the site has a characteristic that might require more environmental analysis. This additional specific action would be included in the Environmental Report, as needed for a specific site. The Environmental Report which addresses the commitment set specifically for the Aurora INL site is in the main body of this Part and begins in Section 2.

Throughout the Environmental Report, the terms used to describe the stage of the project are the site preparation phase and the operations phase. The activities considered by the definition of construction provided in 10 CFR 51.4, "Definitions," do not have a significant environmental impact for the Aurora. Thus, the construction phase, as defined in the regulations, is not discussed as part of the Environmental Report, with the focus instead being on the site preparation phase which includes all environmentally impactful processes. Site preparation for the Aurora is equivalent to preconstruction activities, as the term is used in 10 CFR 51.45.

### 1.2.2 Environmental Report structure

The Environmental Report structure is as follows:

- Chapter 1, "Purpose," provides an introduction to the project and this Environmental Report.
- Chapter 2, "Description of the Aurora site," provides an overview of the site. Additionally, this chapter includes descriptions of the site preparation and operations activities that interact with the environment.
- Chapter 3, "Projected impacts," describes the applicable environmental topics from the Environmental Basis and the environmental commitment set. The environmental impacts of site preparation and operations are consolidated to combine relevant information on individual environmental resources.
- Chapter 4, "Environmental impacts of alternatives," describes ultimate heat sink alternatives for the Aurora.
- Chapter 5, "Summary of impacts," discusses the commitment of resources, the benefits and costs of the project, and the cumulative impacts of the project.
- Appendix A: Environmental commitment set," outlines the methodology for site-independent environmental commitments as well as the site-specific evaluation of that commitment to determine if it is to be included in the Environmental Report.

  

## 1.3 Definitions

The following terms are specific to the Aurora and are used throughout this report.

**Aurora INL site**: The area being evaluated in this Environmental Report, which encompasses the candidate sites for the Aurora at the INL Site. The actual area used for the Aurora powerhouse and a minimum of other site modifications is much smaller, less than about a quarter of an acre. The only building on the site is the Aurora powerhouse. Other small structures and modifications in the Aurora site may include a driveway, parking, microgrid interconnections storage. This site is leased from Idaho National Laboratory (INL).

**Aurora powerhouse**: The only building onsite. The Aurora powerhouse houses the reactor module and secondary system as well as other supporting equipment. The Aurora powerhouse makes up the exclusion area, low population zone, and emergency planning zone.

**candidate sites:** The sites that could be locations for the Aurora powerhouse.

**dependency:** A site characteristic that determines the depth of environmental analysis.

**environmental commitment:** The specific action Oklo Power will perform to maximize environmental benefit if there is a specific site characteristic present.

**environmental commitment set:** The collection of environmental commitments.

**The Idaho National Laboratory (INL):** One of the U.S. Department of Energy's complex of national laboratories, headquartered in Idaho Falls, ID. The mission of the INL is to discover, demonstrate and secure innovative nuclear energy solutions, other clean energy options and critical infrastructure.

**INL Site**: The INL Site is a federal facility that is approximately 890 square miles in size and located in Bingham, Bonneville, Butte, Clark, and Jefferson counties near Idaho Falls, Idaho. At the INL Site, the U.S. Department of Energy and its contractors conduct multi-program activities, including, but not limited to, nuclear research and development, waste management, environmental remediation, technology development and transfer, and national security missions.

  

# 2 DESCRIPTION OF THE AURORA SITE

## 2.1 Overview of the Aurora

The Aurora site includes only a single building with an additional shelter for the energy storage inverter, as displayed in Figure 2-1. The Aurora powerhouse has two floors and has a footprint of less than 5,000 square feet. The first floor of the Aurora powerhouse provides for monitoring of the plant, access control, and maintenance. At the front of the first floor is a visitor area. The supercritical carbon dioxide power conversion system (PCS) is located on the first floor and is connected to dry air coolers (i.e. radiators). The radiators are located external to the Aurora powerhouse. The radiators exchange heat with ambient air as the ultimate heat sink for the power cycle. The reactor module is emplaced below the floor of the basement. There is a parking lot for the site as well as landscaping surrounding the site. An energy storage inverter is located in a shelter approximately 50 feet away from the building. There are no structures other than the Aurora powerhouse and the energy storage inverter shelter on the site.

The boundary shown in Figure 2-1 is the site boundary and unrestricted area. The site boundary is the line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee. Unrestricted area, the area outside the site boundary, means an area to which access is neither limited nor controlled by Oklo Power.

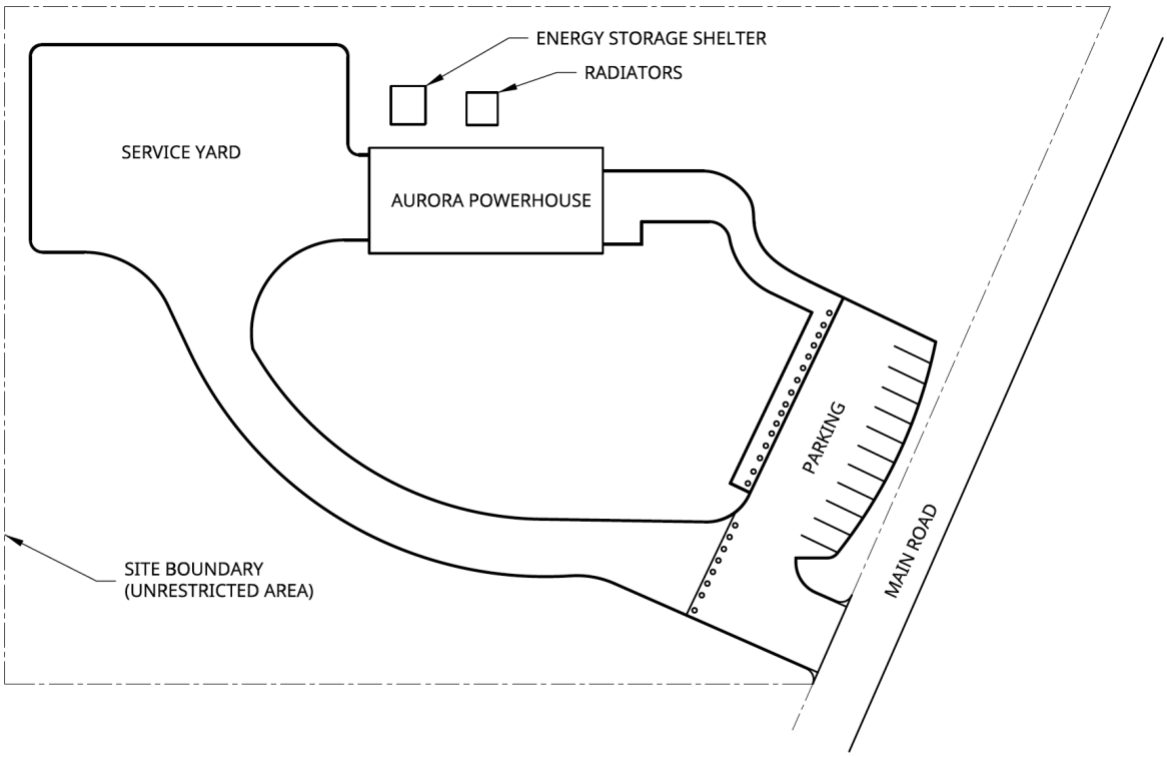


*Figure 2-1: Schematic of the Aurora site*

  

## 2.2 Site description

Oklo Power is proposing to build the Aurora, a 4 MWth advanced fission plant, also called a fission battery, near the Materials and Fuels Complex (MFC) at the INL Site. There are currently five sites (i.e., the candidate sites) that are under consideration for the exact location of the Aurora. As the sites are within a mile radius, they all have similar environmental impact and siting characteristics to take into consideration. All candidate sites are greenfield sites outside of any security fence. The candidate sites are all in a developed region, minimizing the possibility of cultural impacts. As a developed area, existing roads, water services, transportation infrastructure, and power lines can be extended easily for the Aurora powerhouse.

The Aurora has minimal footprint and impact on the environment, so there are many appropriate locations at the INL Site based solely on environmental characteristics. After reviewing the greenfield sites available at the INL Site, the five candidate sites are selected as possible locations for the Aurora. The sites are evaluated based on all of the following criteria:

- Wildlife and ecosystem characteristics
- Avoidance of culturally relevant sites
- Available infrastructure
- Public accessibility

Table 2-1 describes and compares the candidate sites. All of the candidate sites avoid culturally relevant sites and sensitive wildlife or ecosystem areas, so the considerations list only infrastructure or accessibility related issues.

*Table 2-1: Results of site selection process*

| Site | Description | Considerations |
|---|---|---|
| 1 | Site south of Y turnoff | Further from established parking area than sites 1 and 2 |
| 2 | Site near transmission substation | Closest to transmission lines, but possibly less scenic |
| 3 | Site at southwest corner of dirt road | Closest to parking area but further from transmission lines |
| 4 | Site of the MFC guard building | Furthest from the resources at MFC, parking, and transmission lines |
| 5 | Site to the northeast Y turnoff | Further from established parking area and transmission lines than sites 1, 2, and 3 |

Figure 2-2 shows the candidate sites along with relevant environmental characterization data. The site boundaries associated with each potential site encompass 1 acre of land represented by the white rectangles. It is not anticipated that the Aurora powerhouse and associated site characteristics will require more than one quarter of an acre of disturbed land area, but the acre represents an area within which the exact placements could be made.

