Cricket Valley Energy

Advisory Working Group

Air Quality

October 6, 2011

Project Update

- Draft Environmental Impact Statement (DEIS)
  - Public Comment period closed on August 5, 2011
  - Comments collected by DEC – CVE will respond to all comments in FEIS
- Final Environmental Impact Statement (FEIS)
  - Submittal expected by the end of 2011
- Local Permitting
  - CVE project requires Town of Dover Special Permit & Site Plan Review
  - Review of Special Permit Application will take place after FEIS submittal
- Other Activities
  - Phase II Environmental Site Assessment – will identify items for remediation
  - Alternative Parking Areas – CVE is investigating additional parking areas to reduce traffic impacts; subject of Thursday, October 13th meeting

Agenda

Air Quality & Cricket Valley Energy

- Regulations & enforcement
- Key findings based on data

How did CVE assess air quality impacts?

- Dispersion Modeling Approaches & Results
- Monitor Locations – What would a local monitor tell us?
- How was CVE's modeling approach approved?

Questions we've heard

- Stagnant Air
- Inversions
- Proximity to school

Air Quality & Cricket Valley Energy

Cricket Valley Energy

What regulations must CVE comply with?

- National Ambient Air Quality Standards (NAAQS)
- Nonattainment New Source Review (NNSR)
- Prevention of Significant Deterioration (PSD) New Source Review
- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- Cross-State Air Pollution Rule (CSAPR)
- Acid Rain Program (Title IV)
- New York State Additional Requirements
  - Sulfur in fuels
  - Visible emissions
  - CO_2 Budget Trading Program
  - Accidental release requirements

What must the applicant prove to receive a permit?

- Project impacts protect the health of the most vulnerable individuals
- Complies with National Ambient Air Quality Standards and Prevention of Significant Deterioration Increments
- Impact of non-criteria (toxic) pollutants are below health-based guidelines
- Contribution to acid rain is insignificant
- “Worst-case” hypothetical release of ammonia poses no offsite risk
- No significant or disproportionate impact to disadvantaged (Environmental Justice) communities
- No significant visibility impact at closest state park/natural resource
- No significant effect on soils/vegetation

How do we assess air quality impacts?

