

U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

PUBLIC OUTREACH AND ENVIRONMENTAL SCOPING MEETING FOR THE KAIROS HERMES NUCLEAR TEST FACILITY CONSTRUCTION PERMIT APPLICATION

Wednesday, March 23, 2022

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Safety Project Managers

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Purposes of this Meeting

- Provide an overview of the NRC's Mission
- Describe the NRC review process
- Discuss scoping process under NEPA and NRC's regulations
- Describe how you can provide comments during the scoping period
- **Answer your questions, and listen to and gather your comments**

Nuclear Regulatory Commission

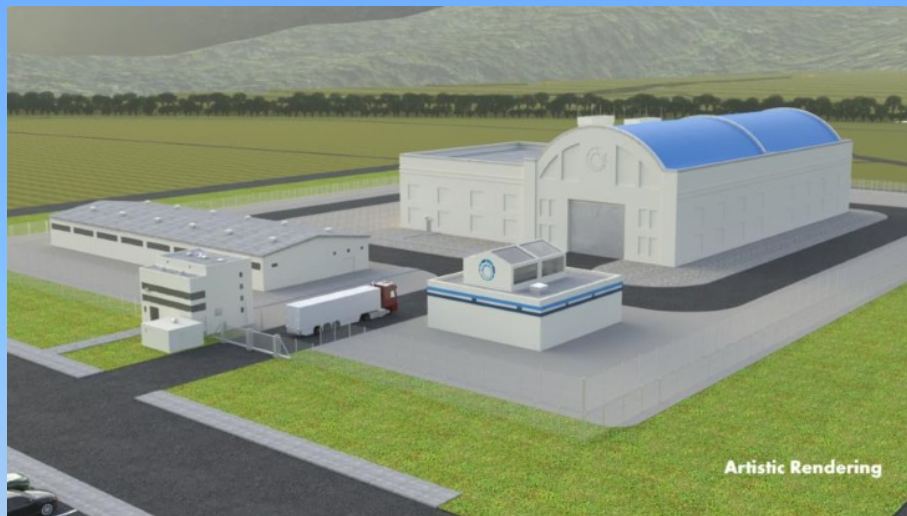
U.S. Nuclear Regulatory Commission

- Independent Federal Agency
 - Up to Five Commissioners
 - Professional Staff
- Over 40 years of experience regulating all civilian use of nuclear materials, including power and non-power reactors
- Mission: To protect public health and safety, promote common defense and security, and protect the environment

