



**Pacific
Northwest**
NATIONAL LABORATORY

Environmental Justice and Nuclear Power

January 2021

Dave Anderson

Environmental Justice, Subject Matter Expert
Energy and Environment Directorate
Pacific Northwest National Laboratory

U.S. DEPARTMENT OF
ENERGY **BATTELLE**

PNNL is operated by Battelle for the U.S. Department of Energy

PNNL-SA-159030



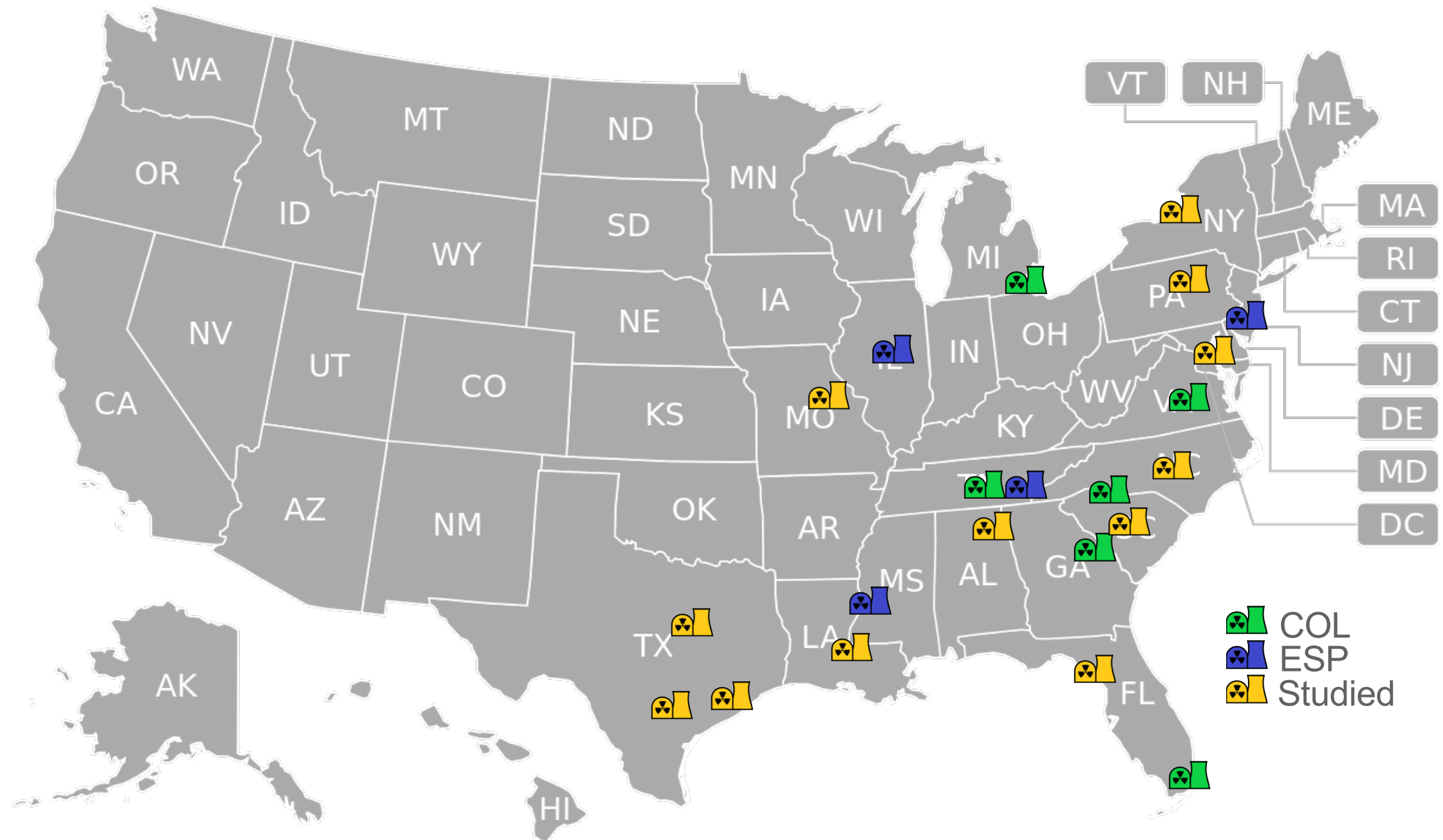
Agenda

- What is Environmental Justice (EJ)
- U.S. Nuclear Regulatory Commission (NRC) National Environmental Policy Act (NEPA) Review Experience
- EJ Assessment Process
- NRC EJ Populations Screening Analyses
- NRC Low-level Radioactive Waste (LLW) NEPA Review EJ Outcomes
- EJ Impacts Case Study

Executive Order 12898 (Clinton 1994)

“To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Marianas Islands.”