Dispersion Modeling Approach

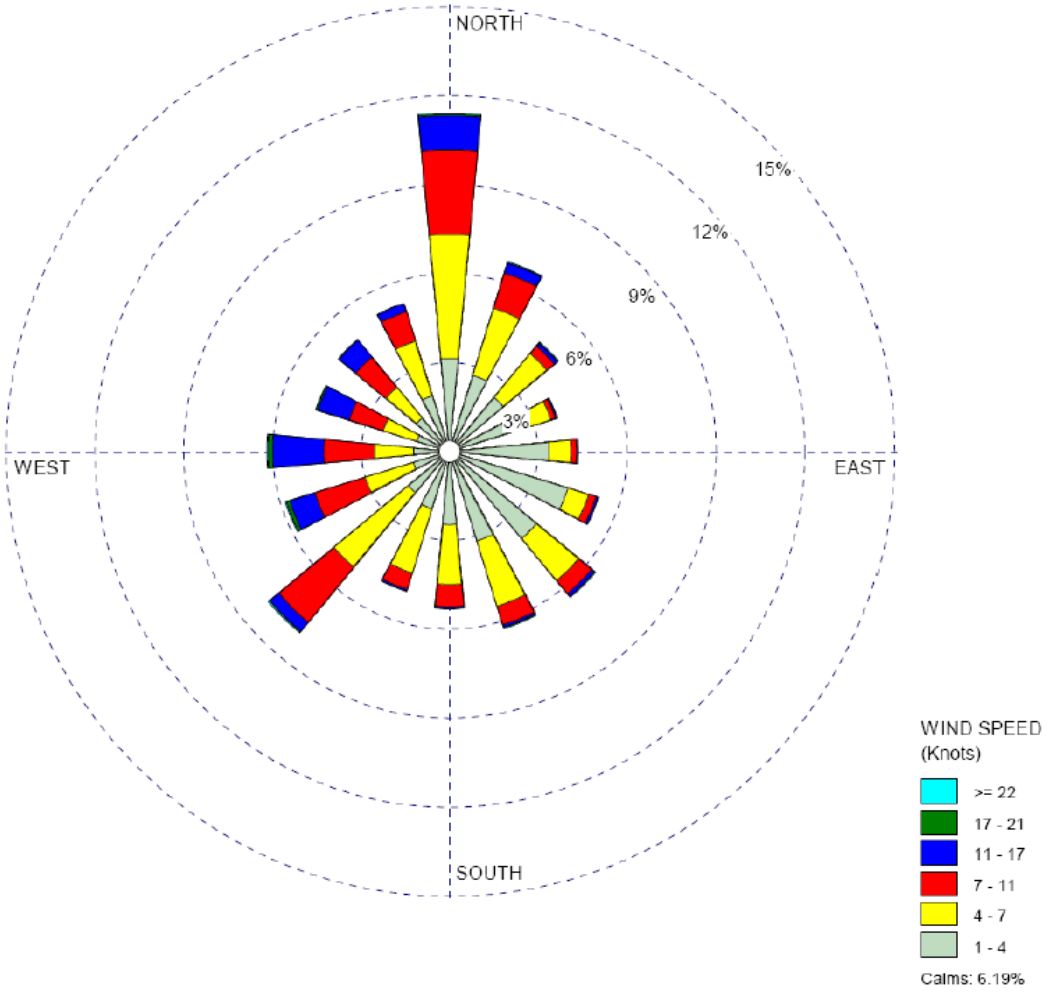
- AERMOD
  - State of the art EPA Guideline Model
  - Designed for power plants and other industrial sources
  - Accounts for transport and dispersion, plume rise, building wake downwash, terrain and land use
- Protocol developed following EPA and NYSDEC guidance, approved by both agencies
- Five years of meteorology (National Weather Service stations - Poughkeepsie, Albany)
  - 43,824 hours - full range of possible dispersion conditions (wind direction, wind speed, atmospheric stability)
- Predicted impacts for receptor array with 1,507 points (to 8 kilometers)

WIND ROSE PLOT:

Wind Rose for March 10, 2005 - March 9, 2010

DISPLAY:

Wind Speed
Direction (blowing from)