  

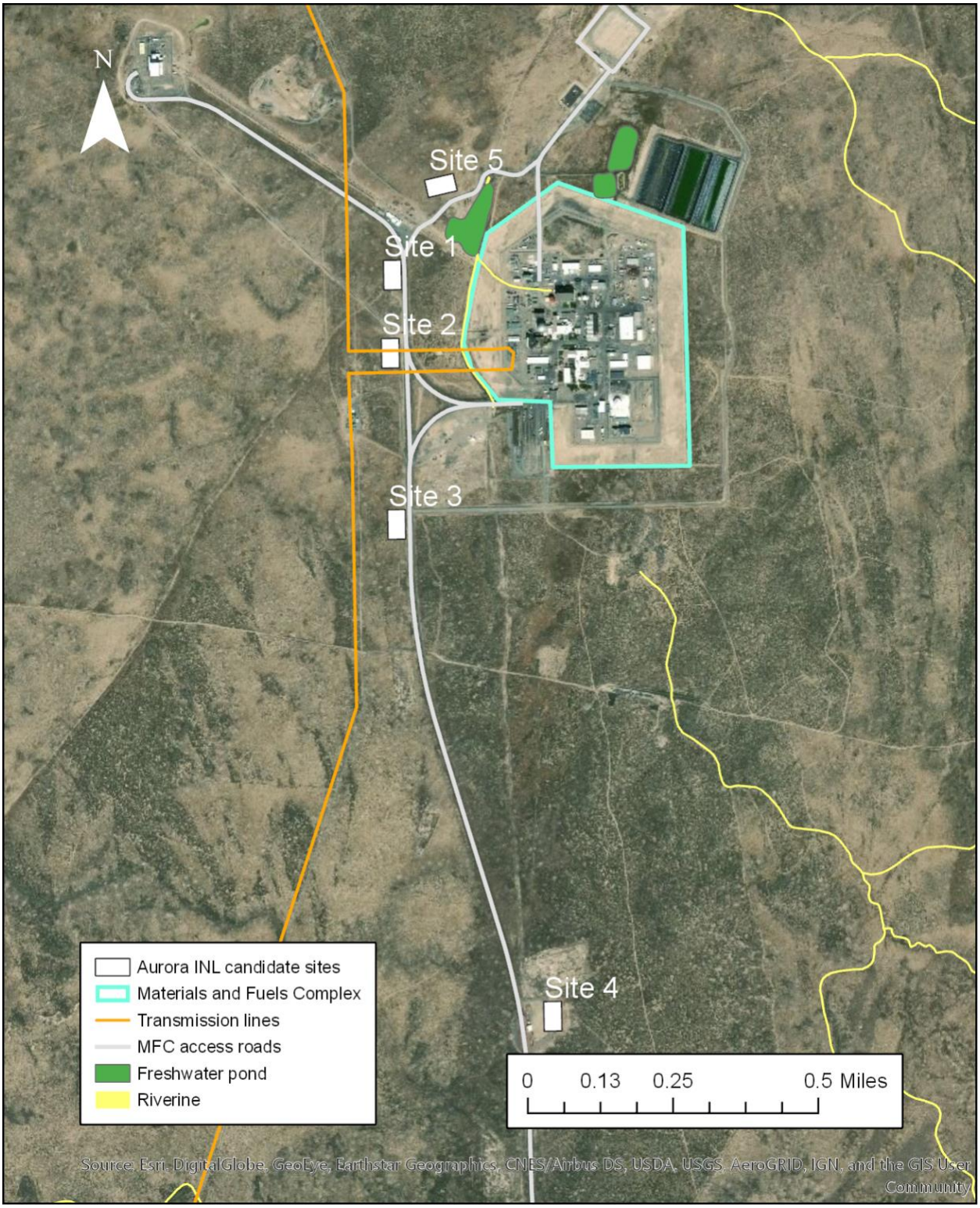


*Figure 2-2: Candidate sites*

  

## 2.3 Site preparation

Site preparation for the Aurora is not similar to the site preparation or construction of a typical large light water reactor (LWR). For comparison, the Aurora is approximately 500 times smaller in power output than a typical LWR. Most of the Aurora components will be fabricated and assembled offsite and will be small enough to be transported and installed without significant challenges. The Aurora does not have components that cannot be transported by truck or that cannot be lifted by readily available cranes. The site preparation and construction periods are estimated to take between 1 and 6 months. At the peak employment for construction, there are expected to be approximately 40 construction workers.

The area requiring site preparation is limited to the Aurora powerhouse area, plus some additional area for the coolers (also called radiators), area for parking, any roads or driveway, and space used for temporary structures during site preparation. The site area is expected to be about one quarter of an acre, and any roads, temporary buildings, transmission line preparation, or additional grading site preparation work required in addition to that one quarter of an acre will depend on the specific site.

The total excavation required is approximately 20,000 cubic feet ($ft^3$) for the Aurora powerhouse, but there will be additional excavation required for the roads and support infrastructure at the site. The excavation work is performed using standard construction equipment because the basement and holes for the foundation support are not unusually deep or wide.

The basic steps for site preparation are given below:

1. Clear and grade the site as needed.

2. Installation of site preparation support facilities such as shop facilities, docking and unloading facilities, and temporary support buildings.

3. Earthwork for the Aurora powerhouse.

4. Install the Aurora powerhouse foundation. Backfill as appropriate with borrowed material excavated from the site or with additional backfill material if needed.[3]

5. Construct Aurora powerhouse, place the reactor module, and other supporting structures.

6. Installation of services such as electricity, sewage, and water for incidental and sanitary use.

7. Place the PCS, electrical transmission equipment, and other supporting systems.

[3] The design and composition of the backfill impacts the building settlement and water seepage surrounding the foundation. If necessary, the backfill material might be augmented with other materials to improve the building support.

  

## 2.4 Operational activities

The Aurora has a 20-year operating life. The Aurora operational activities have minimal overall impacts on the environment. An estimated 15 full-time local employees will work at the Aurora INL site with generally not more than two onsite at any given time. More information on the organizations structure for the site can be found in Chapter 13, "Organizational structure for operations," to Part II, "Final Safety Analysis Report."

### 2.4.1 Plant-environment interfaces during operation

The two plant-environment interfaces for the Aurora facility are for the rejection to the air from the PCS radiators and the heating, ventilation, and air conditioning (HVAC) systems.

### 2.4.2 Power cycle heat rejection

#### 2.4.2.1.1 Power cycle heat rejection

In a similar way to large building heating or air conditioning systems which utilize radiators, heat from the PCS will be released directly to the air, which functions as the ultimate heat sink for the Aurora facility. The radiators are located outside of the Aurora powerhouse. Due to the relatively small generation size of the Aurora, the plant rejects approximately 500 times less heat than a large LWR. Because the heat rejected is minimal, it is not discussed further in the Environmental Report.

#### 2.4.2.1.2 Heating, ventilation, and air conditioning

There are multiple HVAC systems that service different areas of the building. The HVAC systems will circulate air through the facility in a similar way as any standard commercial or industrial building. The HVAC systems use heat exchangers located outside of the Aurora powerhouse to reject heat to the air. Since the HVAC used for the Aurora is standard commercial HVAC and commensurate with the small size of the Aurora powerhouse, the air flows and total heat rejected to the environment are small. Therefore, the impacts to the environment from HVAC are not further discussed.

## 2.5 Status of compliance

Oklo has signed a Site Use Permit with the U.S. Department of Energy (DOE). The Site Use Permit outlines permissions, conditions, liabilities and responsibilities for Oklo to be able to use land at the INL Site. Oklo Power performed a review of Federal, State, and county permits, codes, and regulations, to determine applicability. As stated in the Site Use Permit, INL will assist for utilities needed at the Aurora INL site. Thus, no utility-related permits, codes, regulations, or laws are discussed.

The Idaho Department of Environmental Quality (I-DEQ) has oversight for implementing and enforcing the rules of the Clean Air Act and the Clean Water Act. Due to the small size of the Aurora and not requiring water for cooling or to release emissions to the air, there are no permits required to ensure the Aurora INL site preparation and operation conforms with the I-DEQ regulations surrounding air and water quality.

  

# 3 PROJECTED IMPACTS

The purpose of this chapter is to provide information on the relevant environmental topic areas for the Aurora INL site, which are as follows:

- Land use
- Ecological resources
- Historic and cultural resources
- Air resources

## 3.1 Land use

### 3.1.1 Site, vicinity, region and onsite impacts

#### *3.1.1.1 Zoning information*

The Aurora is sited on leased land for 99 years from the date of initial operations as per the Site Use Permit. The Site Use Permit was granted to Oklo Inc. on September 26, 2019.

#### *3.1.1.2 Land use classification conversions*

All candidate sites are located on greenfield sites surrounding the MFC.

#### *3.1.1.3 Disruptions to the accessibility of public or private land or water resources*

The Aurora INL site is on land controlled by the DOE. The Aurora powerhouse does not use any water other than for incidental human use, which could be brought onsite and does not need be accessed from a local water line. Thus, the site does not block accessibility to public or private land or water resources. Due to access to the land being controlled by the DOE, there are no subsistence activities that happen on any of the candidate sites. The DOE does allow access to certain areas of the INL Site for the Shoshone-Bannock tribal members; the Aurora INL site does not disrupt this access.

#### *3.1.1.4 Land disturbance and disposition of spoils*

As shown in Table 3-1, the Aurora INL site occupies approximately 43,560 $ft_2$, which is about 1 acre of land, and the disturbed area on the site is expected to be less than 0.3 acres. Due to the small size of the site and minimal interaction with the environment, there is no expected impact on the use of the surrounding land. The disturbance of the land for the Aurora powerhouse is the main adverse environmental effect that cannot be avoided for this project. The use of the land for the Aurora powerhouse is not expected to impact the long-term productivity of the land.

*Table 3-1: Land usage for the Aurora INL site*

| Disturbed land | Area (sq. ft.) |
|---|---|
| Aurora powerhouse | 4500 |
| Parking lot | 2000 |
| Site driveway | 4000 |
| Temporary facilities | 500 |

  

| | |
|---|---|
| **Site total** | **43560** |

#### *3.1.1.5 Expansion requiring additional land*

There is no intention to expand the Aurora INL site.

### 3.1.2 Transmission-line corridors and other offsite areas

As can be seen in Figure 3-1, transmission lines run nearby MFC and thus nearby all candidate sites. The Aurora will generate between 1-2 MW electric. Due to the relatively small amount of power generated by the Aurora and the existing infrastructure available, no further information surrounding environmental impacts of additional transmission lines is provided.

  


*Figure 3-1: Electric power transmission lines and roads nearby the candidate sites [2]*

  

## 3.2 Ecological resources

### 3.2.1 Ecoregion

Ecoregions are areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources [3]. All candidate sites are part of the Eastern Snake River Basalt Plains. The Eastern Snake River Basalt Plains are described as the following:

> …shallow, stony soils that are unsuitable for cultivations. Only small areas have soils deep enough to be farmed under sprinkler irrigation. Rangeland is widespread and contrasts with the cropland of Ecoregions 12d, 12e, and 12i. Potential natural vegetation is mostly sagebrush and bunchgrass. It is cool enough to have some regeneration capacity and still contains native plants unlike Ecoregion 12h. Eastern parts of Ecoregion 12g are higher and more continental than the west. [4]

The unique characteristics of the ecoregion, farmland and the natural sagebrush vegetation, will not be impacted by construction and operation of the Aurora. Figure 3-3 shows sagebrush habitat in more detail.

