

Considerations for Communities Evaluating Proposed Data Centers

This preliminary, working document was prepared by a group of Extension educators and specialists at Oklahoma State University. It compiles several questions that have arisen from data center discussions among researchers and in communities. It is meant to serve as a reference to some of the things that may be considered when a data center is proposed but does not reflect a position by OSU on data centers. OSU Extension's working group on data centers is developing a factsheet series that will provide more information on what data centers are and water, energy, and economic considerations. Questions can be directed to water@okstate.edu.

Understanding the Proposal and What is Being Approved

- Is this proposal for a single building, or is it part of a larger campus or phased development?
- How many phases are planned?
- What specifically triggers approval of each future phase?
- What is the maximum total build-out allowed under current zoning or development agreements?
- Are future expansions subject to new public hearings, or can they proceed administratively?
- Are approvals tied to this specific operator, or can the facility be sold, leased, or transferred without public review?
- Can building density, computing density, or infrastructure capacity increase without reopening approvals?

Expansion Safeguards and Limits

- Can water use, electricity demand, or land use increase without additional community approval?
- Are there enforceable caps on:
 - Total water use?
 - Total electricity demand?
 - Total building square footage?
 - Number of backup generators?
- Do these caps apply per phase, or to the entire project lifespan?
- What automatic actions occur if a cap is exceeded?
- Are penalties automatic or discretionary?

Cumulative and Regional Impacts

- Has anyone evaluated the combined impact of this facility?
 - Other nearby data centers?
 - Existing industrial or high-demand users?
- Has future growth in the same watershed or electric grid region been considered?
- If water or energy demand doubles or triples over time, how and when will impact be reassessed?
- Who has authority to pause expansion if cumulative impacts exceed projections?

Water Use, Drought, and Long-Term Security

Baseline and Future Water Demand

- How much water will be used:
 - At opening?
 - At full-build out?
 - After potential expansion?
- If a closed-loop system is used, how frequently will new water be withdrawn?
- Is water use expected to increase over time as computing density increases?
- What is the expected water use effectiveness (WUE)?
- How will seasonal variability in water availability be managed?

Water Sources

- What specific water sources will be used?
 - Aquifer?
 - Reservoir?
 - River/stream?
 - Municipal system?

Drought Planning

- Is there a written drought management plan tied to permits or contracts?
- During drought conditions:
 - Can water deliveries be reduced or paused?
 - Who has priority—residents, critical institutions, or the data center?
- Will future expansions be automatically halted if water availability declines?
- How much water is reserved for fire suppression, and does it draw from the same source(s)?

Cooling Systems and Wastewater

- What cooling technology is proposed initially?
- Will there be some kind of chemical treatment, such as dielectric cooling?
 - If so, what specific chemicals will be used in that process?
- What source water quality parameters are required for cooling systems?
- Are there plans to use alternative water sources (reclaimed water, brackish water, rainwater, etc.)?
 - If so, what treatments would be required?
- Could future expansions switch to a more water-intensive cooling system?
- How much water will be:
 - Lost to evaporation?
 - Reused or recycled in a closed loop?
- Will heated or treated water be discharged?
- If discharged:
 - Where will the water go (stream, river, pond, groundwater, etc.)?
 - Could expanded operations increase discharge volume or temperature?
- How will cooling performance be maintained during extreme heat events?

- Will chemicals or treatment processes be used in cooling systems?
 - If so, what chemicals or processes will be used?
- Will aerosol drift occur from cooling systems?
 - If so, what chemicals will the aerosol contain?

Electrical Demand and Grid Reliability

Electrical Load

- How much electricity (MWh or GWh) will the data center use at opening?
 - What is the estimated power usage efficiency (PUE)?
- How does that compare to the current electricity use of the town or county?
- What is the expected load factor (average vs peak demand)?
- Will the facility operate continuously at near-constant load or fluctuate significantly?
- What is the maximum power demand allowed under current approvals?
- Can power demand increase without revisiting permits or rate structures?