NRC Early Site Permit and Combined License NEPA Reviews



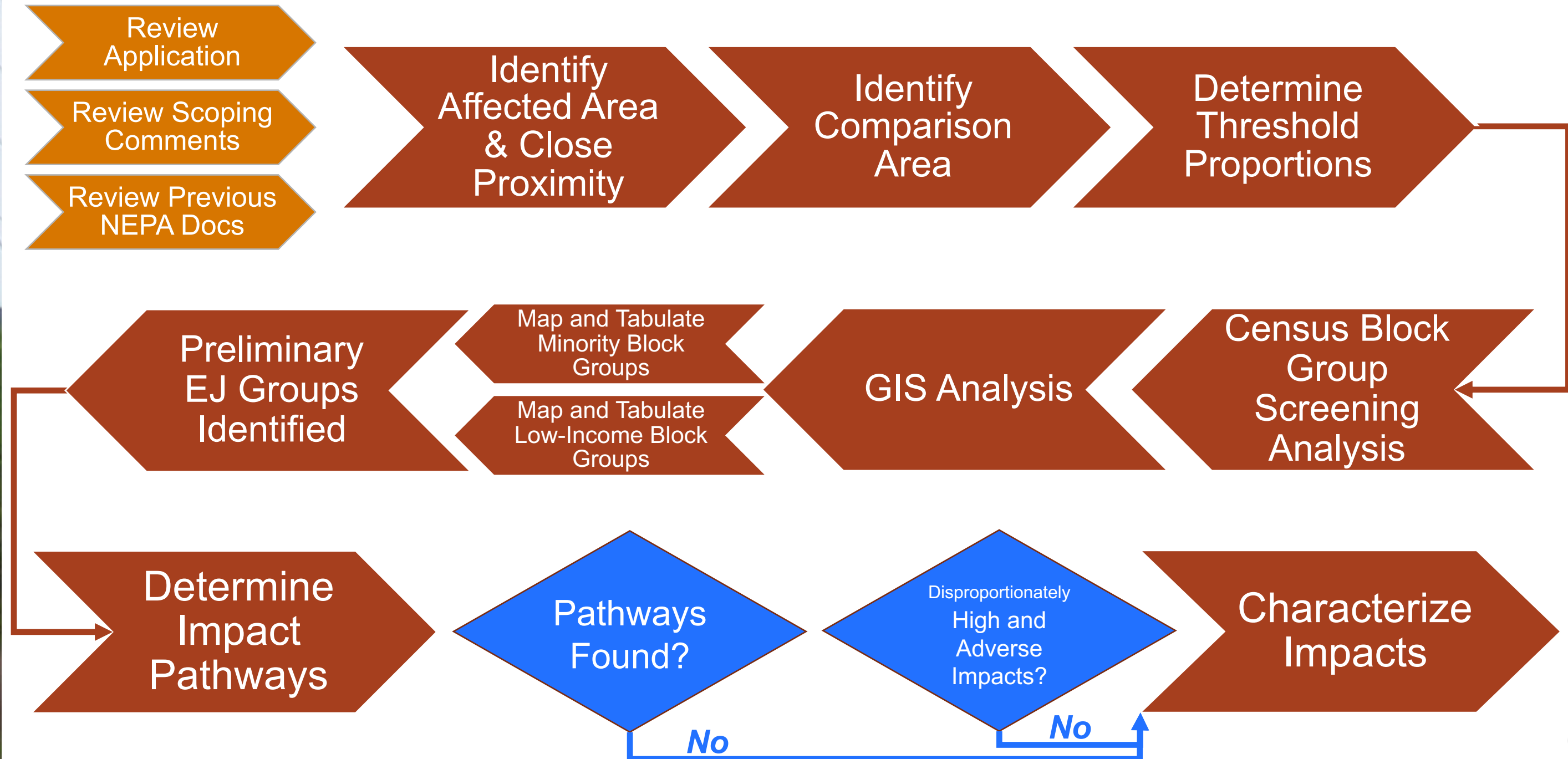
Typical NEPA Resource Areas for Nuclear Siting

Health Impacts
Radiological Health
Nonradiological Health
Air Quality
Noise
Occupational Health
Rad Transportation
Accidents
Waste Management

Environmental Impacts
Aquatic Ecology
Terrestrial Ecology
Surface Water Hydrology
Groundwater Hydrology
Land Use
Visual Aesthetics
Historic and Cultural Resources
Socioeconomics
Environmental Justice

Socioeconomic Impacts
Tax Revenue
Traffic / Trans. Infrastructure
Community Infrastructure
Housing
Education
Economics and Employment
Demographics/Migration

Simplified NRC EJ Impact Analysis Process



Drilling into EJ Assessment Approach

Determine Threshold Proportions

A population is identified as minority in an area affected by the action if “either

(a) the minority population of the affected area exceeds 50 percent, or

(b) the minority population percentage of the affected area is ***meaningfully greater*** than the minority population percentage in the general population or other appropriate unit of geographic analysis” – CEQ 1997

The same approach applies for low-income populations—individuals living at or below the federal poverty level.

Drilling into EJ Assessment Approach

Determine Impact Pathways

- Consult with other resource areas on the impacts they are finding—is there linkage to EJ populations?
- Desktop surveys—research the local area using tools like Google Earth, academic research, and stakeholder data sources
- Dashboard surveys—drive the wider area as part of the usual site visit, attempt to ground the truth in desktop findings
- Interview stakeholders—meet personally with local officials and organizations serving underserved populations
- Document observations for the record

Drilling into EJ Assessment Approach



Characterize Health Impacts

- Are the radiological or other health effects significant or above generally accepted norms?
 - For example, are particular races more susceptible to effects of specific health effects than the general public?
- Is the risk or rate of hazard significant and appreciably in excess of the general population?
 - For example, if EJ groups are located in close proximity, does this increase their risk compared to the general public?
- Do the radiological or other health effects occur in groups affected by cumulative or multiple adverse exposures from environmental hazards?
 - For example, are the same EJ groups also located near other facilities with nuclear material?

