MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Air permitting for Data Centers in Michigan

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About Me

- Graduated with a BS in Mechanical Engineering from Western Michigan
- Graduated with MS in Mechanical Engineering from Western Michigan
- Started in the AQD in March 2021
- Currently work in the Thermal Process Unit of the Permit Section

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Overview

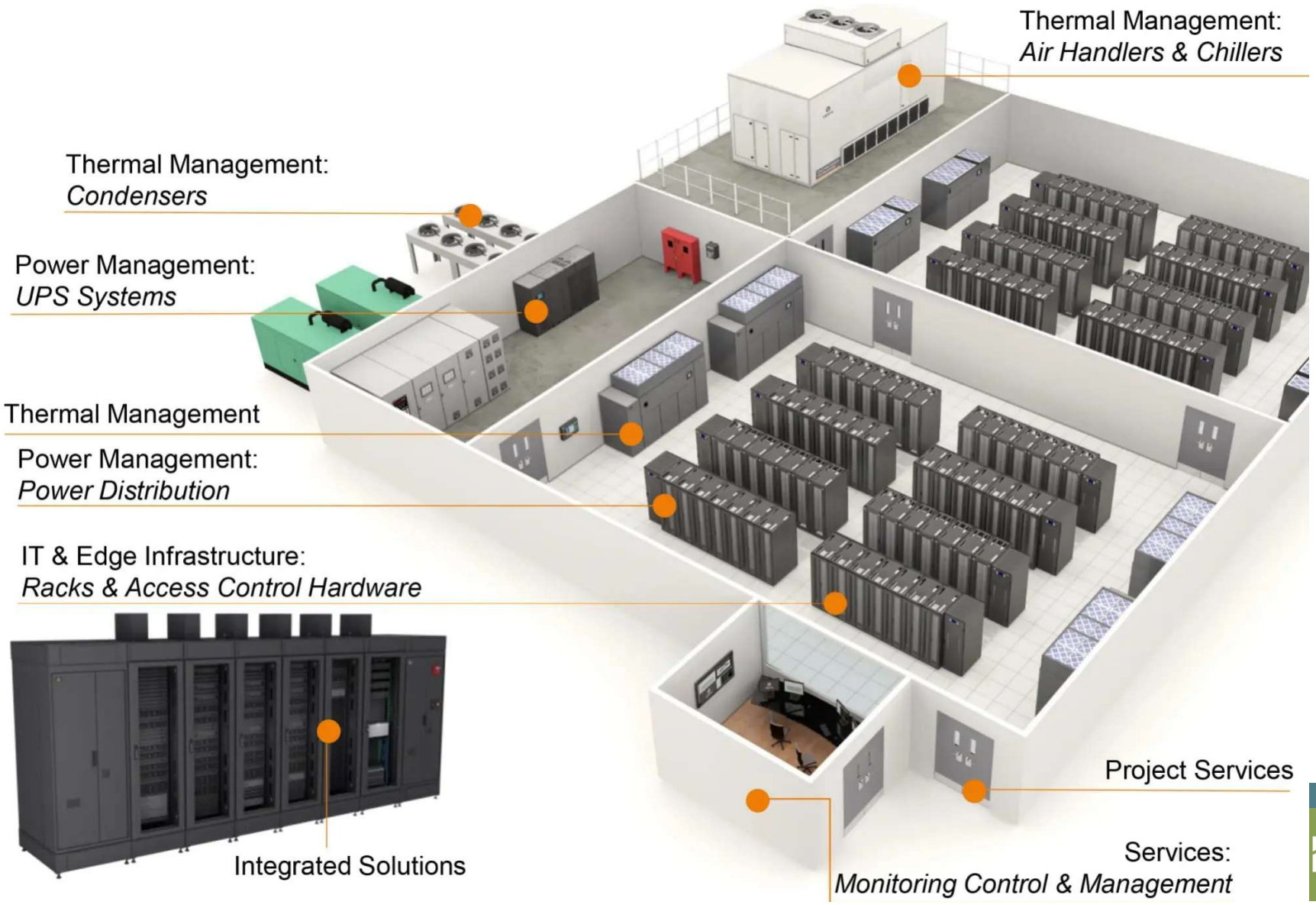
What is looked at in a PTI application when permitting a data center?

Key Terms

- Criteria pollutants:
  - NO_2, CO, PM10/PM2.5, lead, SO_2, and Ozone
- NAAQS: National Ambient Air Quality Standard
- Nonattainment: An area that does not meet the NAAQS
- TAC: Toxic Air Contaminant

Key Terms

- PSD: Prevention of Significant Deterioration
- PSD Increment: National standards put into place to protect public health
- NSPS: New Source Performance Standards
- NESHAP: National Emission Standards for Hazardous Air Pollutants


Thermal Management:
Air Handlers & Chillers
Thermal Management:
Condensers
Power Management:
UPS Systems
Thermal Management
Power Management:
Power Distribution
IT & Edge Infrastructure:
Racks & Access Control Hardware
Integrated Solutions
Project Services
Services:
Monitoring Control & Management