Infrastructure and Reliability

- Will new substations, transmission lines, or power plants be required now or later?
- Who pays for that infrastructure—the company or local ratepayers?
- How will load growth affect grid reliability during:
 - Extreme heat?
 - Winter storms?
 - Peak demand events?
- What happens if the facility energy demand suddenly increases up or suddenly drops offline?
 - Is there a plan for an uninterruptible power supply (UPS)?
- During grid emergencies:
 - Does the facility have priority service?
 - Can its load be curtailed?

Backup Generation and Air Quality

- How many backup generators will be installed initially?
- Can additional generators be added later without public review?
- What fuels will generators use, and how often will they operate?
- What emissions controls or after-treatment technologies will be used?
- Are there any expected emissions from testing and emergency use?
- Are there any enforceable noise and air quality limits at the property boundaries?
- **Utility Rates and Cost Allocation** What is the expected operational lifespan of the data center?
- Is there an explicit decommissioning plan if the facility becomes obsolete?
- Who pays for demolition and site cleanup?
- Is there a bond or financial guarantee for decommissioning?

- Does that guarantee increase if the facility expands?
 - Can the land be restored or reused for other purposes?
 - Who bears responsibility for stranded infrastructure?
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- Will residential or small-business utility bills increase because of this project?
 - Are protections in place to prevent cost-shifting to local customers?
 - If the facility expands, who pays for:
 - Added grid capacity?
 - Water system upgrades?
 - Wastewater infrastructure?

Stormwater, Flooding, and Heat Impacts

- How many acres will become impervious at initial build-out?
- What storm return intervals were used in runoff modeling (e.g. 10-year, 100 year)?
- How many additional acres could be paved under full build-out?
- How will increased runoff affect nearby streams and drainage systems?
- Has stormwater modeling considered future expansion scenarios?
- Is the site located in a flood-prone area?
- Will the facility increase local temperatures or urban heat impacts?
- Will expansion amplify heat impacts on nearby neighborhoods or ecosystems?
- What modeling has been done on localized temperature changes from heat rejection?

Wildlife, Habitat, and Noise

- How much habitat will be lost initially and at full build-out?
- Will cooling systems or generators produce continuous noise?
- Could expansion increase noise levels or duration?
- Have impacts on birds, bats, aquatic species, and pollinators been studied?

Climate and Emissions

- What are the indirect greenhouse gas emissions from powering the facility?
 - What is the expected carbon use effectiveness (CUE)?
- Will expansion increase fossil-fuel generation locally or regionally?
- Are “clean energy” claims based on:
 - New generation?
 - Renewable energy credits from elsewhere?
- Will future expansion require new energy sources not currently planned?

Economic Benefits and Long-Term Costs

- How many community-based permanent jobs will exist:
 - At opening?
 - After expansion?
- What wages and benefits will those jobs provide?
- What tax incentives are being offered?

- Do incentives increase with expansion?
- Has a full cost-benefit analysis been completed?
 - Did that analysis include:
 - Water?
 - Energy?
 - Infrastructure?
 - Emergency services?
 - Property Value Impact?

Local Workforce and Labor Standards

- What is an estimated percentage of permanent jobs filled by local residents?
- Will fly-in/fly-out or rotational labor models be used?
- Will there be prevailing wage or wage floor commitments?
- Will there be limits on contractor substitution for permanent roles?
- Will subcontractors meet the same labor standards?
- Will there be provided workforce training or education investment?
- Will there be expected use of temporary work visas and duration?

Emergency Services, Safety, and Security

- How will the facility cooperate with Fire, EMS, and law enforcement?
- Will there be required training for lithium-ion batteries and high-voltage systems?
- If there are required emergency service upgrades, who will pay for those upgrades?
- Will there be public access at request to facility?

Decommissioning, Abandonment, and Liability

Transparency, Oversight, and Community Role

- Will water, energy, and emissions data be publicly reported?
 - i. If so, in what format will it be share (e.g. annual report, regulatory filings, etc.)?
- How often will monitoring data be updated?
- What happens if the company exceeds approved limits?
- Who enforces compliance?
- How can residents participate in oversight after approval?
- Who should residents contact if impacts worsen over time?

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