Drilling into EJ Assessment Approach

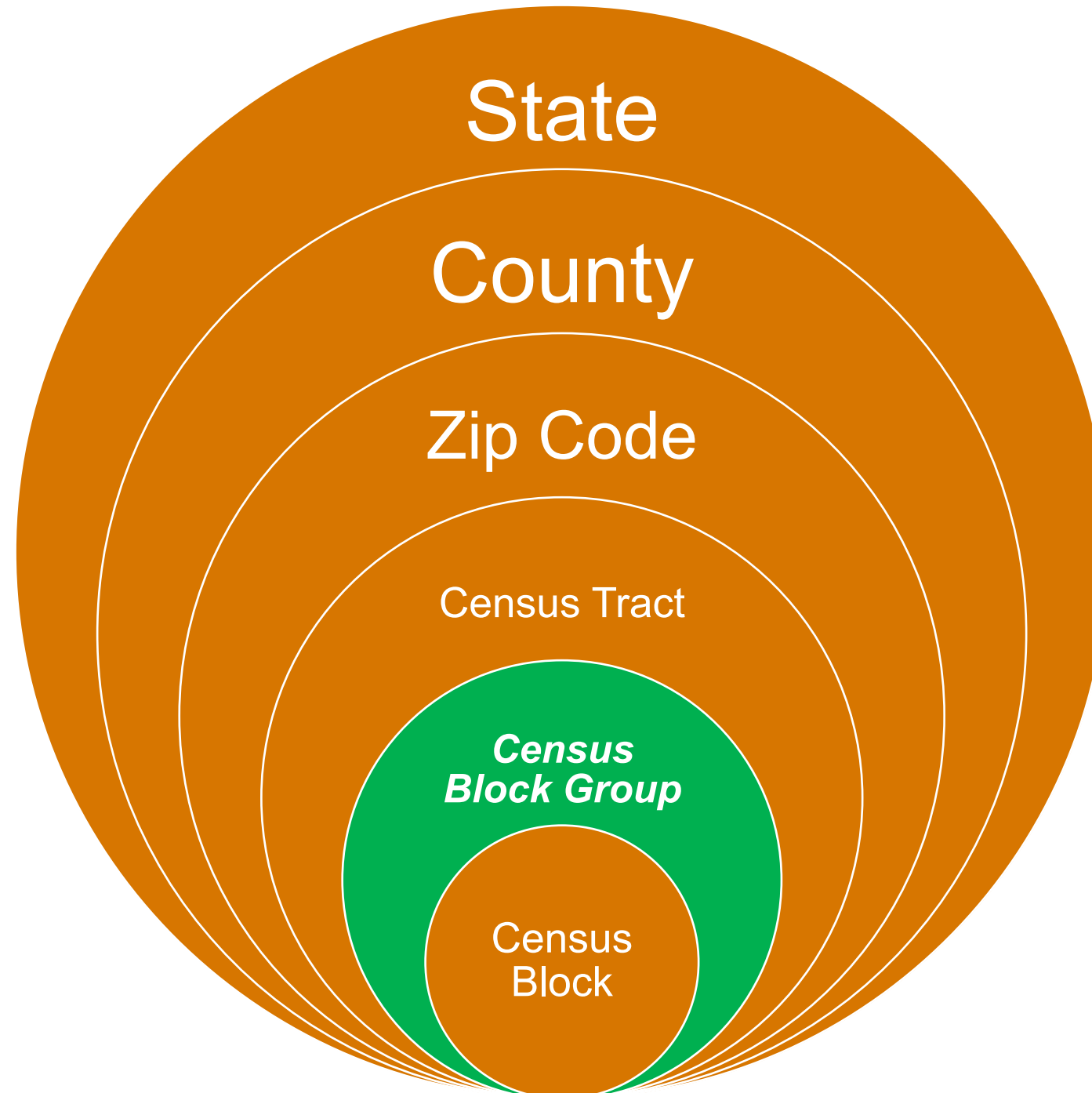
Characterize Environmental Impacts

- Is there an impact on the natural or physical environment that noticeably and adversely affects a particular group?
 - For example, would local construction noise, traffic, and dust impacts be more noticeable in close proximity to the proposed action site and are EJ groups present there?
- Are there noticeable adverse impacts on a group that are likely to appreciably exceed those of the general population?
 - For example, are chemical effluents more harmful to a particular race or would any expected increases in concentrations in local fish and wildlife disproportionately affect EJ groups consuming local food resources?
- Do the environmental effects occur in groups affected by cumulative or multiple adverse exposure from environmental hazards?
 - For example, are the same EJ groups also located near other mining or industrial facilities with locally adverse impacts?