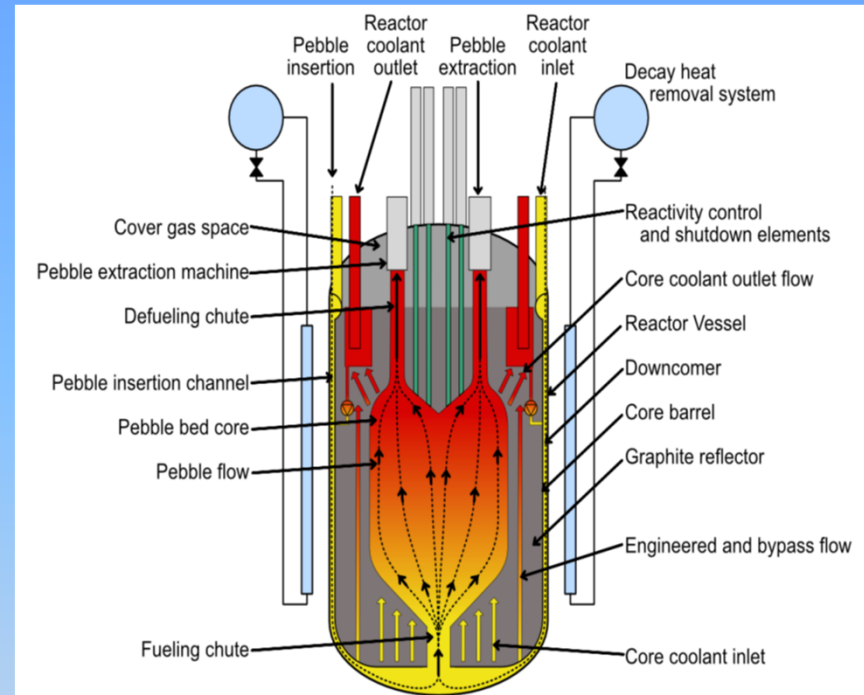
What the NRC Does

- Determines whether it is safe to build and operate a proposed nuclear reactor at a site
- Evaluates the environmental impacts of building and operating a nuclear reactor at the proposed site
- Inspects construction and safe operation of nuclear reactors
- Licenses reactor control room operators

The Kairos Hermes Facility



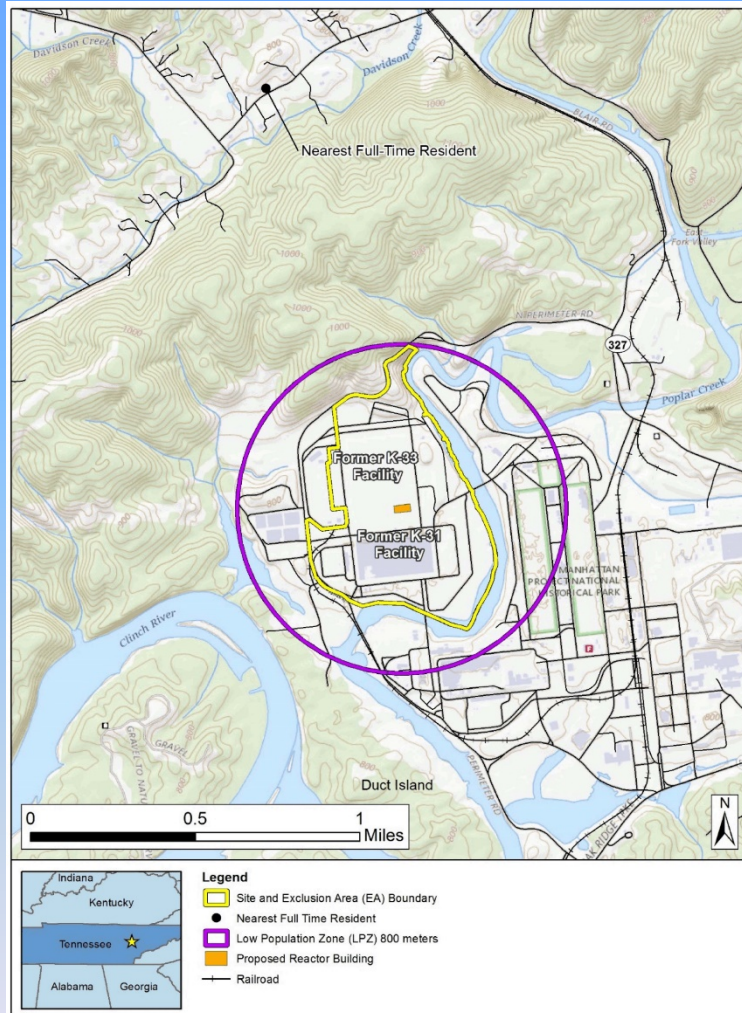
(Source: Kairos Power)



(Source: Kairos Public Meeting Presentation, January 2021)

- Non-power test reactor (35 megawatts-thermal) to demonstrate key technologies of Kairos Power Fluoride Salt-Cooled, High Temperature Reactor for future commercial deployment
- Reactor fuel: tri-structural isotropic (TRISO) pebbles containing high assay low-enriched uranium (HALEU)
- Reactor coolant: molten lithium fluoride and beryllium fluoride (Flibe) salt
- Reactor moderator and reflector: graphite
- Reactor is compact in size (~10 ft diameter, ~16 ft height)
- Low pressure, large thermal inertia, slow transient response, TRISO and Flibe retention of radionuclides, and other features to ensure safety

