

FEDERAL LAND MANAGERS CLASS I ISSUES



TOPICS

- Major Source Permits
- Permitting Issues
- CALMET Issues
- CALPUFF

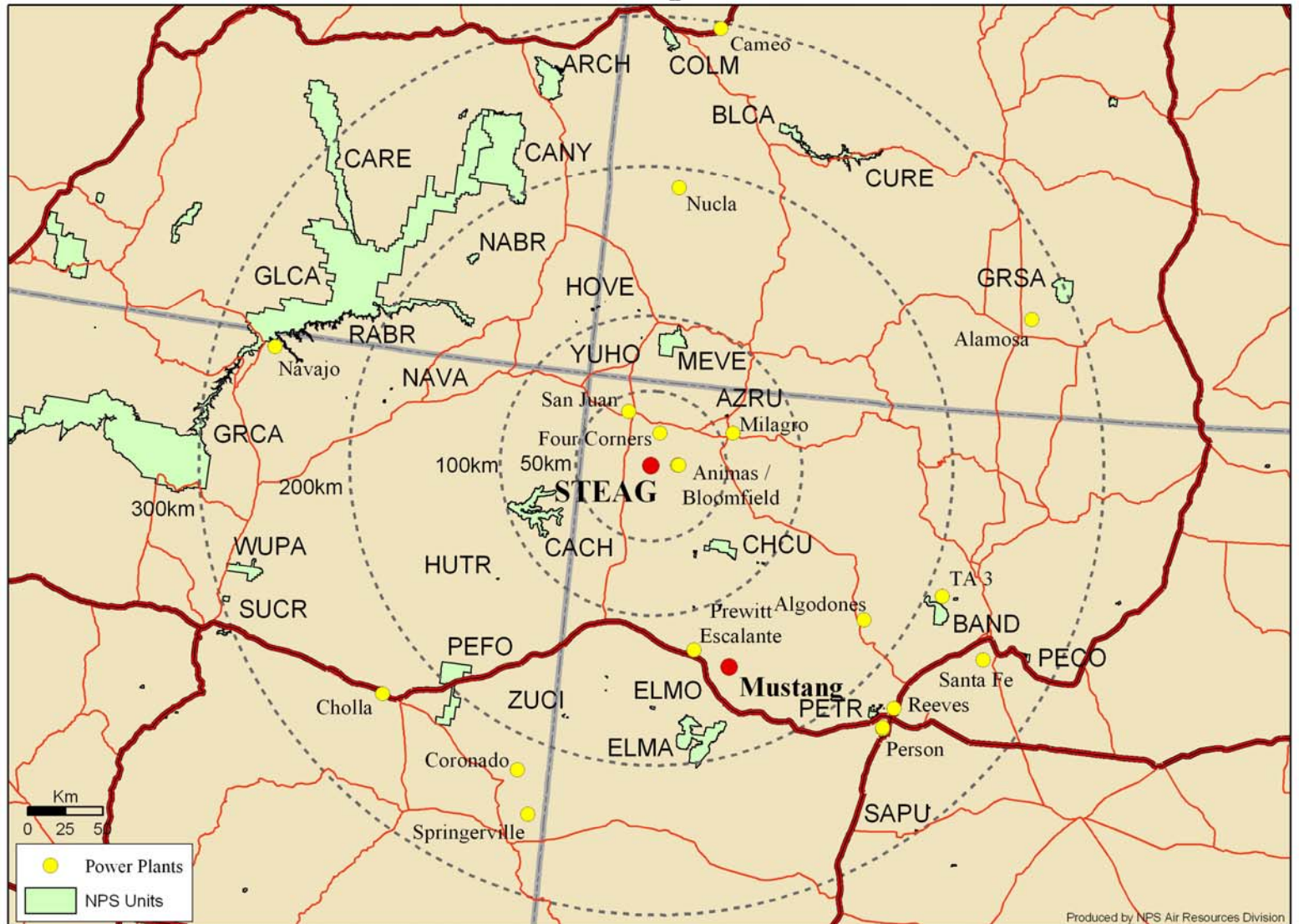
Coal Fired Power plants

- Latest count is >100 coal fired power plant applications nationwide
- NPS has > 18 applications in house
 - Most near 4 Corners area and SHEN and MACA
- FWS has 3 applications in house
- USFS numbers similar NPS