Example Wording of Impact Conclusions

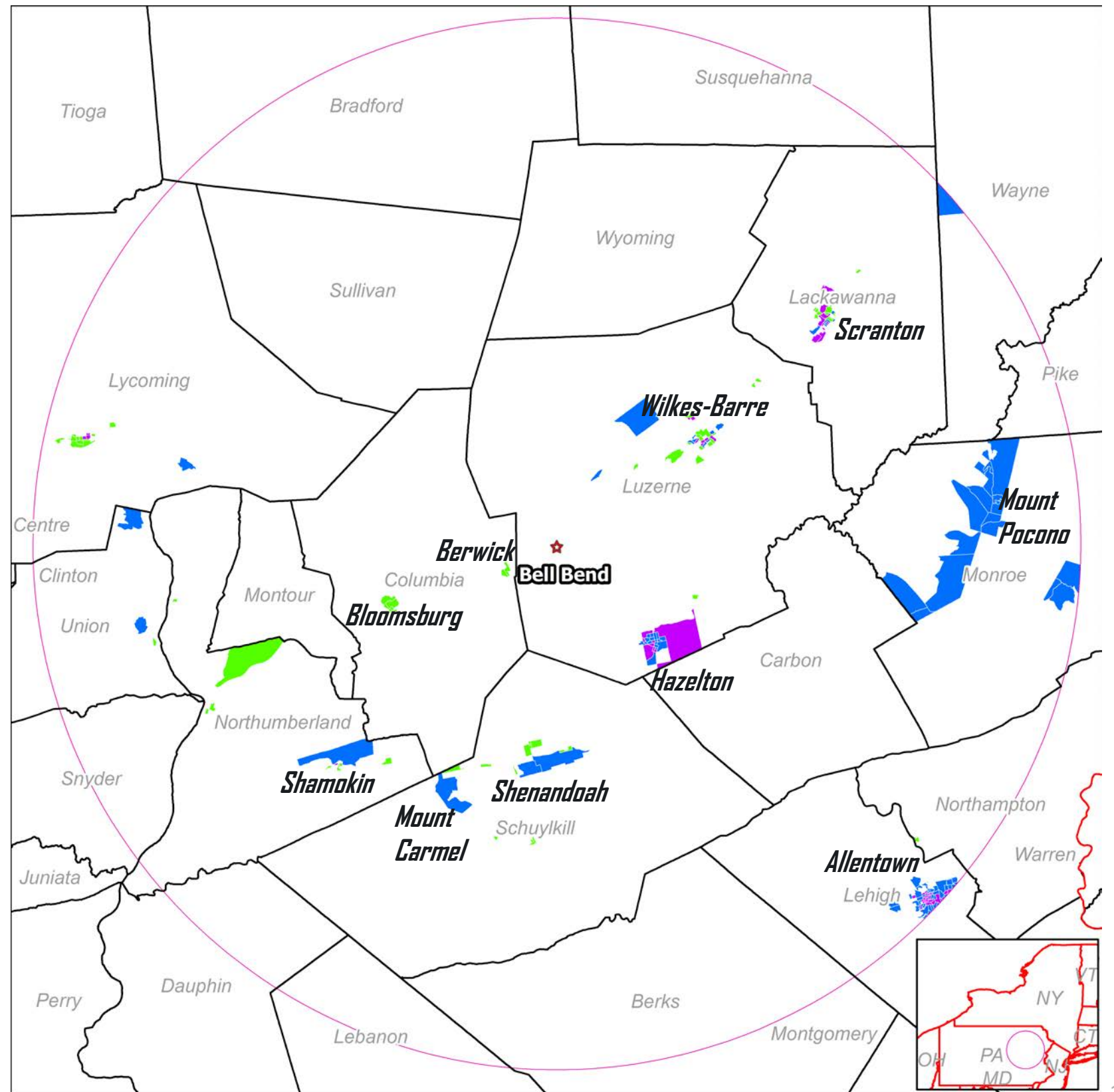
- The NRC did not identify any minority or low-income populations near the proposed action site in concentrations that are meaningfully greater than the concentration found in the comparison area (e.g., state) population. Thus, disproportionately high and adverse human health, environmental, physical, or socioeconomic effects on these groups would not be expected as a result of the proposed action.
- The NRC did not identify any potential environmental pathways by which the identified minority or low-income populations in the affected area would likely experience disproportionately high and adverse human health, environmental, physical, or socioeconomic effects as a result of the proposed action.
- The NRC determined that potential environmental pathways including (list...) exist by which the identified minority or low-income populations in the affected area would likely experience disproportionately high and adverse human health, environmental, physical, or socioeconomic effects (describe the specific impact) as a result of the proposed action.