Proposed Hermes Site



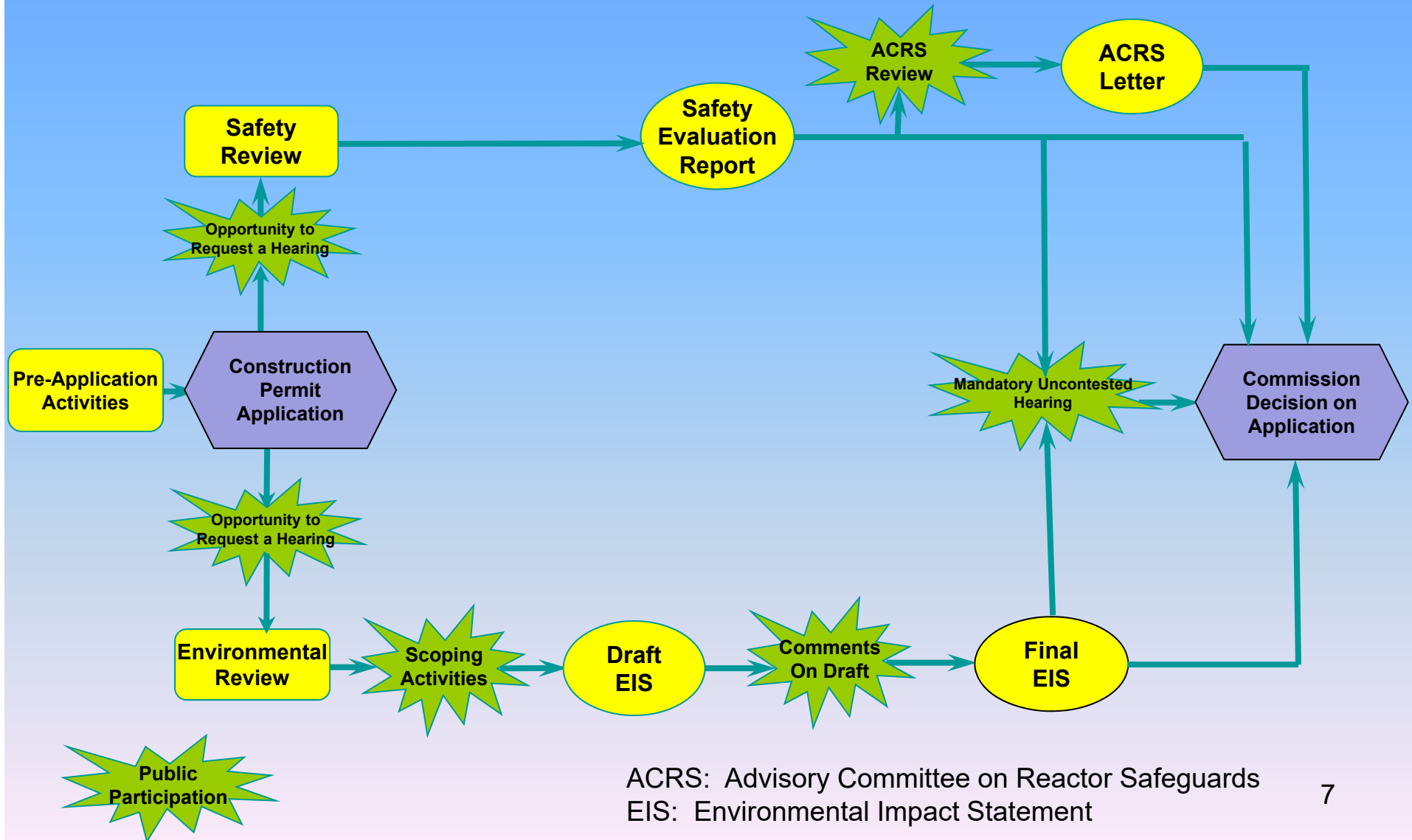
(Source: Hermes PSAR Ch 2)



(Source: Hermes PSAR Ch 2)

- 185-acre site in East Tennessee Technology Park (ETTP) in City of Oak Ridge
- Utilize lands formerly occupied by Oak Ridge Gaseous Diffusion Plant (ORGDP) Buildings K-33 and K-31