Predicted Impacts of CVE

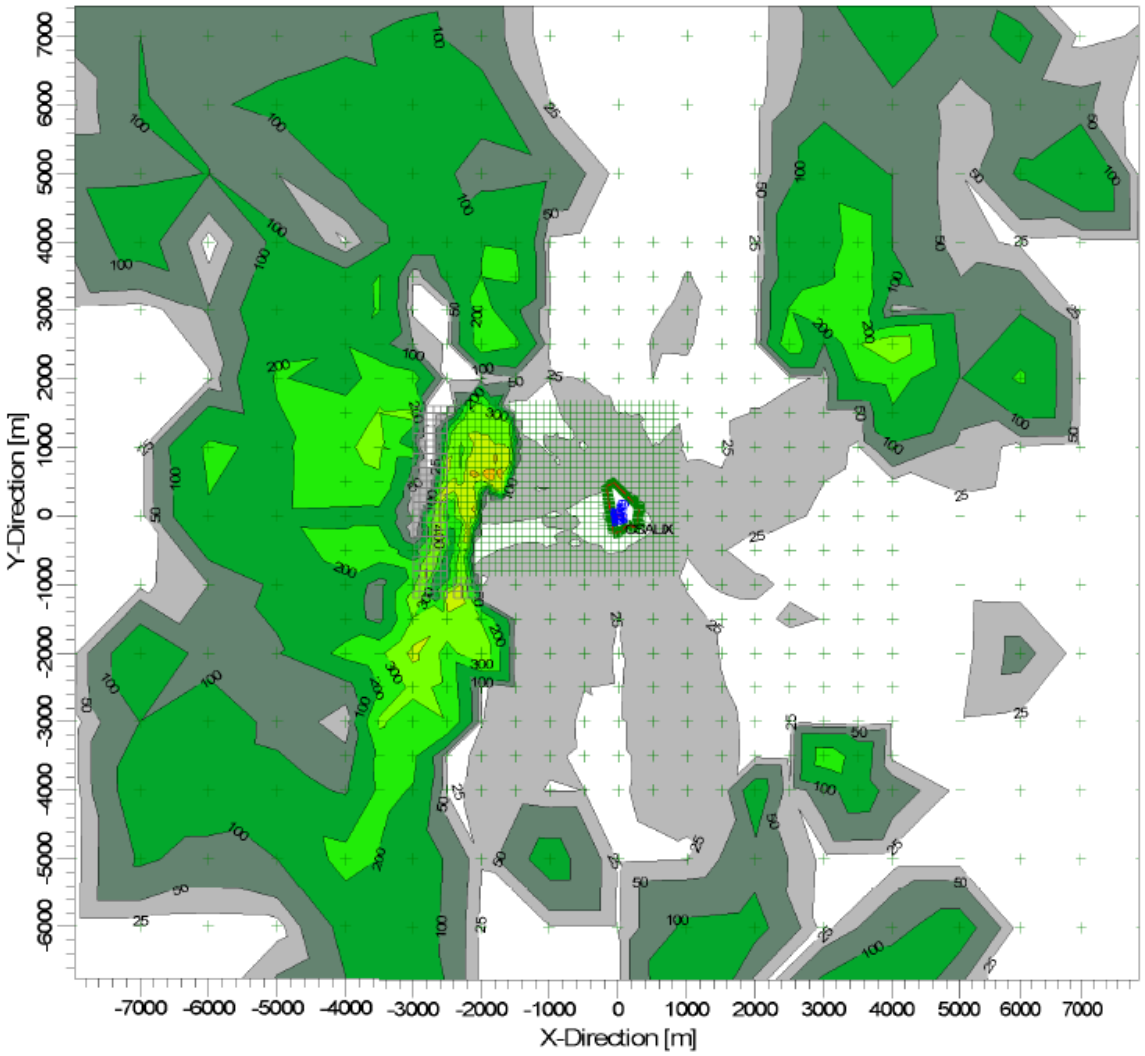
Pollutant	Averaging period	Maximum Impact (µg/m3)	**Significant Impact Level** (µg/m3)	**NAAQS** (µg/m3)
Sulfur dioxide	1-hour	6.8	7.8	195
	3-hour	3.24	25	1,300
	Annual	0.9	1	80
PM-2.5	24-hour	**3.0**	1.2	35
	Annual	0.3	0.3	15
PM-10	24-hour	4.9	10	150
	Annual	0.43	n/a	50
CO	1-hour	1,484	2,000	40,000
	8-hour	343	500	10,000
NO2	1-hour	**68.6**	7.5	188
	Annual	0.57	1	100

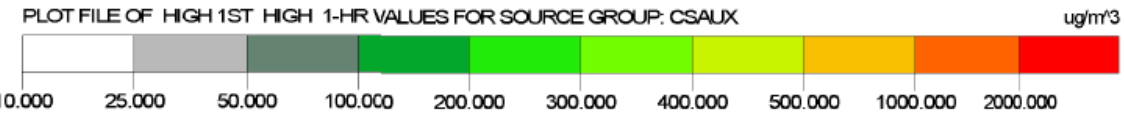
Predicted maximum 1-hour impacts for CO

- The spatial pattern reflects high terrain. Peak predicted impacts for CO are on elevated terrain, west of CVE
- Impacts are insignificant at all locations. Maximum concentration (1,484 µg/m3) is below EPA SIL (2000 µg/m3) and far below NAAQS (40,000 µg/m3).
- Peak location is opposite to prevailing winds
- Impacts in valley are lower than peak prediction by factor of 30
- These are maximum of 43,824 hours – all combinations of wind speed and direction, including thousands of “inversion” hours