Census Data Geographic Resolution






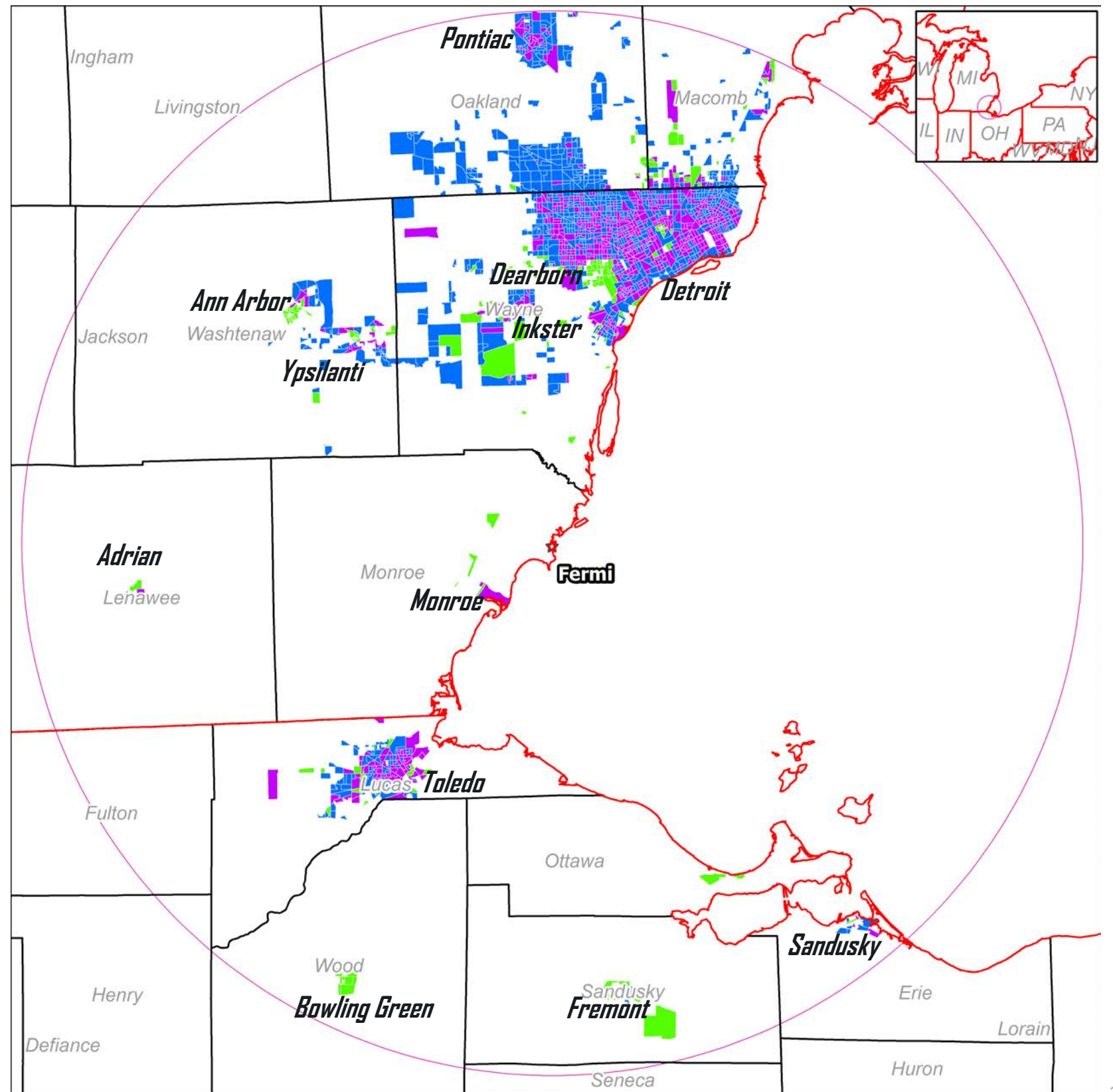
Bell Bend EJ Block Groups (50 mi radius)

-  **Low-Income**
-  **Minority**
-  **Low-Income & Minority**






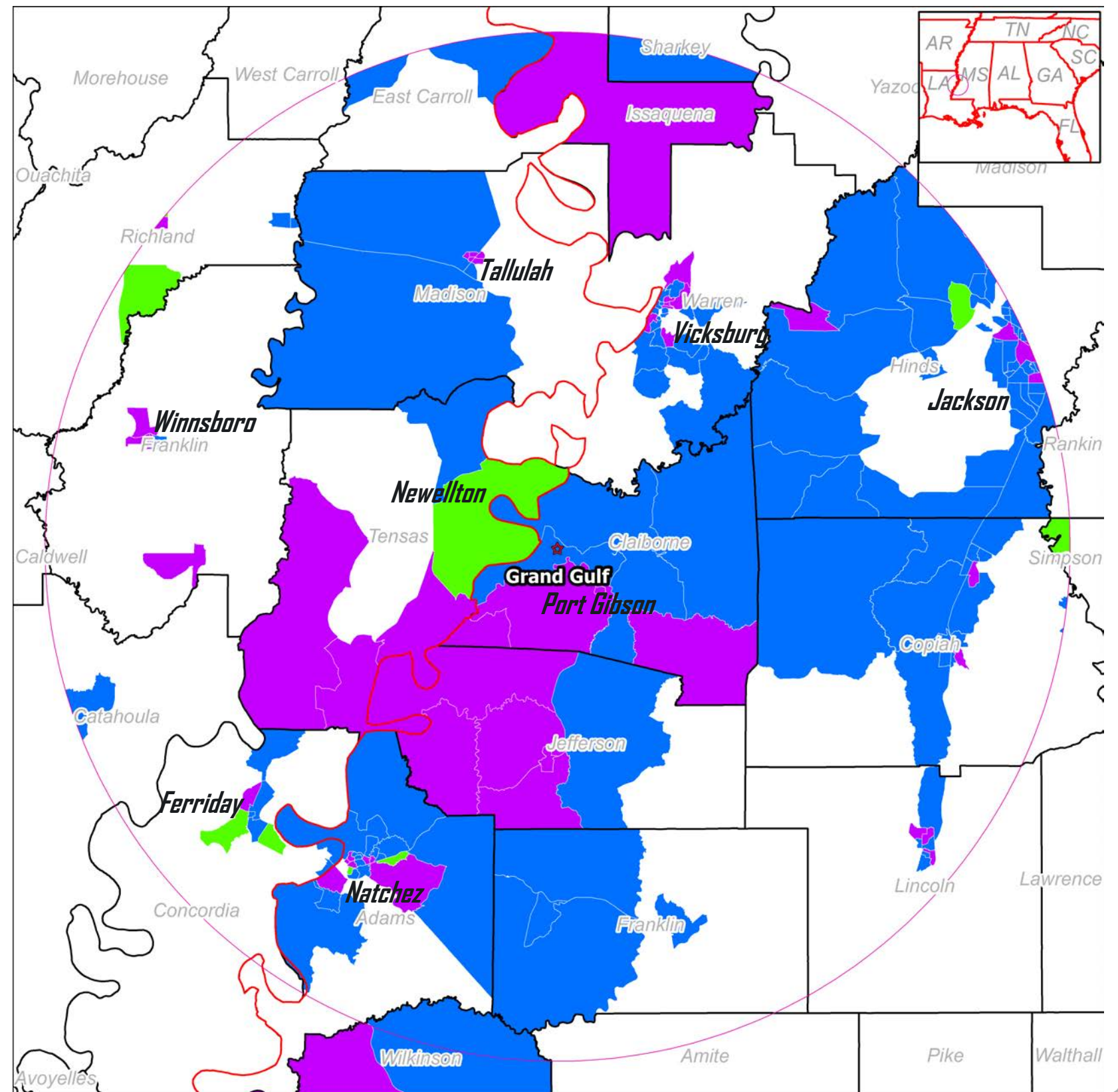
Fermi EJ Block Groups (50 mi radius)