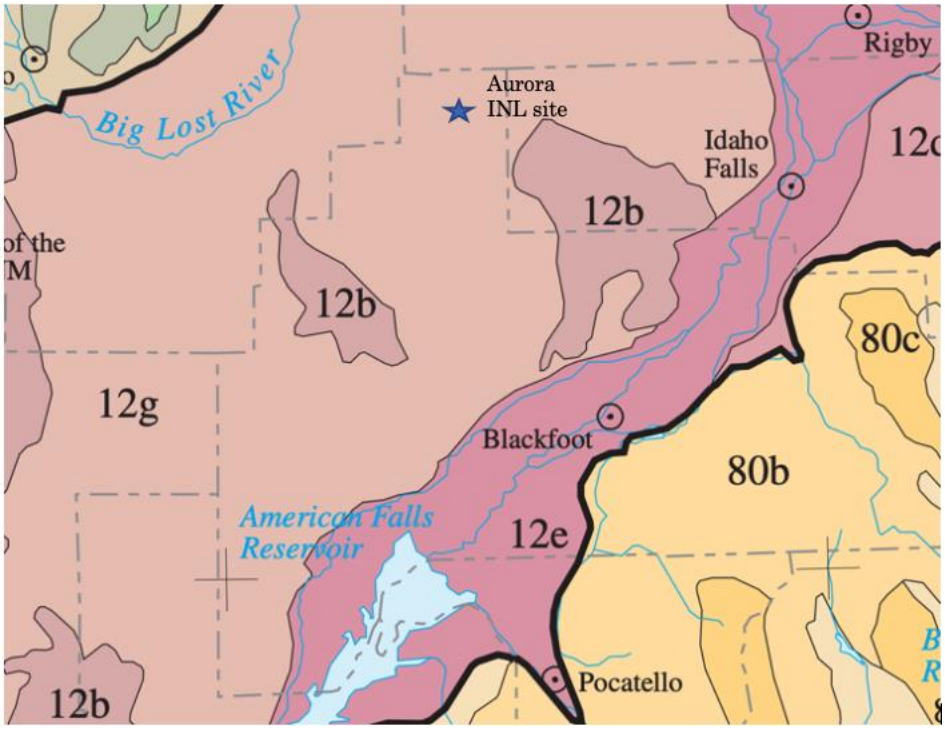


*Figure 3-2: Ecoregion at the site and vicinity [4]*

### 3.2.2 Terrestrial habitats on or adjacent to the site

The main ecosystem in the region is sagebrush as is described in the ecoregion as part of Section 3.2.1 and can be seen in Figure 3-3. Figure 3-4 shows that none of the candidate sites would require removal of sagebrush. The sagebrush habitat information comes from the

  

Greater Sage-grouse Candidate Conservation Agreement between the DOE and the U.S. Fish and Wildlife Service [5].

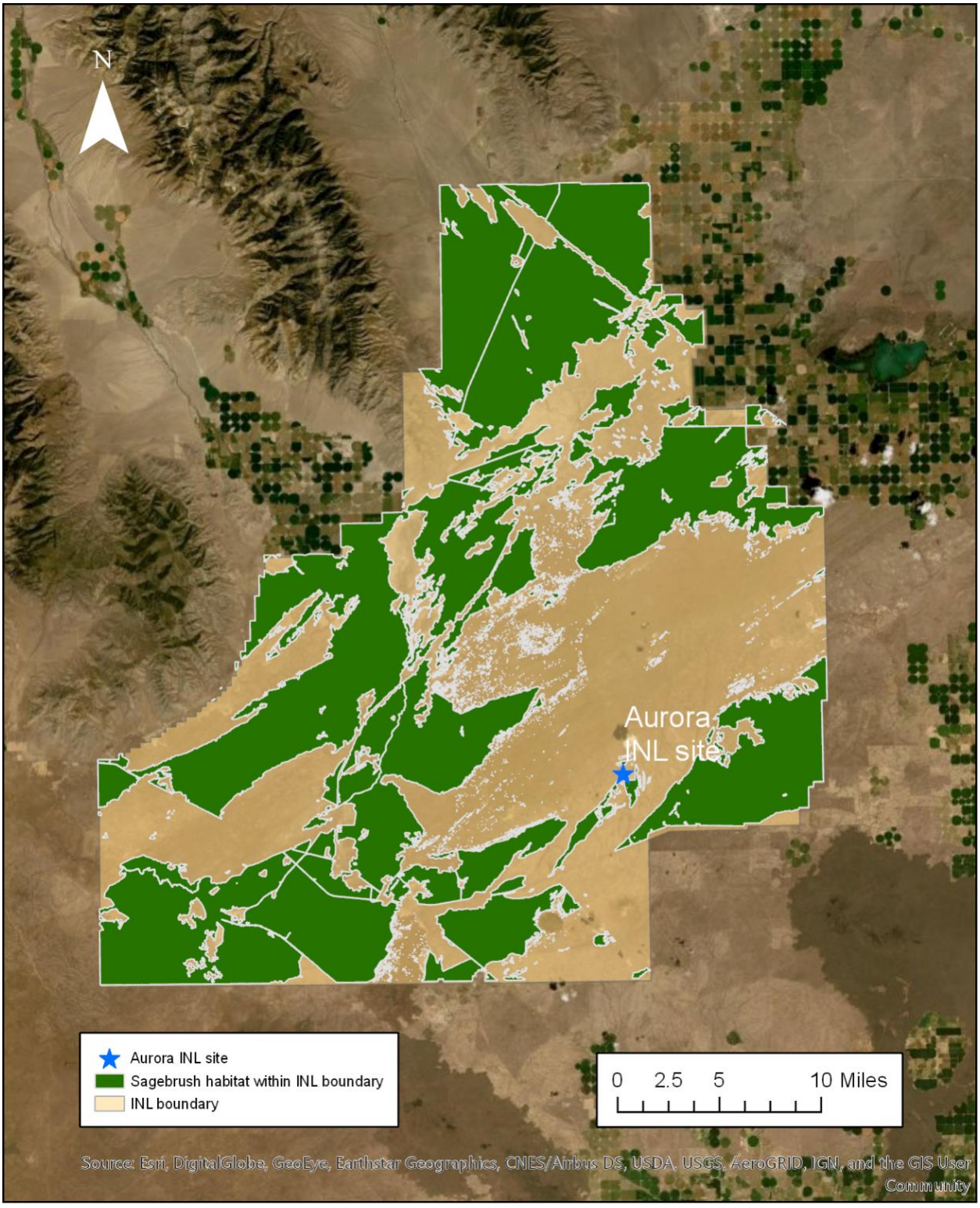


*Figure 3-3: INL sagebrush habitat [5]*

  

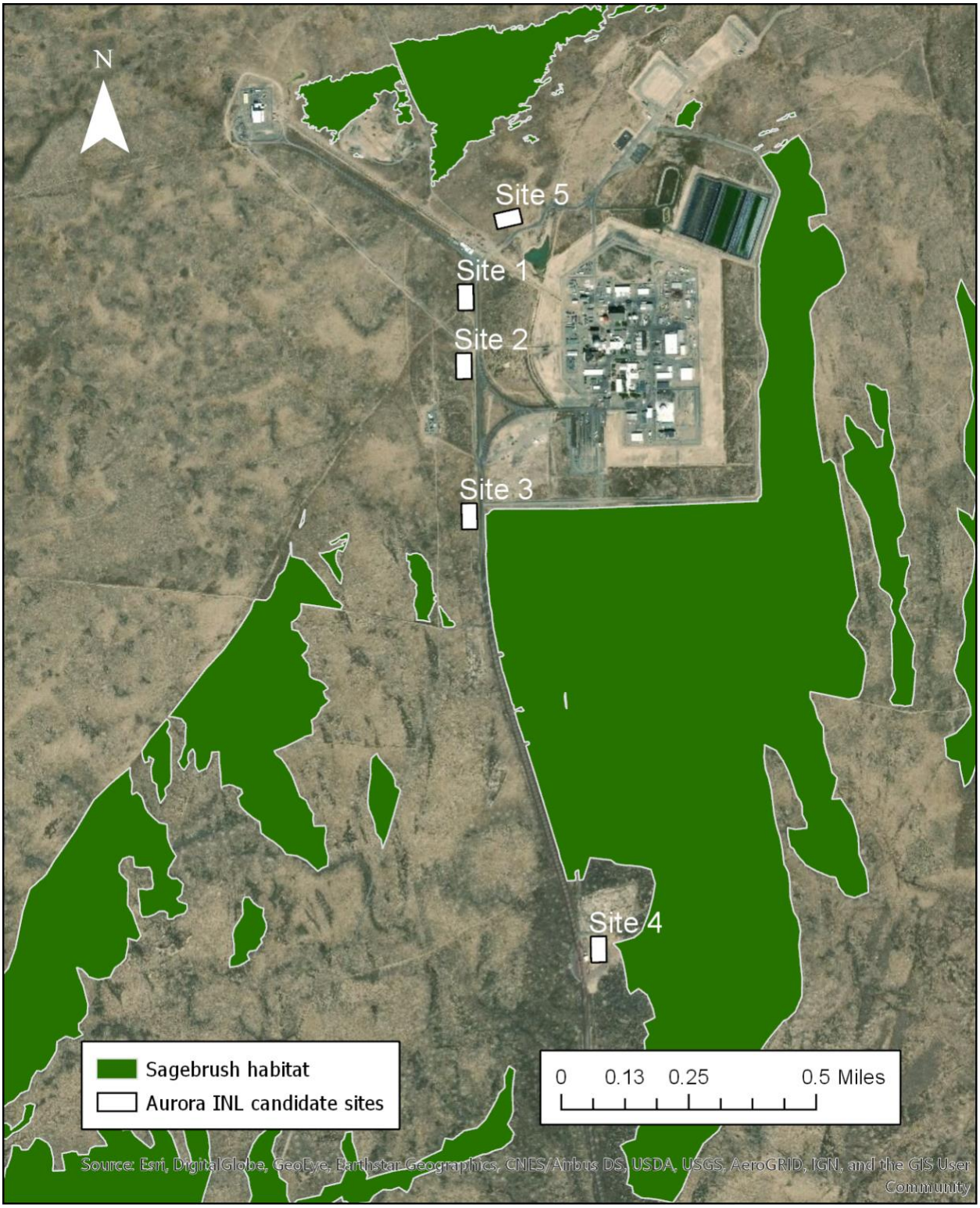


*Figure 3-4: Sagebrush habitat nearby to the Aurora INL site [5]*

  

## 3.3 Historic and cultural resources

### 3.3.1 Cultural background

The INL Site has a cultural heritage of at least 13,500 years of human occupation, with prehistoric and historic archeological finds. There are also historic and cultural resources from the Oregon Trail and historic properties from the World War II timeframe at the INL Site [6]. The INL Site including the Aurora INL site are located in a region of ancestral land for the Shoshone-Bannock tribes.

### 3.3.2 Historic and cultural resources at the site and in the vicinity

INL has a Cultural Resource Management program that includes the effects of activities on cultural resources, management responsibility, and overall management of cultural resources [7]. The Cultural Resource Management program includes methods to follow Section 110 of the National Historic Preservation Act to identify, research, and protect historic properties. There are ongoing efforts to inventory the cultural resources found at the INL Site. Over 800 square miles have been inventoried by anthropologists for archaeological sites resulting in more than 3,000 resources discovered by early 2020. As a means of documenting and preserving the heritage and landscape of the region, INL has authored many Heritage Documentation and Historic Engineering Survey (HAER) reports.

Over 300 buildings at the INL Site have been identified as historic. One of the historical sites documented though HAER reports includes the nearby Experimental Breeder Reactor II, within the MFC. No historic or cultural resources are identified to be impacted by the Aurora INL site.