Test Reactor Construction Permit – NRC Review Process



NRC Safety Review Process

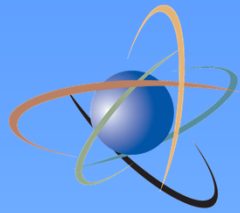
- The NRC staff performs test and research reactor (i.e., non-power reactor) safety reviews in accordance with guidance in NUREG-1537, “Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors.”
- Areas of review for a Construction Permit Application include (partial list):
 - Facility site characteristics
 - Preliminary facility design
 - Preliminary analyses of facility operation and possible accidents
 - Quality assurance
 - Emergency preparedness
- Kairos submitted its Hermes Construction Permit Application in September and October 2021 (2 parts); NRC accepted the application for review and began its detailed review of the application in November 2021.
- To clearly document its safety findings, and support an open and transparent process, the NRC staff safety review is summarized in a Safety Evaluation Report.
- The NRC staff currently expects to complete its Safety Evaluation Report in September 2023.

Construction Permit Hearing

- A mandatory uncontested hearing on the construction permit application will be held at a time and place to be set in the future
 - Staff will present and support its conclusions before either the Commission or the Atomic Safety and Licensing Board (ASLB)
- Interested persons may file a petition for leave to intervene (i.e., contested hearing) with respect to the application
 - The petition period is currently open and will close on April 11

Construction Permit

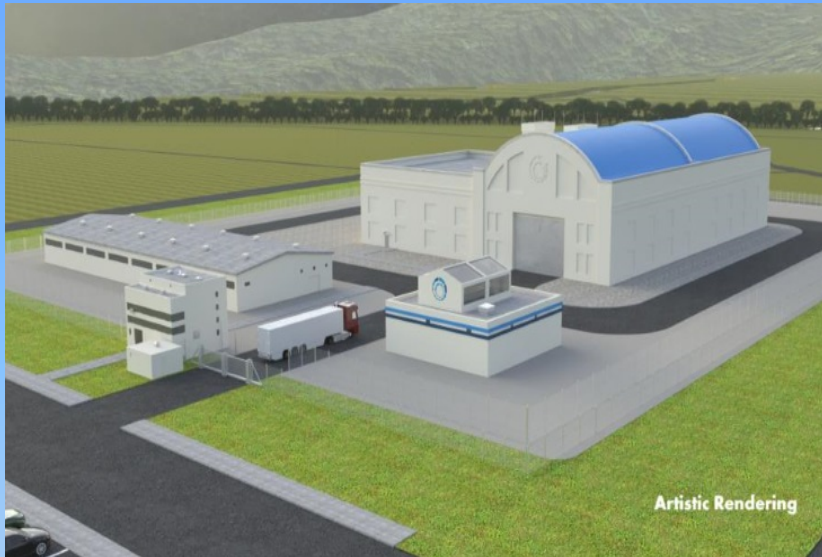
- An NRC document that authorizes an applicant to proceed with construction of a nuclear facility
- An additional application and NRC review of a final design is needed for an Operating License that approves operation of the facility