PROJECT TITLE:

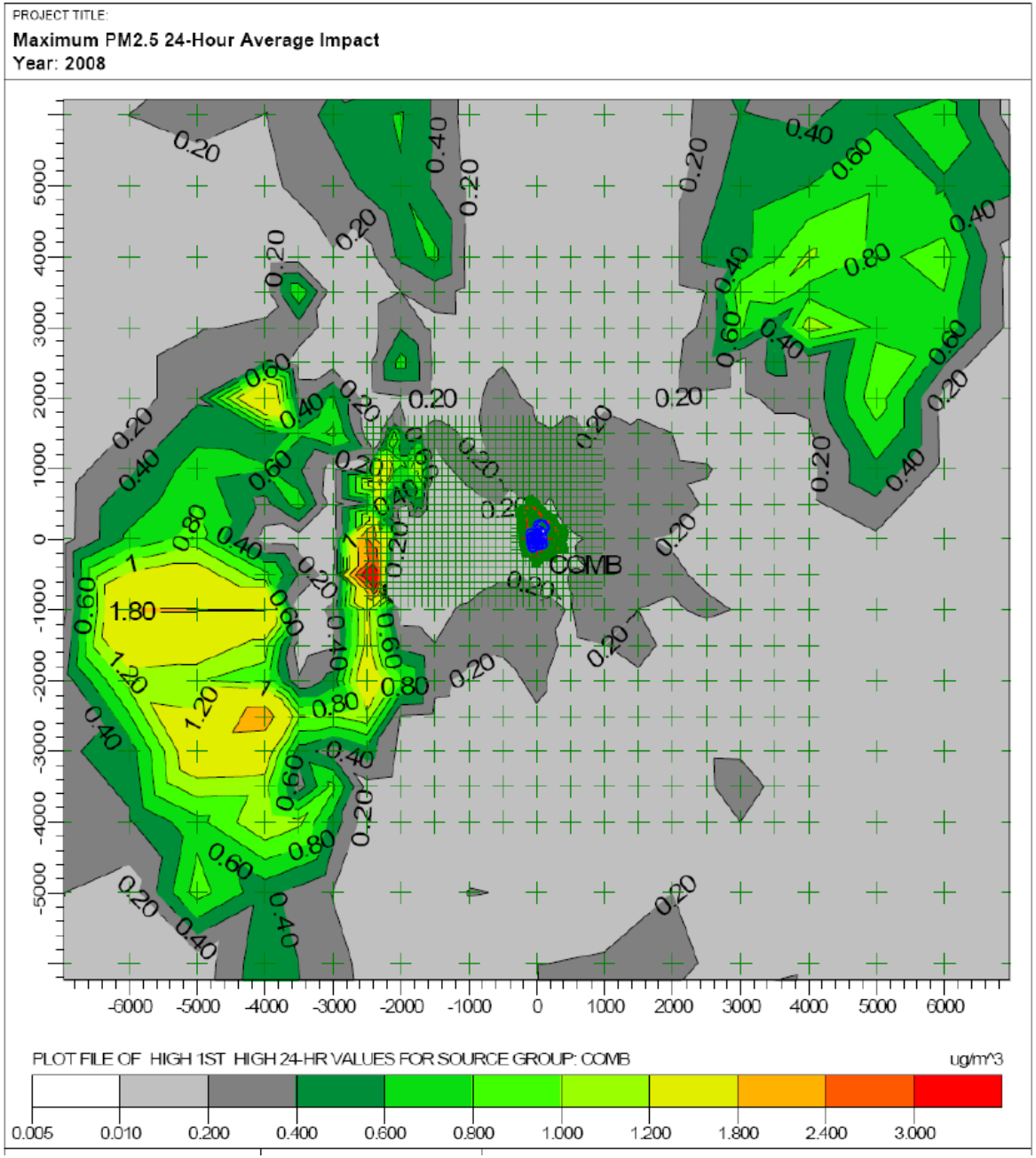
Predicted 1-Hour CO - Maximum 1-Hour Average
Cricket Valley Energy - Cold Start with Auxiliary Boiler, 2005