NEW COAL POWER PLANTS NEAR NPS/FWS AREAS

- KY 4-current
- GA 1-current
- IL 1-near future; 1-recent past
- PA-3 current
- ID 1- near future
- NV 2-near future
- ND 2-current
- WY 1-current; 1near future
- UT 1-current; 1 near future; 2 recent past
- MT 2-near future
- NM-2 current
- CO-2 current

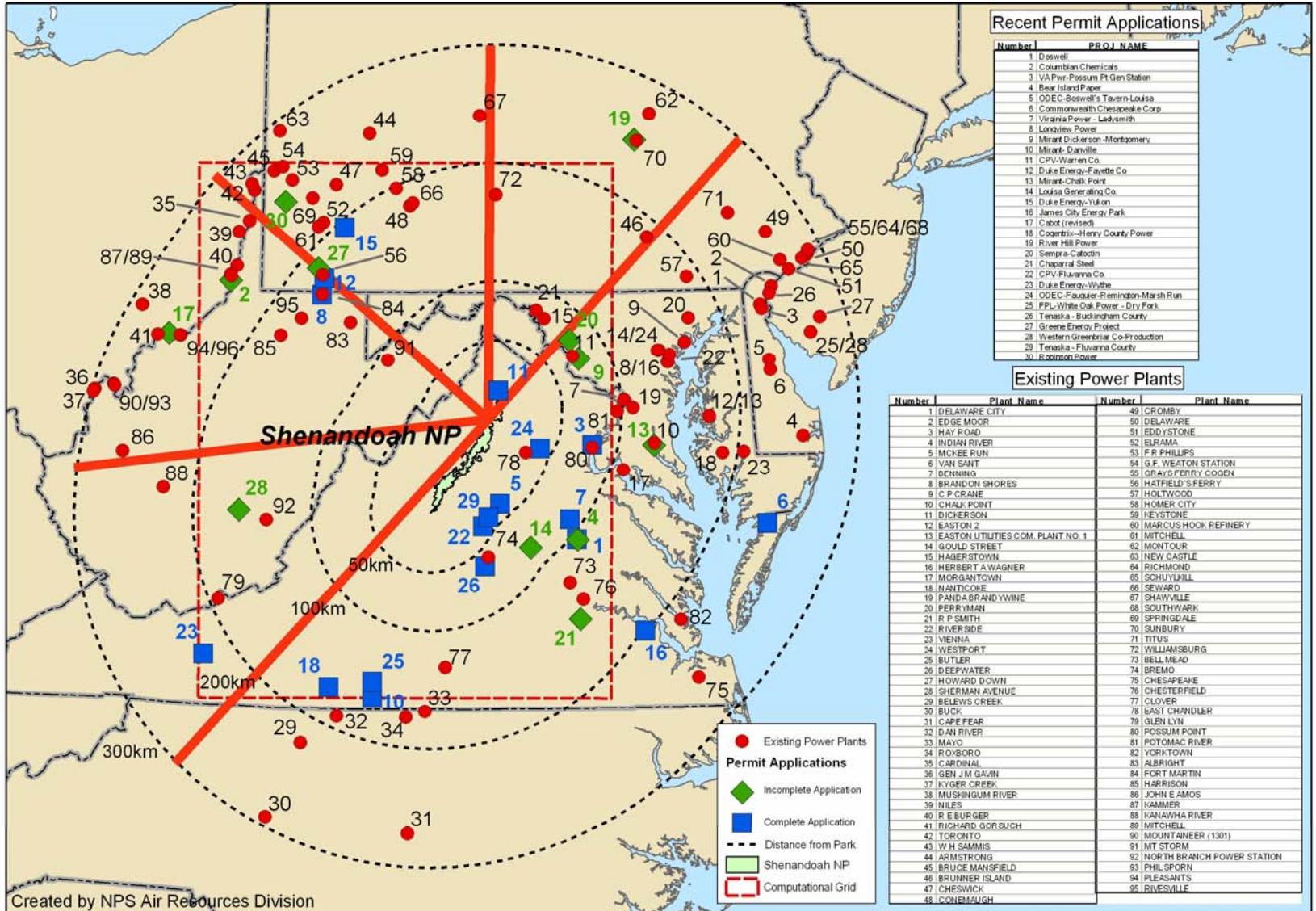
STEAG Impact Area



OTHER ISSUES

- Mitigation of AQRV impacts through offsets
- New power plants NETTING out of PSD & increment & AQRV analyses
 - usually for SO₂ and NO_x
- Unresolved modeled increment violations
- Need for additional NH₃ background levels