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ENVIRONMENTAL REVIEW PROCESS AND ENVIRONMENTAL SCOPING

Kairos Hermes Reactor

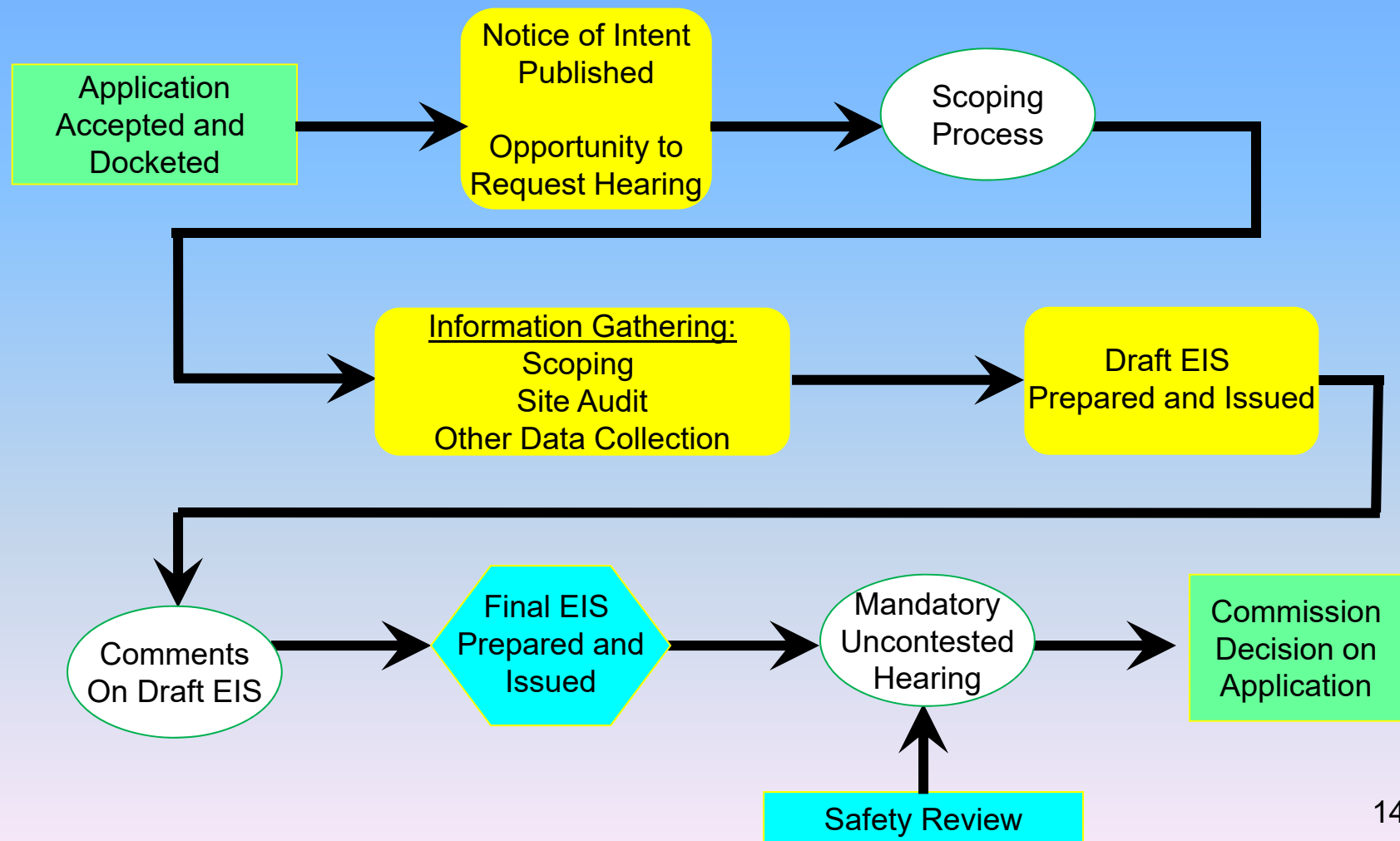


- Non-power test reactor - Demonstrate new technology
- 185-acre site in East Tennessee Technology Park (ETTP)
- Previous site of DOE Buildings K-33 and K-31
- Municipal/commercial water supply and treatment
- No surface or ground water use or discharge
- No cooling towers or transmission lines

Environmental Review

- Evaluate environmental impacts of construction and operation of a proposed nuclear facility per National Environmental Policy Act (NEPA)
- Test reactor requires the preparation of an Environmental Impact Statement (EIS)
- NRC systematic approach:
 - Regulations (10 CFR Part 51)
- Public Comments