Spatial pattern of 24-hour maximum predicted impacts

- Peak predicted impacts are on elevated terrain, west of CVE (opposite to prevailing winds)
- Maximum concentration (3.0 µg/m3) is above EPA SIL (1.2 µg/m3) but far below the NAAQS (35 µg/m3). With impact above SIL, multi-source modeling for PM-2.5 was required.
- The only locations where significant impacts were predicted are on elevated terrain west of CVE.
- Impacts in valley are below SIL by factor of 4, and below maximum by a factor of 10.


PROJECT TITLE:
Maximum PM2.5 24-Hour Average Impact
Year: 2008
COMB
PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: COMB
ug/m^3
0.005
0.010
0.200
0.400
0.600
0.800
1.000
1.200
1.800
2.400
3.000

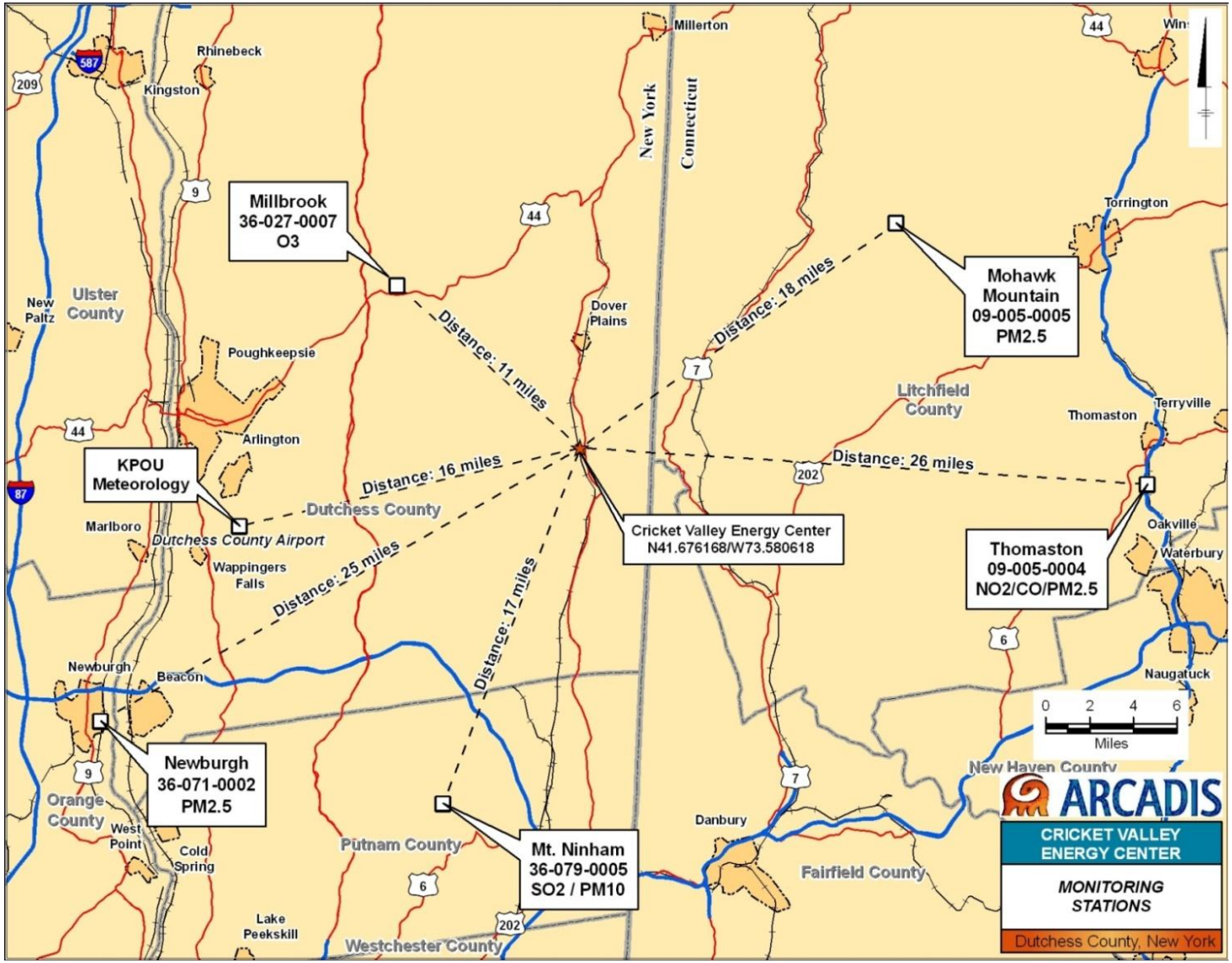
Multi-source modeling results for PM-2.5