## 3.4 Air resources

### 3.4.1 Climate and meteorological information source

There is no impact of the Aurora on local climate, nor are local climate or meteorological effects important for any operational considerations or other safety or emergency response characteristics for the Aurora, including for instance atmospheric dispersion characteristics. The main meteorological monitoring for the Aurora INL site will come from the National Weather Service. There is also an INL National Oceanic Atmospheric Administration weather center that may be used as a resource for meteorological monitoring.

### 3.4.2 Potential climate change in the affected region

As climate change impacts continue, Idaho may experience snowpack decreasing as average temperatures increase, resulting in less water availability in the summer [8]. The candidate sites are not near snowpack fed water bodies, and the Aurora requires minimal water resources. Thus, the Aurora will not be directly impacted by less water availability. Due to climate change surrounding the Aurora INL site, there may be an increased likelihood for fires as temperatures and dryness increase. Oklo Power, as part of its site commitments in Chapter 1, “Site envelope and boundary,” of Part II, minimizes fire risk by clearing brush within 30 feet of the Aurora powerhouse. This results in the Aurora INL site being a minimal wildfire risk, regardless of potential for changes in drought characteristics of the area.

  

# 4 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

The primary purpose of siting the first Aurora at INL is to build and operate a first-of-a-kind commercial advanced fission plant. Thus, no analysis will be provided for environmental impacts of alternative power generation sources to the Aurora. Instead, the ultimate heat sink alternatives are analyzed for the Aurora.

## 4.1 No action alternative

If Aurora is not built at the INL Site, then the first Aurora will be built at another location. The INL has resources and expertise that support the objective of the first Aurora implementation of optimizing the design, construction, and operation of the facility.

## 4.2 Impacts of ultimate heat sink alternatives

The ultimate heat sink for the Aurora is air. The alternative is rejecting the heat to water. However, it is generally acknowledged that using dry cooling is less environmentally impactful than using water, especially if the heat source does not emit greenhouse gases [9]. By using air as the ultimate heat sink, the Aurora is able to site in areas without water resources. Since no water is needed to cool the Aurora, the facility does not impact the aquatic ecology, eliminates possibility of fish kills, and minimizes possible coastal or water bank erosion. The air-cooling option is less environmentally impactful than a water heat sink alternative. It should also be noted that the atmospheric conditions typically found in the area lead to relatively efficient heat rejection to space from the air by radiative heat transfer, so it is expected that a sizable fraction of heat will not heat nearby air and will instead transfer to space, further reducing even the minimal nearby air heating.

  

# 5 SUMMARY OF IMPACTS

## 5.1 Irreversible and irretrievable commitments of resources

There are few irreversible and irretrievable commitments of resources. The incredibly small footprint of the site and incredibly high energy density of fission power mean that of any power source, the commitment of resources for the power plant is almost minimal. Of the few irreversible and irretrievable commitments of resources, none have a substantial impact on the environment due to their small scale.

## 5.2 Benefits and cost

All of the sites are equivalent in terms of economic, technical, and other benefits and costs. Therefore, this section focuses on describing the benefits and costs of the project versus the no action alternative.

### 5.2.1 Benefits

The Aurora is designed to provide clean, reliable, affordable power to microgrid or off-grid areas currently experiencing energy poverty, pollution, or both. These are generally areas with high power costs and limited power availability, and the NRC prioritizes applications for these areas.[4]

This first-of-a-kind Aurora plant will be an important example for communities considering deploying the plant to provide them with power. Experience from building and operating the plant will prove out certain operational and cost expectations.

This combined license application is novel, in a number of ways, in order to bring a new scale of dispatchable power, a new technology, a new operational model, and novel safety characteristics to reality. The purpose of bringing the Aurora to market through this combined license application is to improve social and environmental justice.

The Aurora will also create approximately 40 temporary jobs and 15 permanent jobs in southeast Idaho. The Aurora will also mark significant initial steps towards the development and deployment of advanced reactors to help society decarbonize, and reverse climate change.

Climate change is a defining challenge of our time, with overwhelming social and environmental costs. The human and environmental costs of climate change are intertwined; the decreasing health of the environment has negative impacts on human access to clean water, food, and housing. Climate change is causing deserts to expand, snow and ice packs to decrease, sea levels to rise, the acidification and warming of the oceans, and extreme weather events to become more severe and more common. Climate change is irreversibly changing ecosystems, resulting in an extinction crisis. It is causing habitats to be lost or degraded, resulting in some species no longer being able to survive in what was previously their home. The environmental impacts due to climate change relate directly to human health, resulting in less access to water, reduction in crop production, reduction in fish populations, and communities having to abandon

[4] According to 10 CFR 50.43(b), "the Commission will give preferred consideration…for facilities to be located in high cost power areas in the United States;"

  

their homes due to events such as fires and droughts. Climate change has the greatest impact on those who are socioeconomically disadvantaged, a population that is disproportionately women and children, who do not have as much economic opportunity or means to relocate in the case of a devastating event. Climate refugees already exist in the U.S. and the dislocating effects of climate change are expected to become more common.

Carbon dioxide is the main motivating force behind the greenhouse effect, the cause of climate change. Human activities have increased atmospheric carbon dioxide by a third since the industrial revolution. The electricity and heat generation sector contribute the most to global emissions due to the burning of fossil fuels.

Oklo is motivated to develop clean energy generation sources such as the Aurora to mitigate the social and environmental impacts of climate change. Clean energy, such as that generated by the Aurora, reduce further climate change impacts while providing a solution to lessen the consequences of inevitable climate change effects. Clean energy mitigates further climate change impacts by avoiding the emissions that would be released from the burning of fossil fuels. At the same time, clean energy reduces the social impacts of climate change by providing power for tools such as air conditioning to manage heat waves, desalination for ensuring access to clean water, and controlled-environment agriculture to adjust to droughts.

### 5.2.2 Costs

The financial costs of the Aurora are borne by Oklo Power.

## 5.3 Cumulative impacts

Title 40, "Protection of environment," of the *Code of Federal Regulations* Section 1508.7, "Cumulative impact," gives the following definition:

> *Cumulative impact* is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The Aurora has a positive impact on air quality by avoiding emissions compared with similarly sized emitting power sources. The Aurora has a small footprint and requires little water. The Aurora is also designed to use minimal staffing. In all, the environmental impacts of the Aurora INL site are small. Therefore, its contribution to the cumulative negative impact on the environment is also small, which are outweighed by its positive impacts on the environment. At future Aurora sites, the cumulative environmental impact of the plant on a region is expected to be even more positive due to voided emissions by replacing emitting power sources, and substantially lowered costs of electricity for the region.

## 5.4 Conclusion

This first-of-a-kind Aurora plant will be an important demonstration of the Aurora's abilities to provide power, and experience from building and operating the plant will prove out certain cost and operational expectations. The Aurora is designed to provide clean, reliable, affordable

  

power to microgrid or off-grid areas currently experiencing energy poverty, pollution, or both. These areas generally have high costs of power cost, and the NRC prioritizes applications for facilities in these areas of the United States. Additionally, the Aurora can provide the same product to many industrial customers connected to the traditional electric grid also desire enhanced reliability through an always-on, locally-sourced energy alternative.

This combined license application is novel in a number of ways in order to bring a new technology and power plant scale, operational model, and novel safety to reality. The purpose of bringing the Aurora to market through this application is fundamentally to improve social and environmental justice. One way in which the Aurora will achieve this is by taking significant initial steps towards the development and deployment of advanced reactors to help society decarbonize, and reverse climate change. Decarbonization and providing for the availability of power is the foundation for both addressing environmental issues as well as bringing those in energy poverty into a place of comfort and prosperity.

Climate change is a defining challenge of our time, with overwhelming social and environmental costs. The human and environmental costs of climate change are intertwined; the decreasing health of the environment has negative impacts on human access to clean water, food, and housing. Climate change is causing deserts to expand, snow and ice packs to decrease, sea levels to rise, the acidification and warming of the oceans, and extreme weather events to become more severe and more common. Climate change is irreversibly changing ecosystems, resulting in an extinction crisis. It is causing habitats to be lost or degraded, resulting in some species no longer being able to survive in what was previously their home. The environmental impacts due to climate change relate directly to human health, resulting in less access to water, reduction in crop production, reduction in fish populations, and communities having to abandon their homes due to events such as fires and droughts. Climate change has the greatest impact on the socioeconomically disadvantaged, a population that is disproportionately women and children, who do not have as much economic opportunity or means to relocate in the case of a devastating event. Climate refugees already exist in the U.S. and the dislocating effects of climate change are expected to become more common.

Carbon dioxide is the main motivating force behind the greenhouse effect, the cause of climate change. Human activities have increased atmospheric carbon dioxide by a third since the industrial revolution. The electricity and heat generation sector contribute the most to global emissions due to the burning of fossil fuels.

Oklo is motivated to develop clean energy generation sources such as the Aurora to mitigate the social and environmental impacts of climate change. Clean energy, such as that generated by the Aurora, reduce further climate change impacts while providing a solution to lessen the consequences of inevitable climate change effects. Clean energy mitigates further climate change impacts by avoiding the emissions that would be released from the burning of fossil fuels. At the same time, clean energy reduces the social impacts of climate change by providing power for tools such as air conditioning to manage heat waves, desalination for ensuring access to clean water, and controlled-environment agriculture to adjust to droughts.

In summary, due to the Aurora's small footprint, flexible siting, use of dry-air-cooling, and relatively small operational requirements, there is little environmental impact to the region from either the site preparation or operation of the facility, and the overall environmental impact is positive.

  

# 6 BIBLIOGRAPHY

[1] J. Davis and NRC, "Preparation of Environmental Reports for Nuclear Power Stations," Regulatory Guide RG 4.2, Sep. 2018.
[2] U.S. Department of Homeland Security, "Electric Power Transmission Lines." [Online]. Available: https://hifld-geoplatform.opendata.arcgis.com/datasets/electric-power-transmission-lines?geometry=-112.916,43.527,-112.426,43.614. [Accessed: 04-Feb-2020].
[3] G. Griffith and J. Omernik, "Encyclopedia of Earth Ecoregions of Florida." [Online]. Available: https://www.nrc.gov/docs/ML1219/ML12193A351.pdf. [Accessed: 05-Feb-2020].
[4] NRC, "Ecoregions of Idaho," Nuclear Regulatory Commission.
[5] Department of Energy - Idaho and US Fish and Wildlife Service, "Candidate Conservation Agreement - Sagebrush Habitat 2016," 2016.
[6] G. Griffith and S. Hoiland, "INL Site Conditions and Properties," Idaho National Laboratory, INL/EXT-15-36721, 2015.
[7] Idaho National Laboratory, "Idaho National Laboratory Cultural Resource Management Plan." U.S. Department of Energy, Feb-2016.
[8] EPA, "What Climate Change Means for Idaho," 2016.
[9] Union of Concerned Scientists, "Water for Power Plant Cooling." [Online]. Available: https://www.ucsusa.org/resources/water-power-plant-cooling. [Accessed: 04-Feb-2020].
[10] Department of the Interior, "U.S. Fish and Wildlife Geospatial Services Home," *USFWS Geospatial services*. [Online]. Available: https://www.fws.gov/gis/data/national/. [Accessed: 04-Feb-2020].
[11] J. W. Connelly, M. A. Schroeder, A. R. Sands, and C. E. B. R. work(s), "Guidelines to Manage Sage Grouse Populations and Their Habitats," *Wildlife Society Bulletin*, vol. 28, no. 4, pp. 967–985, 2000.
[12] Environmental Surveillance, Education, and Research Program, "Active Sage Grouse 2018," 2018.
[13] International Building Code Council, "International Building Code: 1803.5.4 Ground-water table," 2018.
[14] USGS NWIS Mapper Team, "National Water Information System: Mapper."
[15] N. O. and A. A. US Department of Commerce, "What is a wetland?" [Online]. Available: https://oceanservice.noaa.gov/facts/wetland.html. [Accessed: 04-Feb-2020].
[16] U.S. Fish and Wildlife Services, "National Wetlands Inventory," *Wetlands*. [Online]. Available: https://www.fws.gov/wetlands/. [Accessed: 04-Feb-2020].