- Does Rule 285
  - For engines le
- Does Rule 278 35?
- Always talk to t potentially using an exemption

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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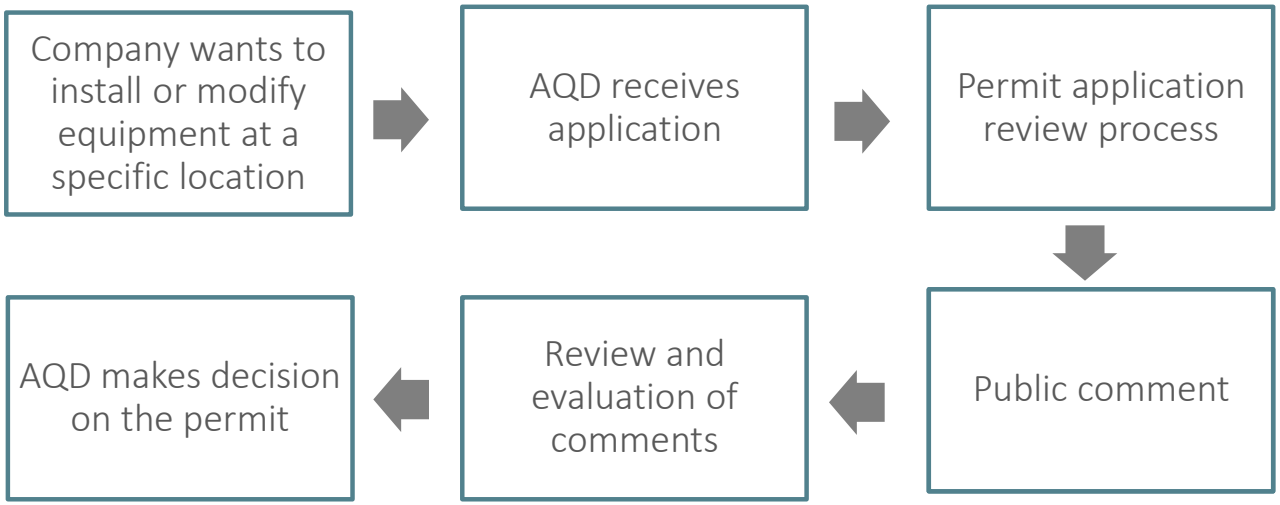
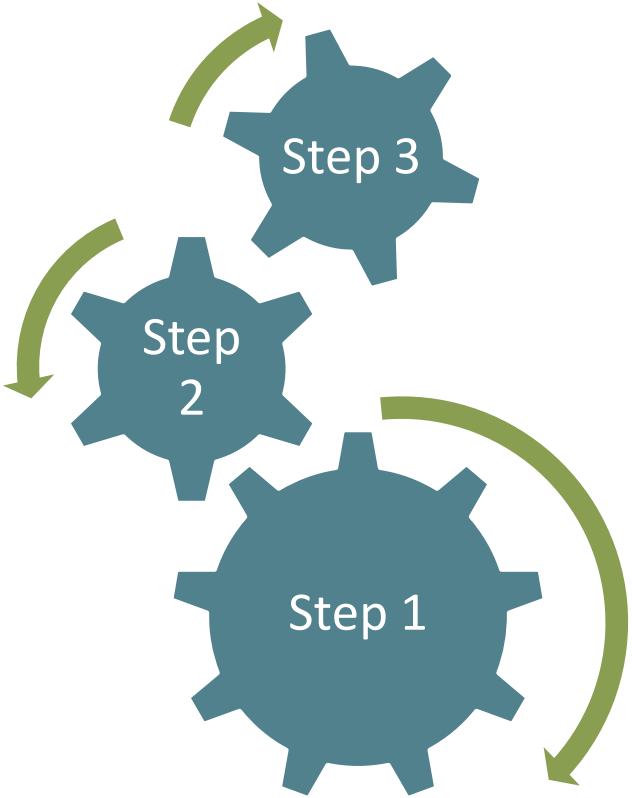
Permitting Process

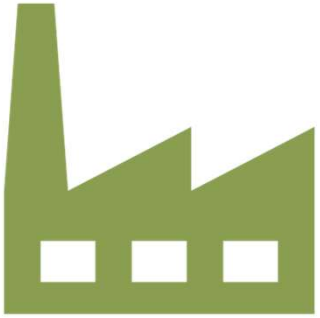


The Project

- Project description
  - Equipment description and diagrams
  - Operating schedule
  - Control Technology
  - Emission unit
  - Fuels and combustion devices
  - Other Equipment
- Source description/Operations
  - Process flow diagram