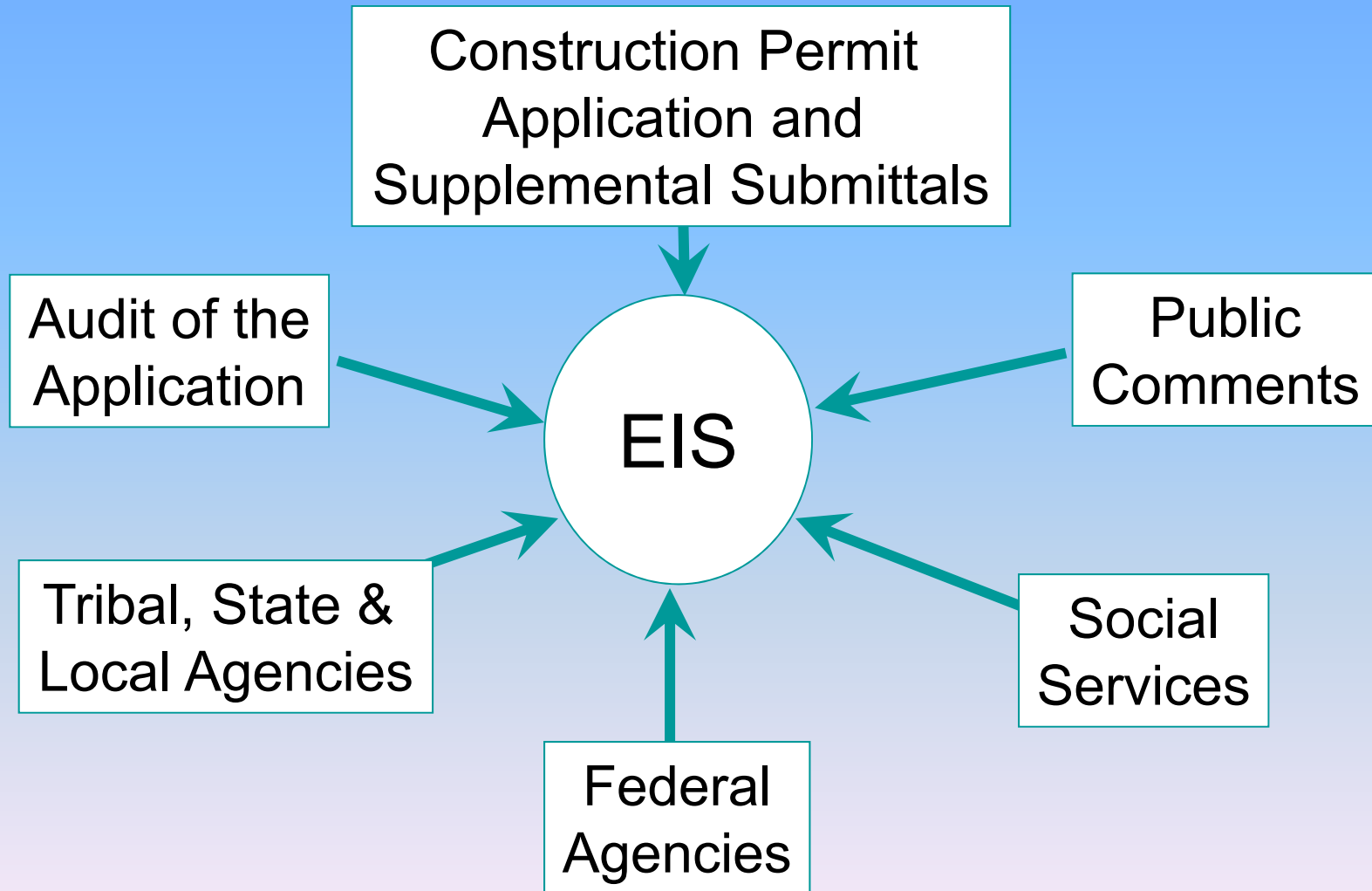
Environmental Review Process



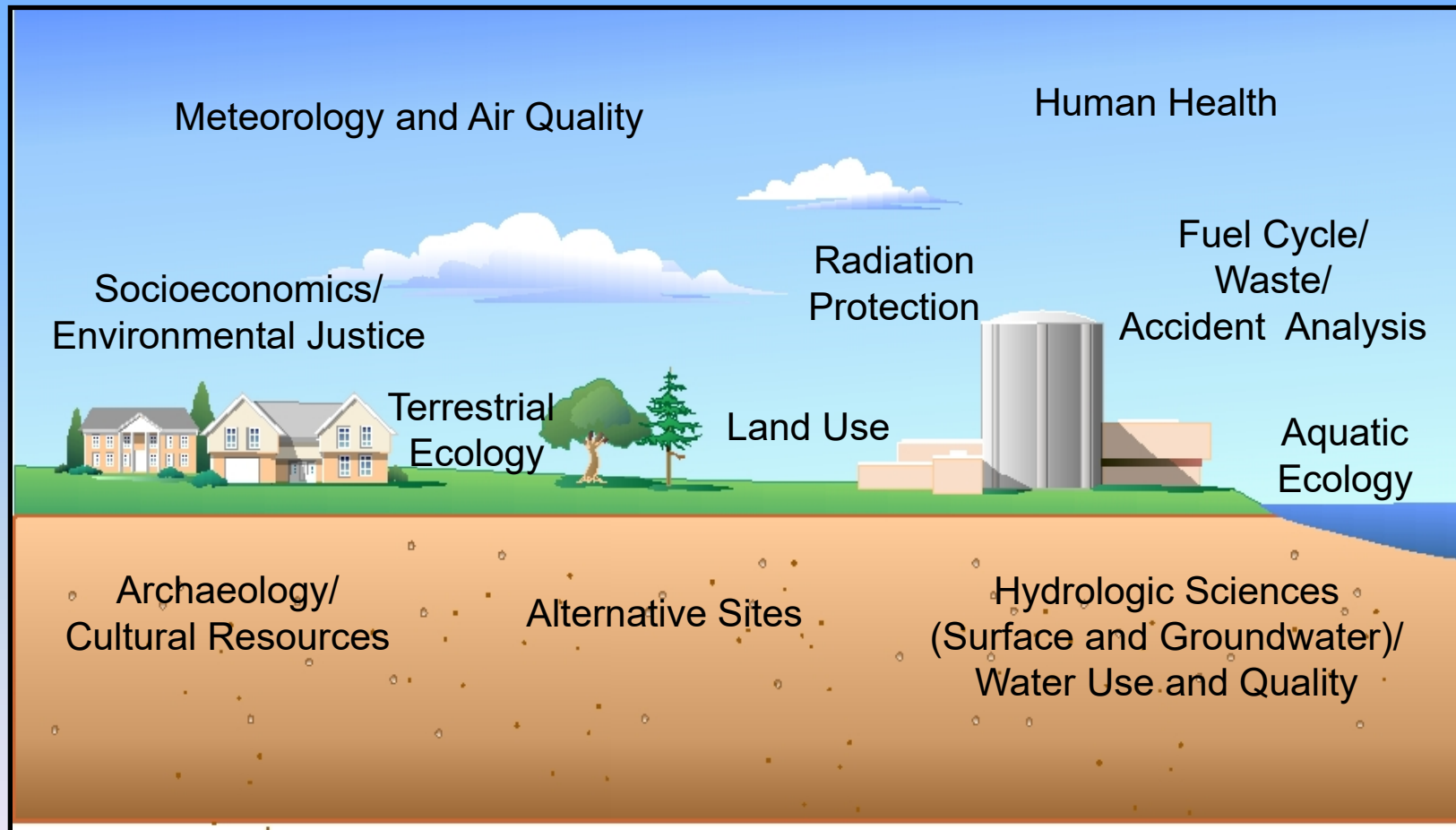
Environmental Scoping

- The scoping process helps determine the significant issues to be analyzed in the environmental impact statement
- The scoping period ends on **April 19, 2022**
- Comments that apply to the environmental review will be considered in development of the Draft EIS
- A Scoping Summary Report will be issued following the close of the scoping period