-  **Low-Income**
-  **Minority**
-  **Low-Income & Minority**






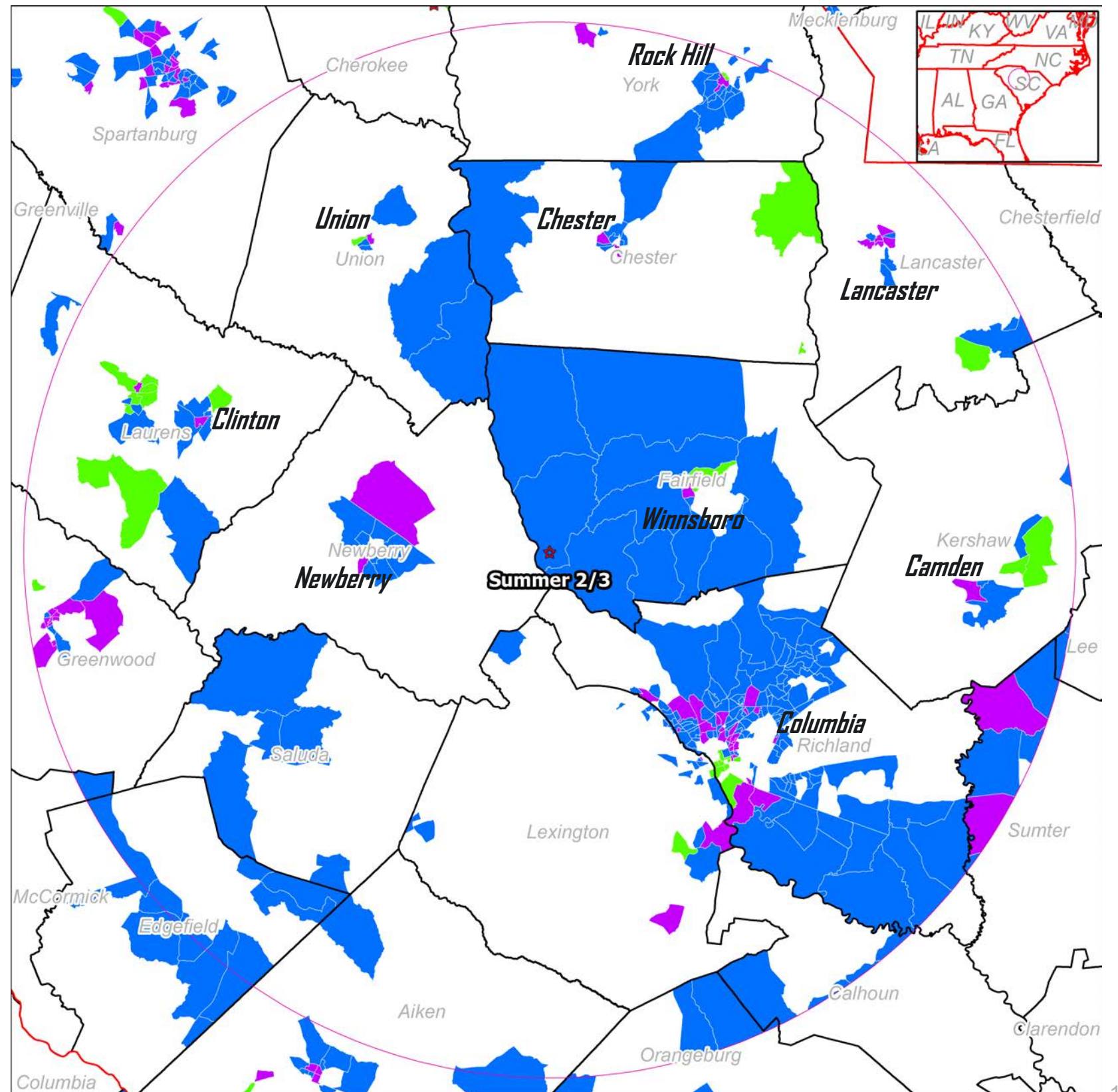
Grand Gulf EJ Block Groups (50 mi radius)

-  **Low-Income**
-  **Minority**
-  **Low-Income & Minority**



V.C. Summer EJ Block Groups (50 mi radius)