  

# APPENDIX A: ENVIRONMENTAL COMMITMENT SET

The scope outlined by this methodology identifies impact categories that apply to the plant. This appendix discusses impact categories identified in the methodology to apply to the Aurora. Some of these impact categories discussed are mitigated inherently by the Aurora design and do not require specific environmental commitments. The impact categories not mitigated inherently by the Aurora design are mitigated through environmental commitments. Environmental commitments are commitments regarding siting to avoid impacts. These commitments are then evaluated on a site-specific basis in the Appendix on whether they are inherently met by the site or candidate sites selected, or whether additional analysis is needed regarding that commitment in the Environmental Report.

The following environmental topic areas are evaluated in this methodology:

- Co-located units
- Critical habitat
- Floodplain
- Jobs
- Offsite construction aquatic ecosystem
- Population
- Prime or unique farmland
- Site area
- Site preparation worker housing
- Special land use
- Surface or near surface water
- Wetland

## A.1 Co-located units commitment

### A.1.1 Co-located units commitment objective and basis

Co-located units are located either on the same site or on adjacent, contiguous sites, and that share most of the following emergency planning and siting elements. As discussed in RG 4.2, the concern surrounding dose to construction workers is from any operational co-located reactors. The Aurora is not designed to have more than one reactor within a site. There is no dose to workers outside the powerhouse itself.

  

**Co-located units commitment:** The Aurora is not designed to have more than one reactor within a site. There is no dose to workers outside the powerhouse itself. If the Aurora powerhouse is designed to be placed on the same site as a currently operating nuclear reactor, and also within any radiation areas of that reactor, the estimated annual dose to construction workers will be evaluated and mitigating measures will be put into place to minimize the total dose to construction workers. This further analysis will be included in the Environmental Report.

### A.1.2 Co-located units commitment Aurora INL site evaluation

Since the Aurora is not being placed in the radiation area of a currently operated reactor, the proposed environmental commitment is met, and no further information is required to be provided in the Environmental Report.

## A.2 Critical habitat commitment

### A.2.1 Critical habitat commitment objective and basis

Because of the small size and flexibility of siting of the Aurora, Oklo can site the Aurora in a way to not impact threatened or endangered species or their habitat. The objective of the critical habitat commitment is to further commit Oklo to upholding the health of the ecosystem.

**Critical habitat commitment:** Additional analyses will be performed if a site is proposed to be constructed in critical habitat, as judged by the U.S. Fish and Wildlife Services critical habitat data. This further analysis will be included in the Environmental Report.

### A.2.2 Critical habitat commitment Aurora INL site evaluation

There are no endangered or threatened species with critical habitat near the Aurora INL site, shown in Figure A-1. The critical habitat information comes from the U.S. Fish and Wildlife critical habitat ecosystem information [10]. The yellow-billed cuckoo is considered a threatened species and the bull trout is considered a vulnerable species. The closest critical habitat to any of the candidate Aurora INL sites is approximately 50 miles away.

Since the Aurora INL site is not within a critical habitat, the environmental commitment is met by default and no further information on critical habitat is provided in the Environmental Report.[5]

[5] One local consideration considered additionally to the commitment and outside of the environmental report requirements is that the Aurora INL site is in a region where there are habitats for the sage grouse, which is considered a near threatened species. As can be seen in Figure A-2, there are no known active sage grouse leks in the immediate vicinity of any of the candidate Aurora INL sites as of 2018; a lek is a group of male sage grouse that come together to perform a mating ritual. An area is considered active if it was attended by two or more male sage-grouse in two or more of the previous 5 years, though the data shown in Figure A-2 includes sites where two or more male sage grouse visited for less than 2 years [11].

  

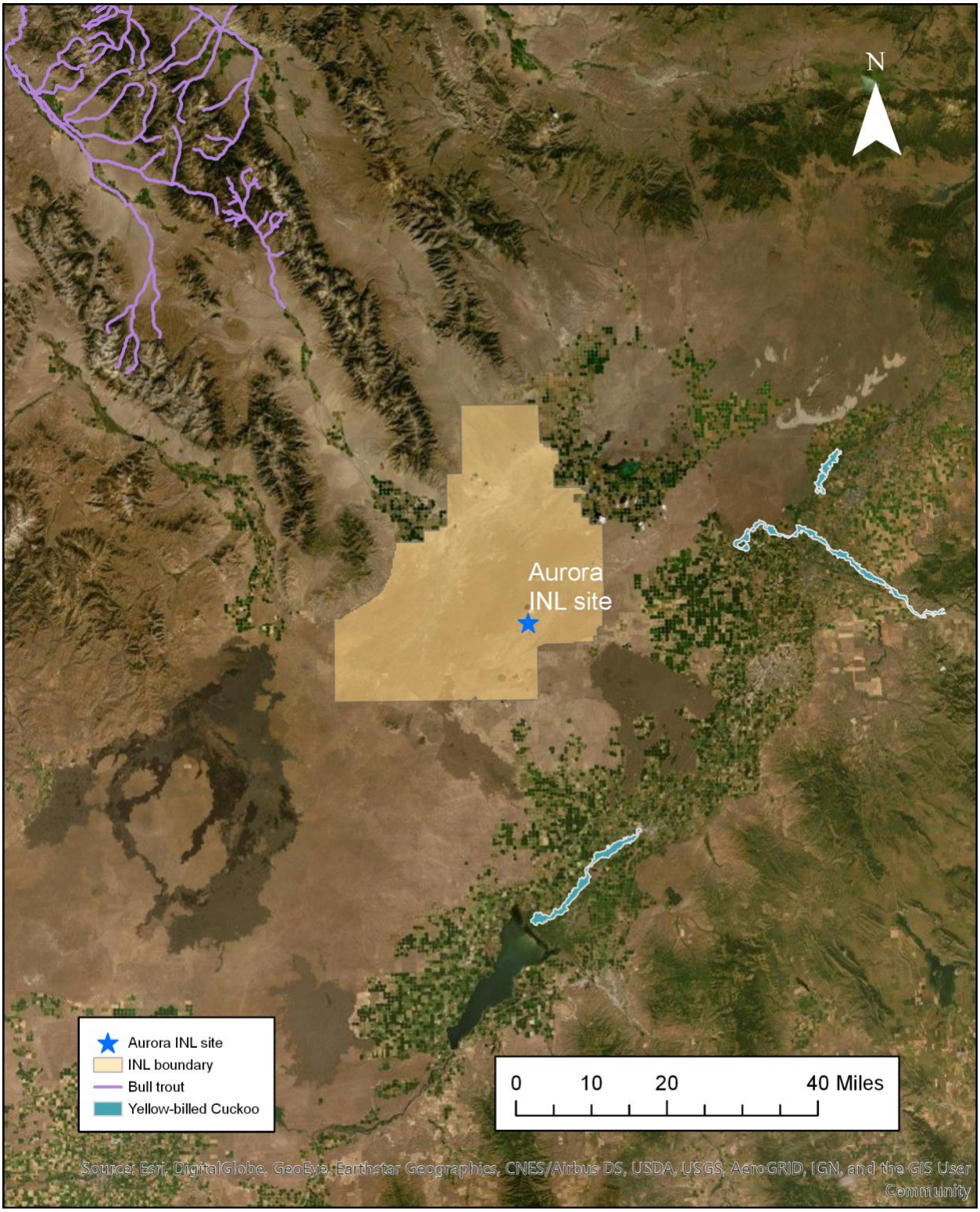


*Figure A-1: Habitats for bull trout and yellow-billed cuckoo [10]*

  

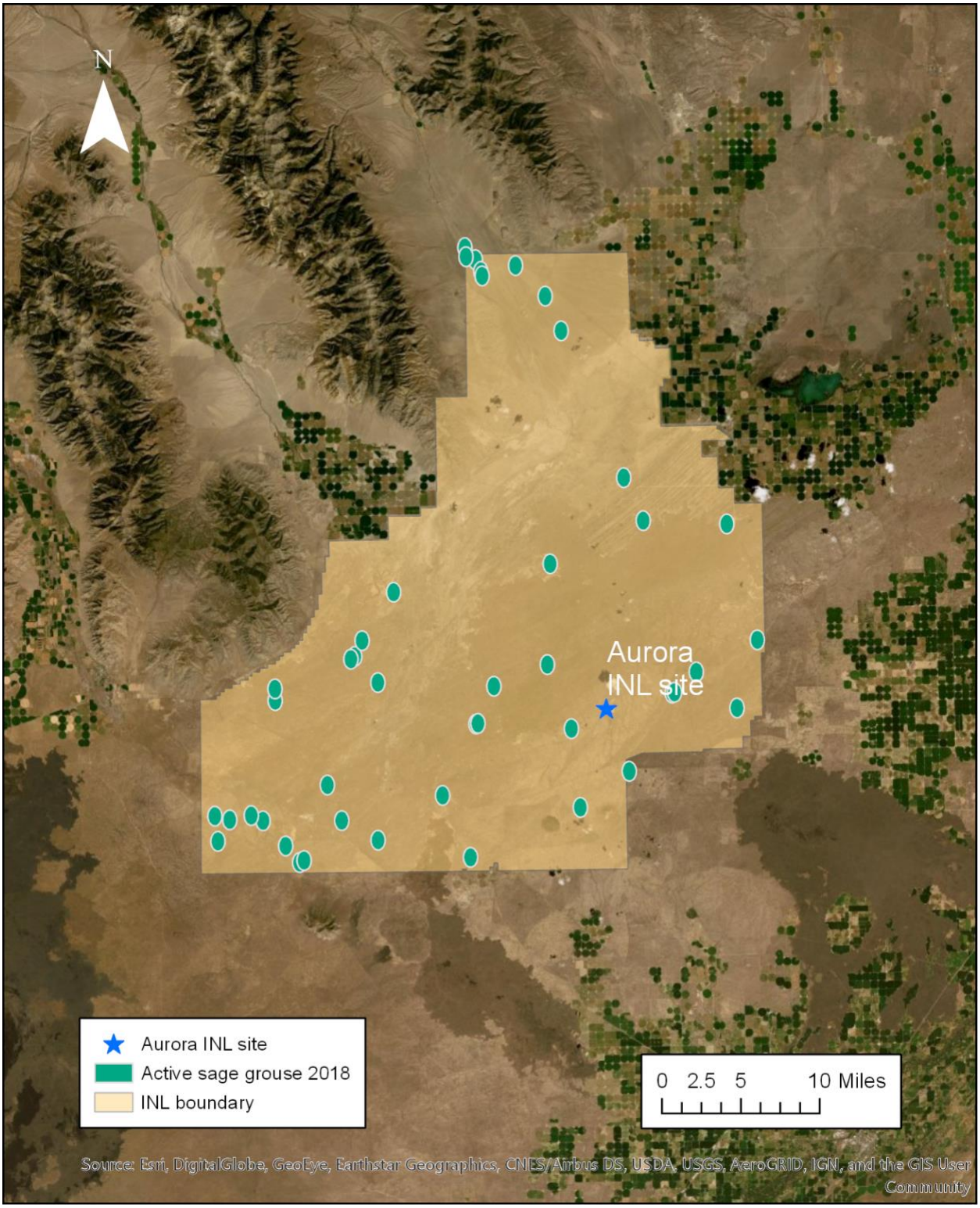


*Figure A-2: Active sage grouse lek locations within INL [12]*

  

