Informational Meeting

May 5, 2008

Housekeeping

- Please either turn all electronic equipment (i.e. cell phones, pagers, etc.):
  - Off,
  - Silent, or
  - Vibrate

Introductions

- David Phelps
- Christopher Roling, PE
- Lori Hanson
- Christine Spackman

Purpose of meeting

- Information on air quality permitting process
  - Not taking comments on project at this time
  - Early in application review
    - IPL still has information to submit
    - Many determinations yet to be made
    - Please limit questions to permitting process

IPL Proposal

- Unit 4 @ Sutherland Generating Station
- Base load unit
- 649 MW (net)
- Maximum heat input of 6,326 million British thermal units per hour (MMBTU/hr)
- Supercritical pulverized coal-fired boiler

IPL Proposal (cont.)

- Fuels
  - Natural gas for startup
  - Sub bituminous Powder River Basin (PRB) coal from Wyoming & Montana
    - primary fuel
  - Bituminous coal
    - up to 10%
  - Biomass

Clean Air Act (CAA)

- 1970
- Statutory basis for federal regulations
- Significant amendments in 1990
- Two basic air quality management strategies
  - Ambient air standards
  - Emission limitations
- 6 Titles in Act (11 in 1990 Amendments)

Title I of CAA

- National Ambient Air Quality Standards (NAAQS)
- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- New Source Review (NSR)

NAAQS

- Based on health & welfare criteria
  - Protects sensitive populations
- Apply nationwide
- 6 Pollutants (criteria pollutants)
  - Fine particulate (PM_{10})
  - Sulfur dioxide (SO_2)
  - Nitrogen oxides (NO_x)
  - Carbon monoxide (CO)
  - Ozone
  - Lead (Pb)
- Attainment vs. nonattainment

NSPS (Section 111 of CAA)

- Apply to specific new, modified, or reconstructed source categories
  - Examples:
    - Utility boilers
    - Portland cement plants
    - Organic liquid storage tanks
- Concentrates on criteria pollutants
- Found in Part 60 of Code of Federal Regulations (CFR)

Section 112 of CAA

- “Old” NESHAP (pre 1990)
- “New” NESHAP
- Risk based standards
- Accidental release prevention
- Urban air toxics program

NESHAP

- Pre 1990 standards
  - Risk based
  - Found in Part 61 of CFR
- Post 1990 standards
  - Technology based
  - Also termed maximum achievable control technology (MACT) standards
  - Mandated source category schedule
  - Found in Part 63 of MACT

New Source Review (NSR)

- Basic goals
  - Ensure economic growth with preservation of existing clean air resources
  - Protect public health & welfare from adverse effects
  - Preserve, protect, and enhance air quality in areas of special interest (i.e. recreational, scenic, historic, etc.)
  - Provide opportunity for public comment on proposed applications

New Source Review (NSR) Overview

- Three Distinct Programs
  - Minor New Source and Minor Modification (40 CFR 51.160)
  - Major New Sources and Major Modifications in
    - Attainment Areas (Prevention of Significant Deterioration, PSD)
    - Nonattainment Areas
- EPA Rules Focus on Major Sources and Modification

Areas of NSR Permitting

- Attainment or unclassifiable
  - Area is considered to be meeting NAAQS
  - Permits issued under Prevention of Significant Deterioration (PSD) program
    - IPL project is being reviewed under this program
    - PSD program does not specifically address toxic air pollutants
- Nonattainment
  - Area is not meeting NAAQS
  - Permits issued under nonattainment NSR
  - Currently no nonattainment areas in Iowa
    - $PM_{2.5}$ issues in two counties

History of PSD Program

- Originated in lawsuit requiring EPA to protect clean air areas
- First rule promulgated 12/5/74
- 1977 Act included PSD program
- Rule revised in 1978 to reflect Act
- EPA sued, promulgates new rule 8/7/80
- 1990 Amendments had little effect

PSD Implementation

- 3 approaches
  - EPA-approved State PSD rule (SIP approved)
    - Iowa is this type
  - State implements EPA Rule (Delegated)
  - EPA implements EPA Rule

Types of Air Quality Permits

- Pre-construction
  - Issued under New Source Review (NSR) program
  - Required for all physical & operational changes

- Operating
  - Also called Title V
  - Required for larger companies
  - Company pays fees on emissions

Iowa PSD Permitting Process

- Company starts pre-construction monitoring (if required)
- Premeeting with company
- Company submits application
- Department reviews application
- Draft permits sent out for public comment
  - 30 days
  - Includes a public hearing
- Department responds to all comments and sends copy of responses to all interested parties
- Permits issued if the project has the potential to meet regulations

PSD Review Items

- Best Available Control Technology (BACT)
  - Case-by-case determination
  - Sets stringent limits on criteria pollutants (Particulates, SO_2, NO_x, CO, VOC, and Pb) based on best control technologies
  - Determined by the regulating agency
  - Takes into account environmental, economic, and energy impacts from control technology

BACT Process (Top-Down)

- Identify all control technologies
- Determine technical feasibility
- Rank control technologies
- Applicant evaluates & proposes BACT
- Reviewing agency reviews & sets BACT

PSD Review Items (cont.)