Existing Power Plants and New PSD Sources Near Shenandoah NP



Other Projects

4 CORNERS CUMULATIVE
ANALYSIS

BRENTON ISLAND SO₂ STUDY

FLORIDA CLASS I SO₂ STUDY

RPOs

PROCEDURES/LEGAL

- See attachment
- 40 CFR 51.307
- Sec. 51.307 New source review.
- (a) For purposes of new source review of any new major stationary source or major modification that would be constructed in an area that is designated attainment or unclassified under section 107(d)(1)(D) or (E) of the Clean Air Act, the State plan must, in any review under Sec. 51.24 with respect to visibility protection and analyses, provide for:
 - (1) Written notification of all affected Federal Land Managers of any proposed new major stationary source or major modification that may affect visibility in any Federal Class I area. Such notification must be made in writing and include a copy of **all information** relevant to the permit application **within 30 days** of receipt of **and at least 60 days prior to public hearing** by the State on the application for permit to construct. Such notification must include an analysis of the anticipated impacts on visibility in any Federal Class I area,
 - (2) Where the State requires or receives advance notification (e.g. early consultation with the source prior to submission of the application or notification of intent to monitor under Sec. 51.24) of a permit application of a source that may affect visibility the State must notify all affected Federal Land Managers within 30 days of such advance notification, and....

40 CFR 51.307

Sec. 51.307 New source review

- FLMs need Relevant Information 60 days before public hearing:
 - Permit application
 - Draft Permit with emission limits; both short and long term limits
 - Staff analyses BACT, Modeling
 - Copy of Public Notice

CALMET METEOROLOGICAL DATA

- How many years of MM data
 - 1 year is no longer allowed
 - 3 years with MM data is acceptable
 - 5 years with MM data in the future
- CALMET/MM prognostic data (MM4-1990, MM5-1992, MM5-1996)-available from NPS/FWS
- MM5 for 2002 available from VISTAS & CENRAP
CALMET ready ?
- FWS creating MM5: 2001, 2000, 1999, 1998, 1997
 - 36*36km CALMET ready
 - Consistent with same data sets generated with same method
- FWS will create MM5: 2001, 2000, 1999, 1998, 1997
 - 12*12km CALMET ready
 - Consistent with same data sets generated with same method

METEOROLOGICAL DATA

- If MM5 is used then:
- The need to determine if CALMET wind field is representative.
 - Compare to NWS maps and data & wind rose
 - Use software (i.e.) (METEVAL)-PC or LAKES VIEW Product or PAVE-UNIX
- Refined CALPUFF should not use just MM data alone = (NOOBS)
 - not in lieu of no SFC or UA data
 - cannot use MM data precip field alone

New years of MM5 or RUC-2

- RPO's are evaluating the performance of new MM5 years with statistical programs (i.e.)
- METSTAT
- Rapid Update Cycle (RUC-2)
 - FLMs concern is RUC is a diagnostic analysis tool & needs performance evaluation against observations & MM5
 - Parameters- Ws, Wd, RH, Precip, Vertical profile
 - Been applied in very limited situations (4) -usually when MMx data was not available or appropriate
 - Older RUC 40*40km
 - New RUC 20*20km Earth Tech and Wind Logic
 - WRF (to replace MM5) is now just a prognostic/forecast tool with no nudging with observations like current MM5; unknown when it will be ready for dispersion modeling

CALMET non-Defaults

- The following is a list of “non-default” switches and ranges of values. There is no right answer, but there are better ones!
- No. X grid cells (NX) No default ! NX = 116 !
- No. Y grid cells (NY) No default ! NY = 151 !
- Grid spacing (DGRIDKM) Units: km No default !
DGRIDKM = 3. !
- *Suggestion: Make sure the domain covers the entire area of interest allowing for flow to travel and reverse back. Typical values range from 50-80km beyond all receptors and sources. Typical grid resolution should be from 1-4km*

CALMET non-Defaults

- No. of vertical layers (NZ) No default ! NZ = 9 !
- Cell face heights in arbitrary vertical grid (ZFACE(NZ+1)) Units: m
No defaults
- ! ZFACE = 0.,20.,50.,100.,200.,400.,800.,1500.,2500.,3500. !
- *Suggestion: 6-10 vertical layers are recommended.*

- Minimum overland mixing height Default: 50. ! ZIMIN = 50. !
(ZIMIN) Units: meters
- Maximum overland mixing height Default: 3000. ! ZIMAX =
3000. ! (ZIMAX) Units: meters
- *Suggestion: ZIMAX must < ZFACE ~3-500m*