## A.3 Floodplain commitment

### A.3.1 Floodplain commitment objective and basis

Because of the small size and flexibility of siting of the Aurora, Oklo can site the Aurora in a way to not impact a floodplain. The objective of the floodplain commitment is to further commit Oklo to ensuring floodplains are not negatively impacted.

Floodplains provide important ecosystem services protecting the natural and human habitat. Some floodplain benefits include flood storage and erosion control, water quality maintenance, groundwater recharge, biological productivity, and habitat for fish and wildlife. While the Aurora site is small and will minimally impact the environment, Oklo will ensure the site does not impact the important role of floodplains by performing additional analysis if siting within a 100-year floodplain. Further analyses will also be performed if any offsite construction takes place in a floodplain.

**Floodplain commitment:** Additional analyses will be performed of how the site could impact a floodplain if the site is within a designated 100-year floodplain. Mitigating measures to minimize impact to the floodplain will be implemented if appropriate. If transmission or any other offsite construction built due to the site is in a 100-year floodplain, the environmental impacts and implementing measures, as needed, will be analyzed. This further analysis will be included in the Environmental Report.

### A.3.2 Floodplain commitment Aurora INL site evaluation

As can be seen in Figure A-3, the Aurora INL site is approximately 12.5 miles from the closest part of the closest 100-year floodplain. As the Aurora INL site is in a 100-year floodplain, the commitment is met by default and no further information on floodplains is discussed in the Environmental Report.

  

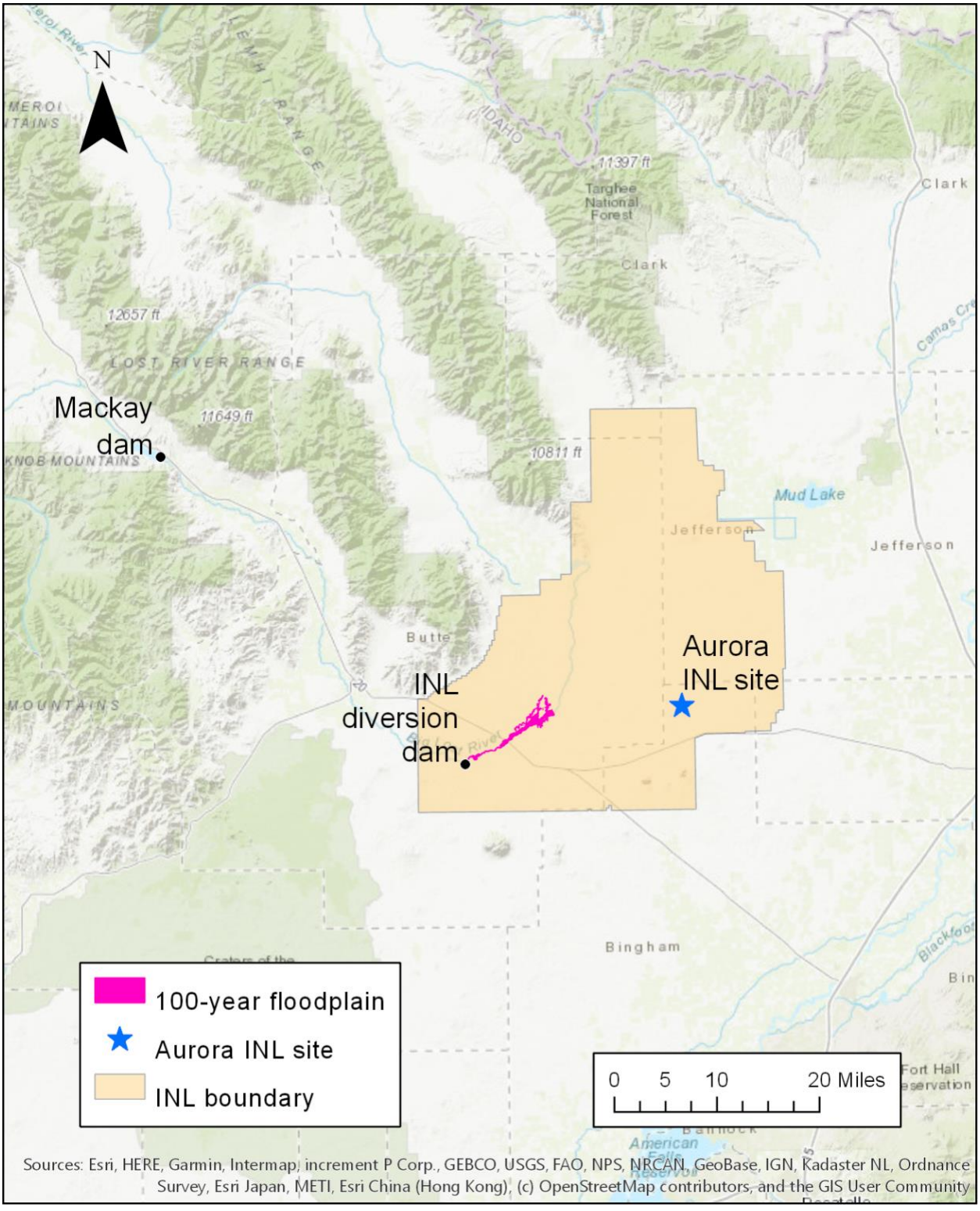


*Figure A-3: 100-year floodplain near the Aurora INL site*

  

## A.4 Jobs commitment

### A.4.1 Jobs commitment objective and basis

The objective of the jobs commitment is to ensure that Aurora has a positive impact on the local community and economy.

The economic considerations of the Aurora are almost entirely positive. Tax revenues generated from the plant, as well as additional employment, are positive factors associated with the construction and operation of a clean power plant in a community.

Due to the small total employment required for either site preparation or operation, the Aurora generally has small but positive direct or indirect impacts on employment, income, or tax revenue except in very remote locations. The approximately 15 full-time jobs provided by the Aurora are available to local residents with a high school education, and are comfortable, long-term, non-hazardous, well-paying jobs. It is expected that in areas where the Aurora replaces diesel generators, the employees that formerly worked with the diesel generators could work at the Aurora plant, causing no displacement of jobs. The Aurora is expected to be installed as part of the clean energy grid in remote and off-grid communities, of populations around 1,000 or more. As such, 15 full-time and well-paying jobs which are accessible without special education or extensive training requirements would not present an undue strain for a community of 1,000, especially as the employees are expected to be available locally.

There may be temporary construction employees for between 1-6 months while building the powerhouse. Oklo has analyzed potential impacts of up to 40 temporary construction workers on small communities and has determined that such a small number of temporary employees should not cause excess undue burden in even the smallest communities but may bring additional income to local commerce.

**Jobs commitment:** Because of the small number of total full-time jobs, and because the full-time jobs are considered both desirable as well as accessible to local residents without extensive education or training, the effects of jobs on the local community are expected to be positive both economically and socially. Therefore, no commitment is necessary to ensure positive effects for this aspect of the environmental evaluation, and jobs will not be evaluated on a site-specific basis.

## A.5 Offsite construction aquatic ecosystem commitment

### A.5.1 Offsite construction aquatic ecosystem commitment objective and basis

The Aurora is designed to preserve bodies of water by requiring water only for sanitary and incidental uses. The offsite construction aquatic ecosystem commitment extends this commitment to minimal impact on aquatic ecosystems to offsite construction. If any offsite roads or other infrastructure are constructed for the Aurora over a body of water, additional analyses will be performed to understand and minimize impact to aquatic biota.

**Offsite construction aquatic ecosystem commitment:** Additional analyses will be performed, and appropriate mitigating measures will be implemented, as needed, for impacts to aquatic biota in the case of offsite construction impacting a body of water. This further analysis will be included in the Environmental Report.

  

### A.5.2 Offsite construction aquatic ecosystem commitment Aurora INL site evaluation

No construction over a body of water is necessary to install or maintain transmission infrastructure between the Aurora INL site and the existing transmission infrastructure. Thus, the offsite construction aquatic ecosystem commitment is met by default and no further information is provided in the Environmental Report.

## A.6 Population commitment

### A.6.1 Population commitment objective and basis

The objective of the population commitment is to ensure the Aurora will not have any significantly negative impacts on infrastructure surrounding the site. Infrastructure includes traffic, road conditions, public services and utilities, housing, and education.

Due to the small size of the Aurora, and the use of prefabricated, shippable components, the jobs created for site preparation will be short, generally less than 6 months. Due to the short timeframe associated with the Aurora site preparation and construction, it is likely few persons hired from out of town will permanently reside in the region surrounding the Aurora site. Where available, local workers will be hired.

One significant consideration in these analyses for typical large power plants (~500x larger in output) is that they are sited in remote areas in order to provide power for larger cities or regions. The remote communities are unduly burdened for a benefit that is not largely theirs. The Aurora is specifically designed for remote communities, who will select their power solutions, and so distributed, smaller power sources can be considered "opt-in" for these communities.

During operations, the Aurora will employ approximately 15 local full-time personnel. As described in the "Jobs" evaluation, these jobs will not require extensive education or training, and are expected to be filled by local residents. In most of the remote and off-grid communities, there is a dearth of well-paying, reliable, non-hazardous jobs, and as such these jobs would be expected to be in demand from local residents.

