



**Environmental
Protection
Agency**

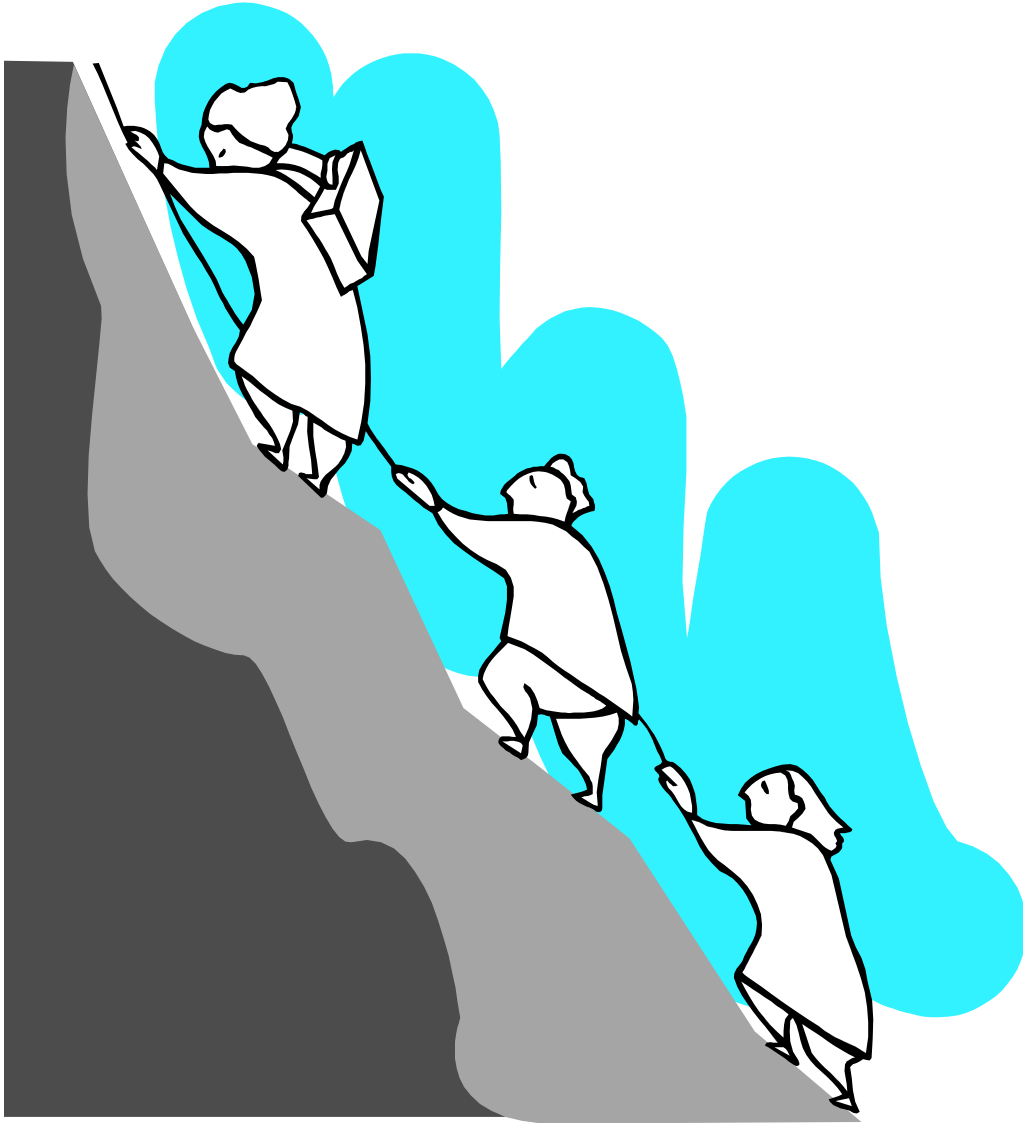
Association of Air Pollution Control Agencies

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Data Center Permitting



- Emissions Sources
- Summary of PSD Program
- Power Consumption
- Evolution of Data Centers
- Protecting Air Quality
- Public Participation

Data Centers/Emission Sources

- Typical Data Centers
- Power supplied from grid
- Only emission sources are emergency engines in case of power supply failure – fired with fuel oil
- The number of emergency engines keeps growing as the data centers become larger— latest application have over 400 emergency engines
- The engines run only for a few hours each month to make sure that they are functional if needed

Data Centers/Emission Sources



- Power from grid becoming in short supply
- How are data centers adjusting?
 - Third-party companies are building stand alone power plants to supplement electricity from the grid or
 - Building "Behind to Meter" power plants at the site so that the data center will not be connected to the grid – Natural gas fired turbines – 150 – 200 MW
- Plus, data centers are equipped with emergency engines in case of a power failure

NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT	PRIMARY		SECONDARY	
PARTICULATE MATTER (PM)	PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Annual mean avg over 3-yr		9.0 µg/m ³		15.0 µg/m ³
24-hr 98 th percentile avg over 3-yr		35 µg/m ³		35 µg/m ³
24-hr conc avg over 3-yr+	150 µg/m ³		150 µg/m ³	
SULFUR DIOXIDE (SO2)				
1-hr conc**	75 ppb			
3-hr conc+			0.5 ppm	
CARBON MONOXIDE (CO)				
8-hr avg conc+	9 ppm		+ not to be exceeded more than once per year ++ not to be exceeded +++ secondary standard same as primary for ozone, lead and annual NO2 * 98 th percentile of 1-hr daily max conc, avg over 3-yr ** 99 th percentile of 1-hr daily max conc, avg over 3-yr	
1-hr avg conc+	35 ppm			
OZONE (O3)				
8-hr conc, annual 4 th -high daily max, avg over 3-yr	0.070 ppm+++			
NITROGEN DIOXIDE (NO2)				
Annual mean	0.053 ppm+++			
1-hr conc*	100 ppb			
LEAD (Pb)				
Rolling 3-month avg++	0.15 µg/m ³ +++			

Summary of Prevention of Significant Deterioration Program (PSD)

- Created in the 70's to protect clean air areas from degrading to the NAAQS – i.e. National Parks/Wilderness areas
- Concept expanded to include all areas of the country that meet the NAAQS
- Set up how much air can be degraded based on classification on area:
 - Class 1 – most large National Parks/Forests/Wilderness areas
 - Class 2 – most of the country – including all of Ohio

Summary of PSD Program

Increment levels under the PSD Program:

Table 2. Ambient Air Quality Standards, SILs, and PSD Increments (All conc. in $\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	SIL	PSD Increments	NAAQS
CO	1-hour	2000	-	40,000
	8-hour	500	-	10,000
NO ₂	1-Hour	7.5	-	188
	Annual	1	25	100
PM ₁₀	24-Hour	5	30	150
	Annual	1	17	-
PM _{2.5}	24-Hour	1.2	9	35
	Annual	0.2	4	12

Summary of PSD Program

- This program is triggered by a PSD permit that sets the “baseline air quality” and limits the amount of air quality can degrade
- The baseline is pollutant specific – the baseline can be set for SO₂, but not for Particulate Matter or NO_x.



PSD Permit Source

- Now to the specifics
- Microchip production plant was permitted in September 2022 and set the baseline for the area around Franklin and Licking Counties.
- Was a major for NO_x, CO, VOCs, PM, PM₁₀, and PM_{2.5}
- There are PSD increments for:
 - PM₁₀ – Annual and 24 hour
 - PM_{2.5} – Annual and 24 hour
 - NO_x – Annual

Increment Consumption

Pollutant/ Averaging Period	Modeled Result ($\mu\text{g}/\text{m}^3$)	PSD Increment ($\mu\text{g}/\text{m}^3$)	$\frac{1}{2}$ Increment ($\mu\text{g}/\text{m}^3$)
PM ₁₀ 24-hr	7.271	30	15
PM ₁₀ Annual	1.481	17	8.5
PM _{2.5} 24-hr	6.779	9	4.5
PM _{2.5} Annual	1.276	4	2
NO ₂ 1-hr	181.533	--	188* *NAAQS
NO ₂ Annual	15.615	25 40 NAAQS	12.5