Information Gathering

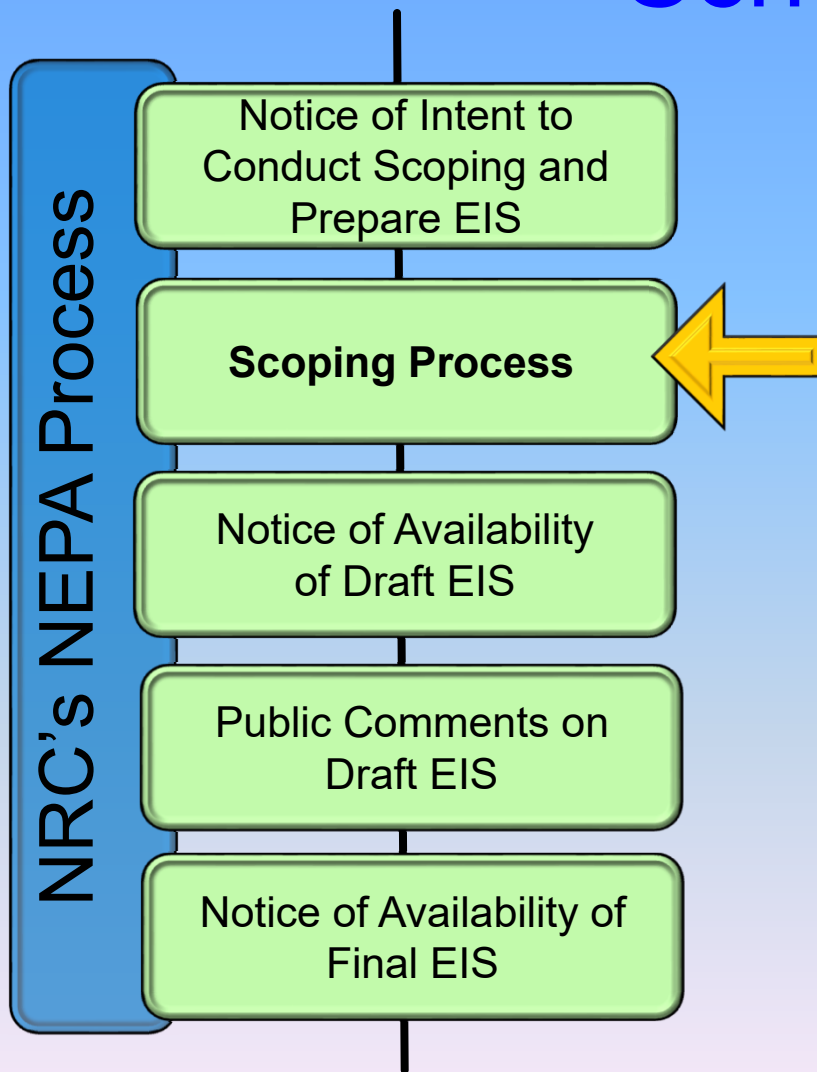


Resource Areas



Source U.S. NRC

Anticipated Environmental Review Schedule

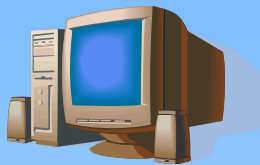


- Published *Federal Register* notice February 18, 2022
- **Scoping period from February 18 to April 19, 2022; virtual meeting today**
- Expect to publish draft EIS in November 2022
- There will be a 45-day comment period on the Draft EIS
- Final EIS expected to be published in September 2023

Contested Hearing

- Petition to Intervene requests to be filed no later than **April 11, 2022**
- Digital certificate or waiver required for filing a petition
- Instructions for e-filing are in the *Federal Register* hearing notice (87 FR 7503) or at www.nrc.gov/site-help/e-submittals.html
- Allow **10** business days for obtaining the digital certificate

Access to the Kairos Hermes Documents



<https://www.nrc.gov/reactors/non-power/hermes-kairos.html>



Oak Ridge Public Library
1401 Oak Ridge Turnpike
Oak Ridge, TN 37830

Additional Information

NRC's Kairos Hermes Project Web Site

<https://www.nrc.gov/reactors/non-power/hermes-kairos.html>

NRC Staff Points of Contacts:

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Submitting Scoping Comments



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ATTN: Program Management, Announcements
and Editing Staff

When submitting a comment, please provide your name and e-mail address so that we may provide a copy of the draft and final EIS

Comments are due by **April 19, 2022**