To evaluate the community impacts due to a potential increase in population from the Aurora through a more quantitative analysis, Oklo examined a definition from the 1996 version of NUREG 1437. According to the 1996 version of NUREG-1437, a small increase in population is considered as anything less than a 5 percent increase in the region population.

An approximate maximum increase in the community due to the provision of these jobs can be estimated by assuming that all 15 jobs were filled by employees that move into the community and each are members of families of between 2-4 people, leading to an approximate average maximum population increase of 45 people. The expected likely permanent increase in population of a community is minimal to none, because the jobs are expected to be filled by local residents.

Forty-five people make up 5 percent of a 900-person community. Thus, a 45 person increase in the population would be considered small if the economically affected regional population is greater than 900. If the economically affected region population is greater than 900, then

  

possible migration of workers due to the Aurora would have negligible impact on community infrastructure including public water and power utilities, local health and fire services, schools, traffic, or impacts to roads.

**Population commitment:** The Aurora would generally be too large of a plant to power communities much smaller than 900 people, and as described, the Aurora plant is anticipated to employ local residents. As such, it is expected that there would be no significant strain to the local infrastructure of any plausible customer community by provision of 15 full-time jobs. Also, because the Aurora will only be built in communities that have elected to sign power purchase agreements with Oklo, there are not situations like for large plants where siting is unduly imposed on a community in order to provide power elsewhere. Therefore, no site-specific commitment regarding population and infrastructure is necessary for the Aurora, and no site-specific evaluation is needed.

## A.7 Prime or unique farmland commitment

### A.7.1 Prime or unique farmland commitment objective and basis

Because of the small size and flexibility of siting of the Aurora, it can be sited in a way to not impact a unique farmland. The objective of the unique farmland commitment is to further commit to ensuring unique farmlands are not negatively impacted.

Prime or unique farmlands are defined in Title 7, "Agriculture," to the *Code of Federal Regulations* Section 657.5, "Identification of important farmlands," and that definition is intended for this commitment. Oklo values minimizing impact to food production and will take prime or unique farmland into consideration when evaluating a site. In fact, Oklo expects to consider siting to support farming and fresh local food, for instance vertical gardens for fresh food for local communities.

**Prime or unique farmlands commitment:** Further investigations will be performed for a site if a proposed Aurora site is on land considered by the United States Department of Agriculture as prime or unique farmlands. This further analysis will be included in the Environmental Report.

### A.7.2 Prime or unique farmland commitment Aurora INL site evaluation

The Aurora INL site is within the INL Site and is therefore not on prime or unique farmlands. Thus, the prime or unique farmlands commitment is met, and no further information is given on prime or unique farmlands in the Environmental Report.

## A.8 Site area commitment

### A.8.1 Site area commitment objective and basis

The objective of the site area commitment is to ensure that the Aurora site does not limit access to substantial amounts of land used for recreational or subsistence purposes such as hunting and gathering.

The Aurora site is generally expected to be approximately one acre in size, and the only restricted area is the Aurora powerhouse at less than 5,000 square feet in land area. The site

  

size may fluctuate depending on the specific characteristics of the area and so may be smaller or larger than one acre. The goal of using such an energy-dense fuel is to reduce use of land and resources while producing emission-free power. Oklo does not want to limit access to land important for hunting and gathering or recreational purposes.

**Site area commitment:** At approximately one acre, and because the Aurora site is designed to allow for natural movement of animals and humans outside of the Aurora powerhouse, no commitment is necessary to ensure that the Aurora site does not limit access to substantial amounts of land, and no site-specific evaluation is needed.

## A.9 Site preparation worker housing commitment

### A.9.1 Site preparation worker housing commitment objective and basis

The objective of the site preparation worker housing commitment is to ensure sufficient temporary housing resources for site preparation workers without undue strain to the local community resources.

Site preparation at the Aurora is expected to take between 1 and 6 months with an estimated average of 20 workers and an approximate maximum of 40 workers during the greatest period of employment. Due to the short duration of the site preparation period, it is not expected a significant portion of the site preparation workers will permanently relocate to the site. Further reducing the potential influx of workers during site preparation, local employees will be hired when possible. The expected customer communities of population 1,000 or greater have at least one hotel or motel, or resources for home rental, or could accommodate temporary mobile home housing for an average of 20 workers and up to 40 workers for a few months.

**Site preparation worker housing commitment:** This evaluation differs significantly from the historical concern with large LWR plants which may typically have thousands of workers on many-year-long construction projects. Because of the dramatically different impact for a small site with a short duration of construction, this concern is mitigated inherently, and no commitment or further site-specific evaluation is needed.

## A.10 Special land use commitment

### A.10.1 Special land use commitment objective and basis

The objective of the special land use commitment is to minimize any negative impact to special land use due to the construction of an Aurora.

Special land includes recreation areas, parks, tribal lands, designated wild and scenic rivers, and other areas of special designation. Special land areas are important spaces to communities, and Oklo will avoid negatively impacting these areas. The concern with siting most power plants near special land is aesthetic or for specific land conservation. The Aurora powerhouse is considered itself to be aesthetically interesting according to artistic online publications and other sources. In addition, because of the very small footprint of the plant and the very high energy density of advanced fission, impact to local special land use is expected to be minimal for the Aurora, and in particular in comparison to other power sources which obstruct viewshed and require large areas of land clearing, like solar thermal, solar photovoltaic, and wind turbines. In the case that an Aurora is invited to power a national park or a tribal land, for

  

instance, it would be considered preferable to emitting power sources on one hand, and preferable to any less energy dense power source on the other hand, because of the goal to reduce land use.

**Special land use commitment:** Because the Aurora uses the most energy dense power source, requires no water, does not produce emissions, and requires less land footprint area than many residential homes, there is not particular concern regarding negative impact on special lands versus alternative power sources. Therefore, no commitment is necessary, and no site-specific evaluation will be needed.

## A.11 Surface or near surface water commitment

### A.11.1 Surface or near surface water commitment objective and basis

Because the Aurora does not require cooling water, and because of the small size and flexibility of siting of the Aurora, it is more straightforward to choose a site in a way so as to not impact a watershed, surface water, or areas near surface water due to construction of the Aurora. The objective of the surface or near surface water commitment is to further commit to ensuring that these aquatic environments are not negatively impacted.

Understanding impacts to watersheds and groundwater flow for any new construction is important in understanding the overall environmental impacts. There are no effluents from the Aurora, nor does the Aurora use water for anything other than human sanitary or incidental use. The Aurora is a small site, at about an acre, that does not require significant topographic changes or significant surface paving. Thus, hydrologic or site drainage pattern changes due to the Aurora could only noticeably alter watersheds and groundwater flow if the site is in a particularly important hydrologic location.

**Surface or near surface water commitment:** The Aurora will implement a water monitoring program and perform further analyses to ensure surface or groundwater flow is not impacted by the facility if the groundwater-table is within 5 feet of the lowest floor level in the Aurora powerhouse or if there is a water body permanently present within the site boundary [13]. This further information will be included in the Environmental Report.

### A.11.2 Surface or near surface water commitment Aurora INL site evaluation

As can be seen in Figure A-4, the groundwater-table level is over 600 feet below the surface of the site. As can be seen in Figure A-3 and Figure A-5, there are no standing bodies of water on the Aurora INL site. The minor topographic changes due to construction of roads and the Aurora powerhouse at the site will not noticeably alter the drainage or hydrologic conditions of the area. The surface or near surface water commitment is met, thus no further information regarding impacts to the local hydrology is provided in the Environmental Report.

  

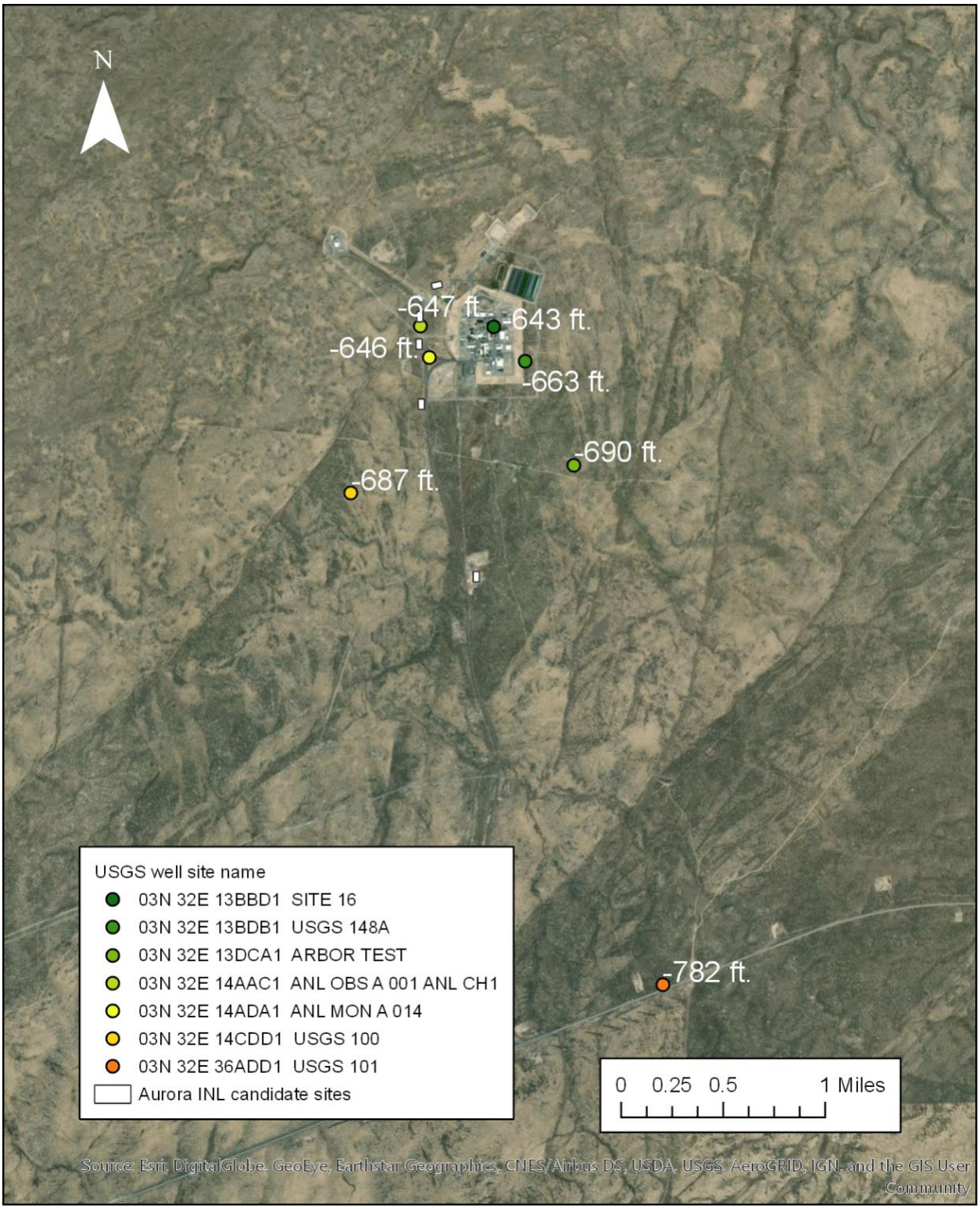


*Figure A-4: Groundwater level beneath the Aurora INL site [14]*

  

# A.13 Wetland commitment

## A.13.1 Wetland commitment objective and basis

Because the Aurora does not require cooling water, and because of the small size and flexibility of siting of the Aurora, it is more straightforward to choose a site in a way so as to not impact a wetland. The objective of the surface or near surface wetland commitment is to further commit to ensuring that these aquatic environments are not negatively impacted.