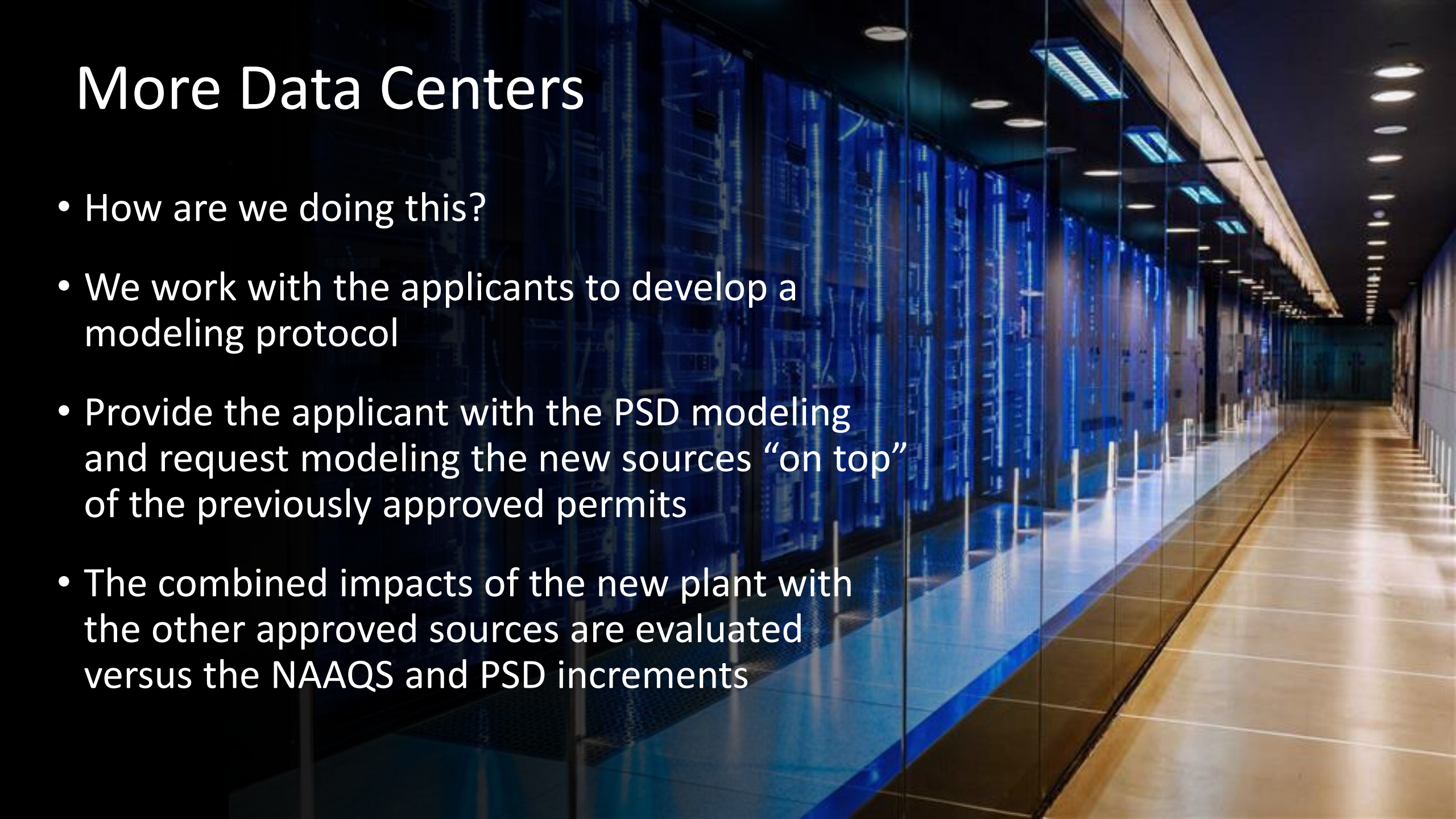
- Some proposals for the construction of data centers and power plants to accompany data centers – behind the meter
- Many of these proposals are close to PSD source
 - How can we permit these units and still protect air quality?
- These sources (some minor) consume PSD increments since PSD source sets the baseline
- The sources all have an air quality impact

Ohio EPA must ensure that any permits that are issued do not cause violations of the National Ambient Air Quality Standards or PSD increments.