CALMET non-Defaults

- Maximum radius of influence over land in the surface layer (RMAX1) Units: km
No default ! RMAX1 = 30. !
- Maximum radius of influence over land aloft (RMAX2) Units: km
No default ! RMAX2 = 100. !
- Maximum radius of influence over water (RMAX3) Units: km
No default ! RMAX3 = 500. !
- *Suggestion: Influence increases in flat areas, shrinks in complex terrain. That said, surface stations are good from 50-100km (longer over water). Aloft refers to balloon sounding. They are good from 100-500km.*
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- Radius of influence of terrain features (TERRAD) Units: km No default !
TERRAD = 10. !
- *Suggestion: This should be the wavelength between terrain peaks in kilometers.*

CALMET non-Defaults

- Relative weighting of the first guess field and observations in the SURFACE layer (R1)
Units: km No default
- (R1 is the distance from an observational station at which the observation and first guess field are equally weighted)
- ! R1 = 10. !
- Relative weighting of the first guess field and observations in the layers ALOFT (R2) Units: km No default
- (R2 is applied in the upper layers in the same manner as R1 is used in the surface layer).
- ! R2 = 30. !

- *Suggestion: People will give a very low value to these settings to emphasize the MM5 or RUC fields. This can lead to stronger surface winds and wash out dispersion issues. Surface observations should range 10-100km, soundings 50-500km. (RPROG is a new switch with little data)*

CALMET Default

- Layer-dependent biases modifying the weights of
- surface and upper air stations (BIAS(NZ))
- $-1 \leq \text{BIAS} \leq 1$
- Negative BIAS reduces the weight of upper air stations
- (e.g. BIAS=-0.1 reduces the weight of upper air stations
- by 10%; BIAS= -1, reduces their weight by 100 %)
- Positive BIAS reduces the weight of surface stations
- (e.g. BIAS= 0.2 reduces the weight of surface stations
- by 20%; BIAS=1 reduces their weight by 100%)
- Zero BIAS leaves weights unchanged ($1/R^{**2}$ interpolation)
- Default: NZ*0
- $! \text{BIAS} = 0, 0, 0, 0, 0, 0, 0, 0, 0 !$

CALPUFF

- Guidance in IWAQM 2 & FLAG
- FIXED CLASS I Receptor Grids for all 156 areas
- CALMET grid (4km-1.5 & 1.0 km)
- CALMET & CALPUFF settings must stay fixed for the different years
- CALPUFF must be executed for run length----- **not monthly**—must use RESTART for < 1 year
- For **short term** increments and visible haze, need to model **short term** w/State emission limits.
- Pounds per hour or Pounds per MMBtu, etc
- Annual increments and acid deposition can use annual TPY emission limits for total Sulfur & Nitrogen
- Method used to compute dispersion coefficients (MDISP)
Default: 3 ! MDISP = 3
- *Suggestion: NOT 2 = dispersion coefficients from internally calculated*
- *sigma v, sigma w using micrometeorological variables*
- *(u*, w*, L, etc.)*
- CALPUFF<50 km: if flow is complex

PM SPECIATION for VISIBILITY IMPACTS

PM-coarse

PM-fine

Elemental Carbon

Secondary Organic Aerosols

Sulfuric Acid Mist

Pulverized Coal boilers

Circulating Fluidized Bed boilers

Natural Gas Turbines

Oil Fired Turbines

http://www2.nature.nps.gov/air/Permits/emissions_ControlTech.htm

EMISSION SOURCES

- New Sources- same emissions for new facility as Class II analysis (usually not fugitives)
- Cumulative Class I increment analysis for pollutant & averaging time > EPA Class I SIL
 - All major/large sources up to 300 km **from** Class I area
 - Minor sources < 50km **from** Class I area-not same minor source inventory as Class II
 - Emissions=State's permit limit for averaging time--usually short term limits

FLM INFORMATION AVAILABLE AT:

- <http://www.nature.nps.gov/ard/>
- <http://www.nature.nps.gov/ard/fws/fwsaqb.html>
- <http://www.aqd.nps.gov/ard/flagfree/>
- <http://www.epa.gov/ttn/nsr/techinfo.html>
- http://www2.nature.nps.gov/air/Permits/emissions_ControlTech.htm
- <http://www2.nature.nps.gov/air/maps/Receptors/index.htm>
- <http://www.epa.gov/scram001/t29.html>