Wetlands are areas of land saturated with water [15]. Wetlands provide important ecosystem services protecting the natural and human habitat. Some of the ecosystem services include providing fish and wildlife habitat, protecting and improving water quality, and storing floodwaters. While the Aurora site is small and will minimally impact the environment, Oklo will ensure the site does not impact the important role of wetlands by performing additional analyses and generating mitigating measures if siting in a wetland. The site wetland evaluation will consider how the region surrounding the site may change during the life of the facility.

**Wetland commitment:** Additional analyses will be performed of how the Aurora site, and any associated offsite construction, could impact a wetland if the proposed site is in a wetland. This further analysis will be included in the Environmental Report.

## A.13.2 Wetland commitment Aurora INL evaluation

As shown in Figure A-6, the region surrounding the Aurora INL site does not have significant wetlands, as the INL Site is generally considered to be a high-desert environment [6]. None of the candidate sites are likely to become wetlands in their lifetime due to the dry regional climate and the MFC in particular being managed by INL. Due to none of the candidate sites being on a wetland or a site likely to become a wetland during the life of the facility, the Aurora INL site meets the wetland commitment and thus no further information is provided in the Environmental Report.

  

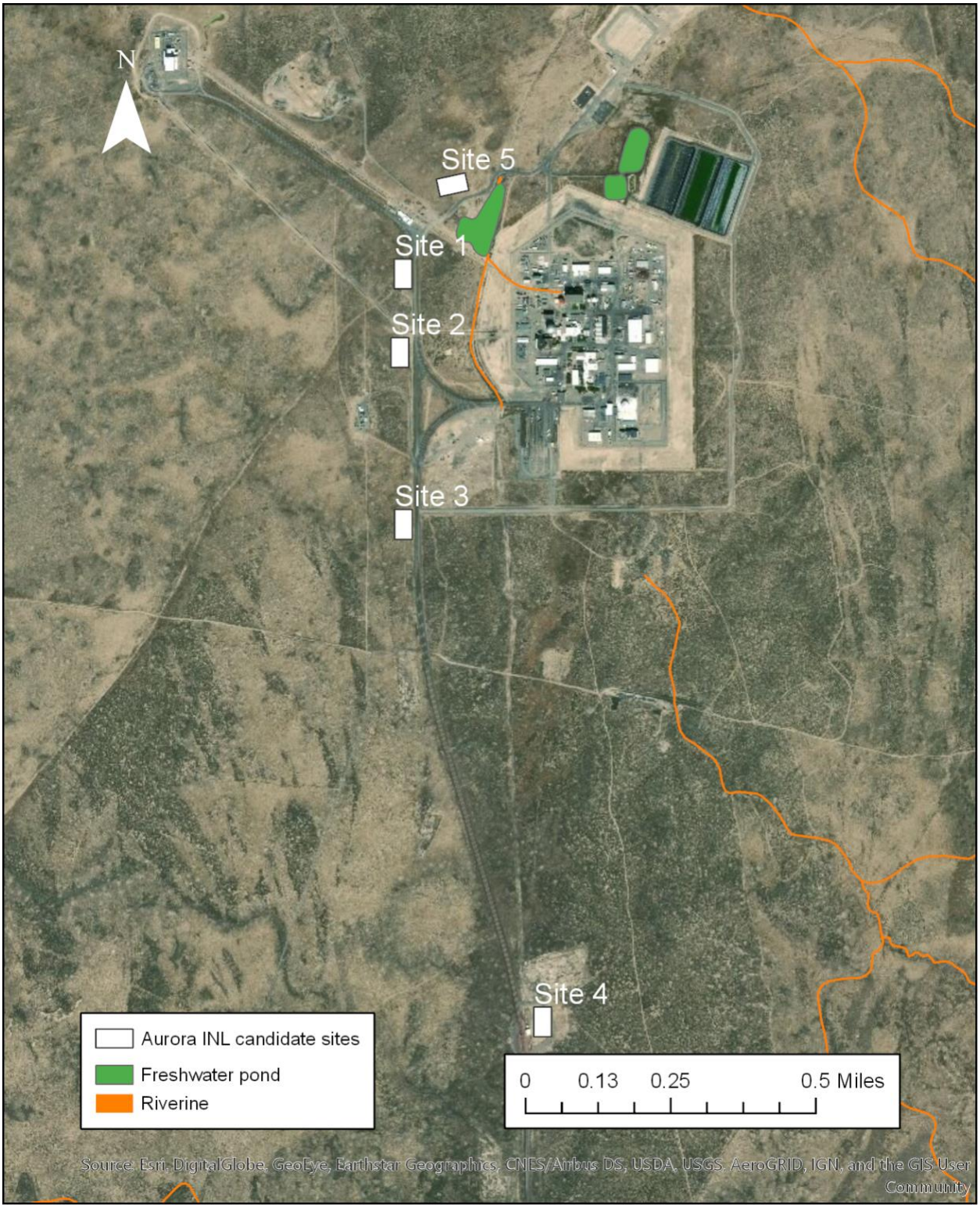


*Figure A-5: Wetlands in the vicinity of the Aurora INL site [16]*

  

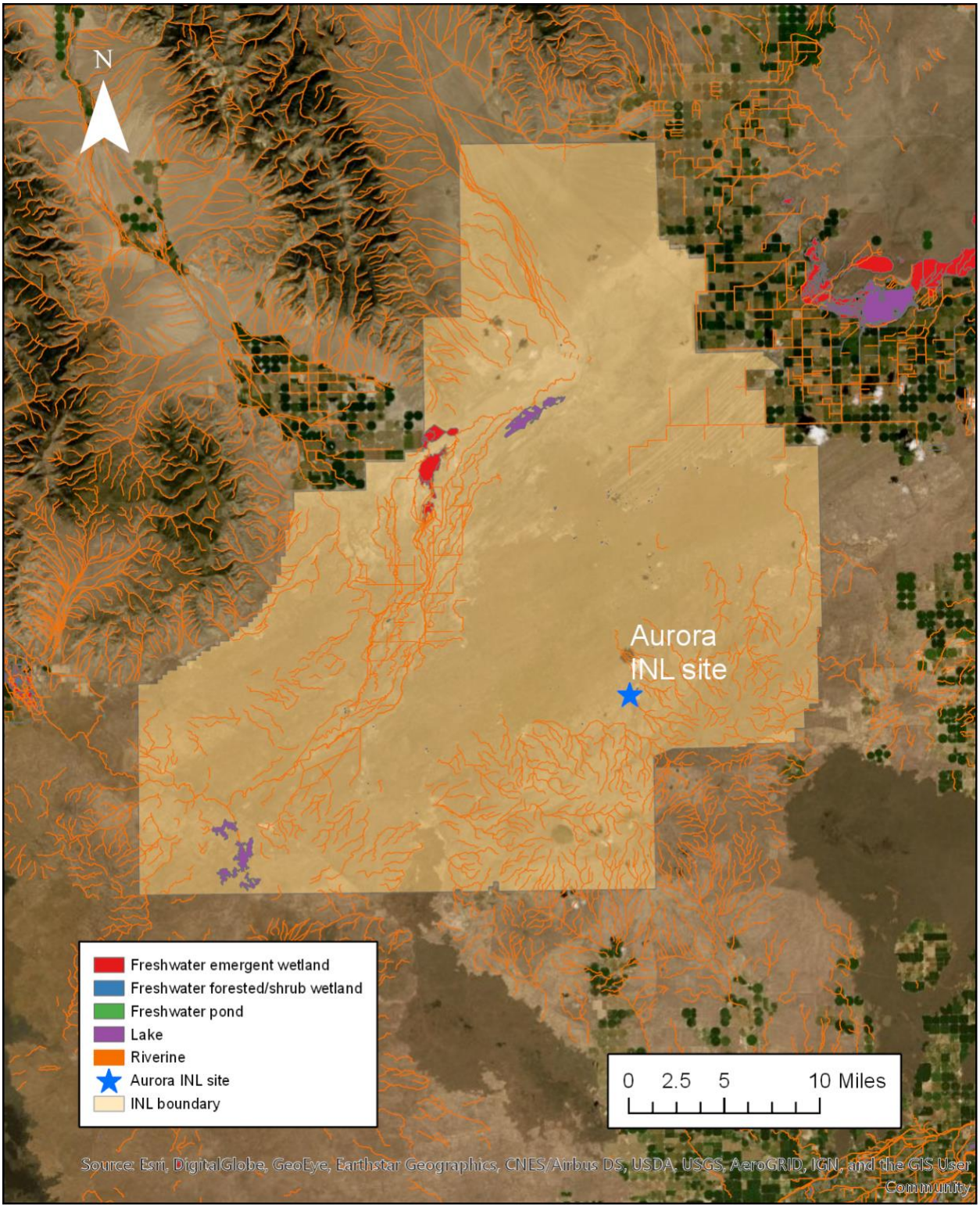


*Figure A-6: Wetlands within and near the Aurora INL site [16]*

  

## A.14 Summary

The purpose of this appendix is to show site-independent considerations of certain relevant environmental issues, to present commitments which may be necessary to evaluate on a site-specific basis, and finally, to evaluate the Aurora INL site against the environmental commitment set to determine if any additional information needs to be included in the Environmental Report.

The environmental commitments met by the Aurora INL site are not further discussed. For the candidate sites, all commitments are met, and no further information is necessary to be provided in the Environmental Report. Table A-1 provides a summary of the candidate sites environmental commitment evaluation.

*Table A-1: Candidate sites environmental commitment set checklist*

| Site characteristic | Value | Candidate sites |
|---|---|---|
| **Co-located units commitment** | | |
| Site is not a site with currently operating reactor | Y/N | Y |
| **Critical habitat commitment** | | |
| Site not located on critical habitat | Y/N | Y |
| **Floodplains commitment** | | |
| Site not located in 100-year floodplain | Y/N | Y |
| **Offsite construction aquatic ecosystem commitment** | | |
| Offsite construction does not impact waterbody | Y/N | Y |
| **Prime or unique farmlands commitment** | | |
| Site not on prime or unique farmlands | Y/N | Y |
| **Surface or near surface water commitment** | | |
| Distance from lowest floor level to groundwater greater than 5 feet | Y/N | Y |
| **Wetlands commitment** | | |
| No wetland onsite | Y/N | Y |

  