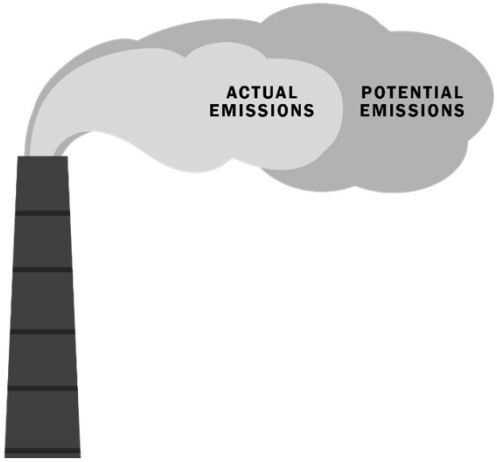


The Project



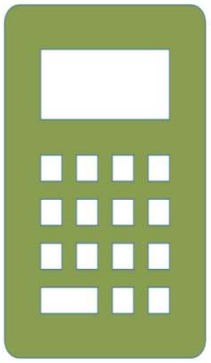
- Location Status - Greenfield or Existing
- Other Permits
- Type of facility
  - Title V
  - Prevention of Significant Deterioration (PSD)
  - Nonattainment New Source Review (NANSR)
  - Hazardous Air Pollutants (HAPs)

Project Emissions



- The project's Potential to Emit (PTE)
- Restricting the project's PTE?
  - Is the restriction enforceable?
- Any upstream or downstream changes

Emissions Summary and Calculations



- "How much of which pollutants"?
  - Central to determining which rules and regulations apply
  - Central to determining what the permit appropriate permit conditions
  - Less than potential to emit?
- Calculation method
  - Justification for emission factors
  - Criteria and Toxic Air contaminant
- Some regulations apply (or not) based on the amount and type of emissions.

Regulatory Discussion

- Discussion of all applicable federal regulations
- Discussion of all applicable state rules
- Complete information on emitted Toxic Air Contaminants
- Best Available Control Technology (BACT)
- Lowest Achievable Emission Rate (LAER)

Federal Rules to look at

NSPS IIII	• For compression ignition engines commence construction after July 11, 2005
NSPS JJJJ	• For spark ignition engines that commenced construction after June 12, 2006
NESHAP ZZZZ	• For all engines

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- NSPS naviga
- NESHAP nav

RICE NESHAP Summary of Requirements[1]

Emergency

New & Reconstructed Stationary Engine

Located at Area Source of HAP, constructed on or after June 12, 2006

Requirements: Engines are subject to 40 CFR part 60, subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines) or subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines), as applicable.

Per 40 CFR 60.4219:

Compression ignition means relating to a type of stationary internal combustion engine that is not a spark ignition engine.

Spark ignition means relating to a gasoline, natural gas, or liquefied petroleum gas fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark ignition engines usually use a throttle to regulate intake air flow to control power during normal operation. Dual-fuel engines in which a liquid fuel (typically diesel fuel) is used for CI and gaseous fuel (typically natural gas) is used as the primary fuel at an annual average ratio of less than 2 parts diesel fuel to 100 parts total fuel on an energy equivalent basis are spark ignition engines.

[1] Disclaimer: The content provided in this software tool is intended solely as assistance for potential reporters to aid in assessing requirements for compliance under the reciprocating internal combustion engines (RICE) National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 63 Subpart ZZZZ. Any variation between the rule and the information provided in this tool is unintentional, and, in the case of such variations, the requirements of the rule govern. Use of this tool does not constitute an assessment by EPA of the applicability of the rule to any particular facility. In any particular case, EPA will make its assessment by applying the law and regulations to the specific facts of the case.

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State Rules

205	VOC BACT (702)	224	225
• 500 hours of operation limit • Or fuel restriction	• Best combustion practices • Catalytic Oxidizer	• Best combustion practices	• Benzene, Formaldehyde, Acrolein

Dispersion Modeling

- Dispersion modeling for criteria pollutants:
  - PSD projects: submit modeling protocol and pre-construction monitoring waiver request beforehand
  - Policy and Procedure AQD-022
- Modeling for Toxics
  - Generic
  - Specific

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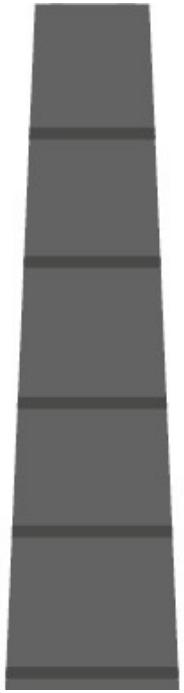
Stack/Vent Information

- Why is this important?
  - Regulations
  - Dispersion modeling
  - Permit conditions
- What we need for each emission point from the process
  - Location
  - Height above ground
  - Diameter or other perpendicular dimensions
  - Orientation of discharge
  - Describe rain protection
  - Exhaust flow rate (or range)
  - Temperature (or range) of exhaust gas
  - Height and horizontal dimensions of influencing buildings



Dispersion Modeling

- Criteria pollutants:
  - NOx
  - PM2.5
- TACs:
  - generic

The Technical Review is Complete, now What?

DRAFTING CONDITIONS

INTERNAL AND EXTERNAL REVIEW OF DRAFT CONDITIONS

PUBLIC COMMENT PROCESS?

PERMIT DECISION

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Questions?

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Helpful links

- Potential to Emit workbook
- NSPS navigation tool
- NESHAP navigation tool
- District Information
- Toxics webpage
- Modeling webpage