-  **Low-Income**
-  **Minority**
-  **Low-Income & Minority**



EJ Impact Findings by Plant Site NEPA Review

Site	State	License	EJ Populations	EJ Impact	Impact Pathway
Bell Bend	PA	COL*	No	No	
Bellefonte	AL	COL*	Yes	NA	Review suspended
Callaway	MO	COL*	No	NA	Review suspended
Calvert Cliffs	MD	COL*	No	No	
Clinch River	TN	ESP	No	No	
Clinton	IL	ESP	No	No	
Comanche Peak	TX	COL ⁺	Yes	No	
Fermi	MI	COL	Yes	No	
Grand Gulf	MS	ESP; COL*	Yes	Yes	Community Infrastructure; Tax Revenue
Harris	NC	COL ⁺	Yes	NA	Review suspended
Lee	SC	COL	Yes	No	
Levy County	FL	COL ^t	No	No	
Nine Mile Point	NY	COL*	No	NA	Review suspended
North Anna	VA	COL	No	No	
River Bend	LA	COL*	Yes	NA	Review suspended
Salem-Hope Creek	NJ	ESP	No	No	
South Texas	TX	COL ^t	Yes	No	
Summer	SC	COL^t	Yes	Yes	Traffic
Turkey Point	FL	COL	Yes	No	
Victoria	TX	COL*	Yes	NA	Review suspended
Vogtle	GA	COL	Yes	No	
Watts Bar	TN	OL	No	No	

t - License terminated by licensee

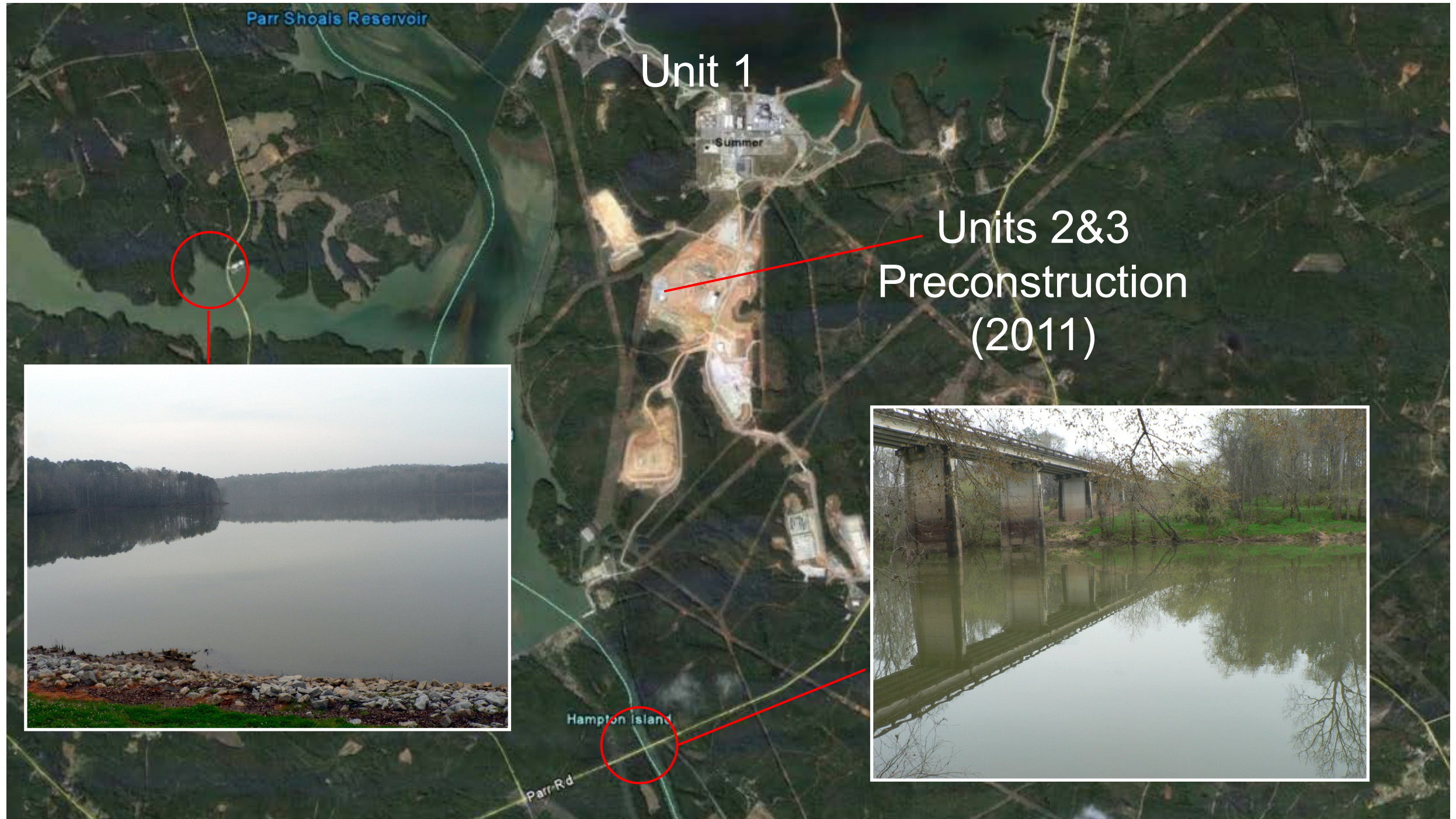
+ - Application suspended

* - Application withdrawn

Local Reconnaissance of V.C. Summer Nuclear Station Unit 2 Project Revealed:

- 90%+ African American residents
- Low-income not revealed by Census, and high unemployment
- Subsistence and cultural fishing
- Reliance on backyard gardens
- These practices are fading with aging population
- Significant foot travel, lack of scheduled transportation

Locations for Subsistence and Cultural Fishing Found Near V.C. Summer



Scoping Customized to Community

- Staff interviewing of stakeholders
- Additional scoping meeting in Jenkinsville, SC
- Less formal, open house format used to receive public comments
- Local residents conducted a survey and the responses were included on the record as comments