More Data Centers

More Data Centers

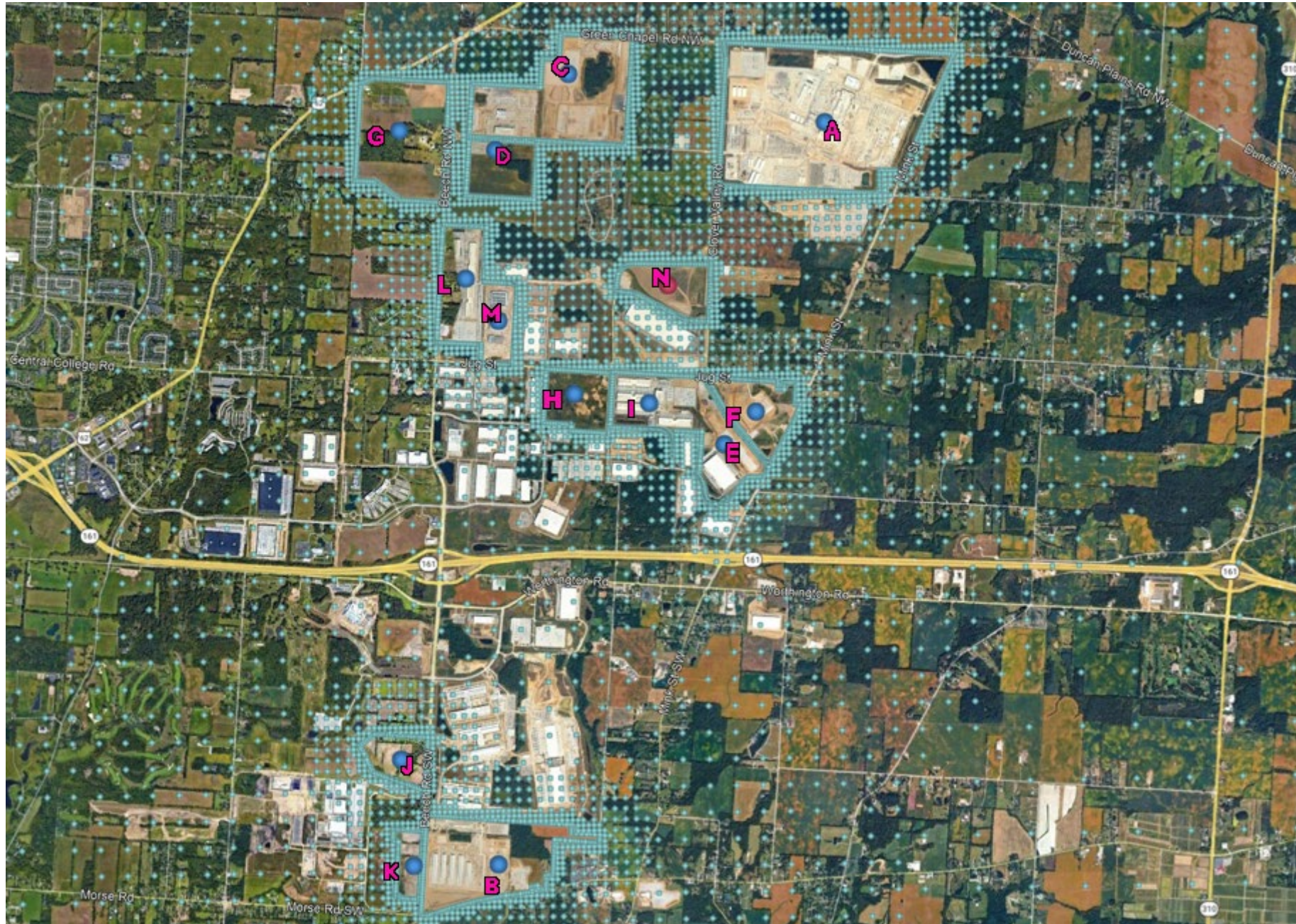
- How are we doing this?
- We work with the applicants to develop a modeling protocol
- Provide the applicant with the PSD modeling and request modeling the new sources “on top” of the previously approved permits
- The combined impacts of the new plant with the other approved sources are evaluated versus the NAAQS and PSD increments



Nearby Cumulatively Modeled Facilities Since Chips Ohio

Letter in Model	Facility Abbreviation	Site Center UTM Zone 17 Easting (m)	Site Center UTM Zone 17 Northing (m)	Included in NO ₂ Annual Modeling?	Included in PM _{2.5} 24-Hour Modeling?	Included in PM _{2.5} Annual Modeling?	Included in PM ₁₀ 24-Hour Modeling?	Included in PM ₁₀ Annual Modeling?
A	CHIPS	354200	4442200	Yes	Yes	Yes	Yes	Yes
B	WPPS	351000	4435300	Yes	Yes	Yes	Yes	Yes
C	WPPN	351800	4442700	Yes	Yes	Yes	Yes	Yes
D	CMH116	351100	4442000	Yes	No	Yes	No	Yes
E	ECXNAEC	353200	4439200	Yes	Yes	Yes	Yes	Yes
F	CONA	353500	4439500	Yes	No	No	No	No
G	CMH098	350200	4442200	Yes	No	Yes	No	No
H	MNTK-N	351800	4439700	Yes	No	No	No	No
I	CMH070	352500	4439600	Yes	No	No	No	No
J	QTS-NAL1	350100	4436300	Yes	No	No	No	No
K	QTS-NAL2	350200	4435300	Yes	No	No	No	No
L	CMH082	350800	4440800	Yes	No	No	No	No
M	VDCNA	351100	4440400	Yes	No	No	No	No
N	WPSTY	352700	4440700	Yes	Yes	Yes	Yes	Yes

Annual Average NO₂ – 14 Modeled Facilities and Nearby Receptors





- Ohio does not receive that many requests for public hearings for air sources.
- Certain source categories attract attention
 - Data centers are now the latest “hot topic” source category

Public Participation Trends

Ways to Assist in the Permit Process

- Contact Ohio EPA early in project
- We have “preapplication meetings” – can keep information confidential if necessary
- We make a determination that application is complete – can move forward with review
- Set up biweekly or even weekly calls with company/agency to discuss progress on permit
- Swap information informally to make sure application is on track
- Read draft of permit / make sure that conditions can be met

Just Announced!

- 9.2 GW natural gas power plant
 - Proposed largest in the country
- 10 GW data center
 - Site will be rural southern Ohio on Department of Energy site
 - Site formerly used to enrich uranium



Questions?

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