- Multi-source modeling included other significant sources within 6 km of CVE, and major sources of PM-2.5 emissions out to 56 km distance
- The highest predicted impacts are caused by other emission sources in the region
- No contribution from Cricket Valley Energy at the time or location of those high predicted impacts
- Within the valley, predicted PM-2.5 impacts are dominated by other sources

Background Air Quality

- Goal = determine background values representative of regional air quality, to add to modeled impact of local emission sources
- Good network of sites in Hudson Valley and NW Connecticut
- Consistent readings across the region

Air Quality Monitoring Stations



Background Concentrations

Pollutant	Averaging period	Background (µg/m3)	**NAAQS** (µg/m3)
Sulfur dioxide	1-hour	57.2	195
(Mt Ninham)	3-hour	42.0	1,300
	Annual	4.5	80
PM-2.5	24-hour	24.6	35
(Thomaston)	Annual	8.8	15
PM-10	24-hour	39	150
(Mt Ninham)	Annual	14	50
CO	1-hour	1,650	40,000
(Thomaston)	8-hour	1,200	10,000
NO2	1-hour	122.8	188
(Thomaston)	Annual	14.7	100
Ozone (Millbrook)	8-hour	73 ppb	75 ppb

Questions We've Heard

Cricket Valley Energy

What about inversions?

- Surface-based inversions trap emissions from low-level sources near the surface. Inversion conditions inhibit vertical mixing (upward or downward).
- Buoyant plumes from tall (GEP) stacks remain aloft during stable conditions. Peak impacts from these sources are usually predicted during unstable (convective) conditions, with active vertical mixing, or on elevated terrain.
- During an inversion, the temperature aloft will be at most a few degrees above temperature at the surface. The CVE exhaust plume is emitted at 225 F, buoyant under any atmospheric conditions.

What about low winds?

- Low-level emission sources have peak impacts with near-calm conditions. As wind speed increases, the predicted concentration falls (dilution effect).
- Buoyant plumes rise higher with light winds; this elevates the plume higher above the ground surface and counters the dilution effect. The tradeoff between dilution and buoyancy depends on the source and on local topography. Peak impacts for CVE are predicted for moderate to high wind speeds, not for near-calm conditions.

What air modeling results tell us

- Peak impacts from CVE will occur on elevated terrain to the west.
- No dispersion conditions (including inversions) cause significant impacts at lower elevations in the valley.
- Regional background concentrations are fairly uniform from the Hudson Valley into northwest Connecticut.
- A monitor at Dover HS would experience some impact from other local/regional sources. It would detect little or no impact from CVE.

Questions & Contacts

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