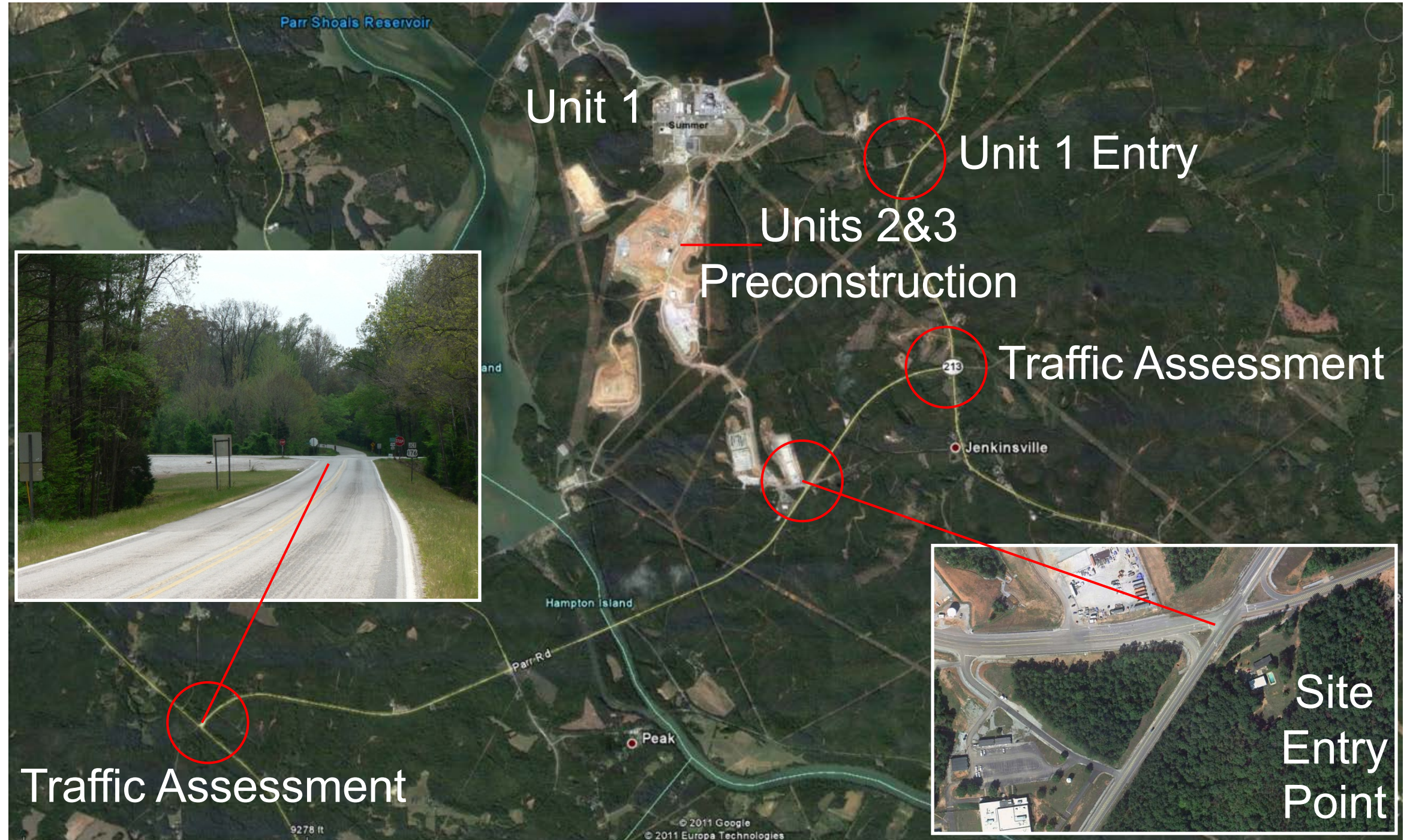
Open House for Community near V.C. Summer



EJ Outreach Findings for V.C. Summer

- Staff determined MODERATE traffic impacts would occur at the peak of site employment
- Impacts are “disproportionate and adverse”
 - Local community would experience most of the traffic impacts
 - Local community is an Environmental Justice population
- Environmental Justice impact found

MODERATE Transportation Impacts Determined



Mitigative Factors

- Transportation impacts will be mitigated by Applicant
- Local job training center in Dawkins
- Partnership between construction contractors and local community colleges for training certifications
- Active recruitment of new industry to Fairfield County

Summary of V.C. Summer EJ Assessment

- Environmental Justice thresholds tripped
- Scoping tailored to local community needs
- MODERATE traffic impacts found
- Disproportionate and adverse impacts to the Environmental Justice population results
- Mitigation prevents a LARGE impact to the community

Environmental Justice Capabilities at PNNL

- Demographic Analysis
- Environmental Assessment
- Coordination with Cultural Resources
- “Boots on the ground” field observations, dashboard surveys
- Stakeholder Engagement
 - Develop a plan
 - Define stakeholders
 - Tailored communication and messaging
 - Customer service



**Pacific
Northwest**
NATIONAL LABORATORY

Thank you!

To learn more, contact:

Dave Anderson

Environmental Justice, Subject Matter Expert

dma@pnnl.gov

509-375-6781

Tara O'Neil

Earth Systems Sciences, Technical Advisor

Nuclear Regulatory Sub-Sector, Manager

tara.oneil@pnnl.gov

509-371-6118

Energy & Environment Directorate

Pacific Northwest National Laboratory

pnnl.gov