- New Source Performance Standards (NSPS)
  - Technology based standards for specific industries
  - Federal standards
  - Pollutants regulated at power plants
    - Particulate matter
    - Sulfur dioxide (SO_2)
    - Nitrogen oxides (NO_x)
  - Subpart Da (40 CFR 60.40Da)

PSD Review Items (cont.)

- National Emission Standards for Hazardous Air Pollutants (NESHAP)
  - Federal standards for toxic air pollutants for specific industries
  - Power plants
    - Rollercoaster history

Hazardous Air Pollutant (HAP) History for Power Plants

- October 1994
  - EPA enters into settlement agreement
    - "Utility Air Toxics Study" to Congress completed by Nov. 1995
    - EPA to determine:
      - Whether it is "appropriate and necessary" to regulate power plants under CAA Section 112
      - If so, to issue regulations by 11/15/00
    - Deadline later extended to Feb. 1998

HAP History for Power Plants (cont.)

- February 1998
  - EPA sends "Utility Air Toxics Study" to Congress
- November 1998
  - Deadline extended until 12/15/00
  - EPA agrees to:
    - Issue proposed Hg standards by 12/15/03 and
    - Issue final Hg standards by 12/15/04

HAP History for Power Plants (cont.)

- December 2000
  - EPA announces finding that it was "appropriate and necessary" to regulate electric utilities under Section 112.
- Until standard set by EPA new power plants regulated under Section 112(g) of the CAA (Case-by-Case MACT)

HAP History for Power Plants (cont.)

- June 2003
  - MidAmerican (Council Bluffs, IA)
    - 1st new power plant with Hg limit
    - Limits for other toxic emissions besides Hg:
      - Hydrogen chloride (HCl)
      - Total Selected Metals (TSM)
        - Combination of arsenic, beryllium, cadmium, chromium, lead, manganese, nickel, and selenium
      - Filterable particulate matter
      - Carbon monoxide

HAP History for Power Plants (cont.)

- January 30, 2004
  - EPA proposed 2 approaches for Hg
    - Require plants to meet emission standards reflecting Maximum Achievable Control Technology (MACT)
    - Market based "cap and trade" program
  - EPA also proposed to revise its December 2000 finding that it is "appropriate and necessary" to regulate utility HAP emissions under 112.

HAP History for Power Plants (cont.)

- Public comment period
- March 15, 2005
  - EPA issued Clean Air Mercury Rule (CAMR)
  - Established "standards of performance" (i.e. NSPS) limiting Hg from new and existing utilities
  - Created market based "cap and trade" program

HAP History for Power Plants (cont.)

- May 2005
  - 2 petitions for reconsideration
- June 2005
  - EPA initiates reconsideration
- October 2005
  - EPA reopens public comment period
- May 2006
  - Final rule issued on May 31, 2006

HAP History for Power Plants (cont.)

- Lawsuit
  - State of New Jersey and petitioners filed
- United State Court of Appeals for the District of Columbia
  - Decided February 8, 2008
  - Court vacated
    - Mercury NSPS
    - CAMR

HAP History for Power Plants (cont.)

- EPA and an intervener has requested rehearing
- Ruling still stands
- State has required IPL to submit a Case-by-Case analysis under Section 112 of CAA

PSD Modeling Overview

- PSD Modeling Requirements and Guidance
- Modeling Protocol
- Air Quality Analysis
  - Preliminary Analysis
  - Full Impact Analysis
- Pre-construction Monitoring
- Additional Impacts Analysis
- Class I Impact Analysis

PSD Modeling Requirements and Guidance

- Code of Federal Regulations
  - 40 CFR 51.166 and 52.21
  - General Provisions/Requirements of State Implementation Plans
- EPA's "New Source Review Workshop Manual"
- EPA memorandums and guidance
- Iowa Administration Code
  - 567 IAC Chapter 33
- DNR's "Air Dispersion Modeling Guidelines for PSD Projects"

Modeling Protocol

- Required prior to the pre-application meeting
  - Establishes a common understanding
  - DNR evaluates acceptability of proposed analyses
  - Resolves issues before extensive modeling
  - Decrease chance of errors and inadvertent exclusion of required information
  - Living document

Some Easily Confused Terms

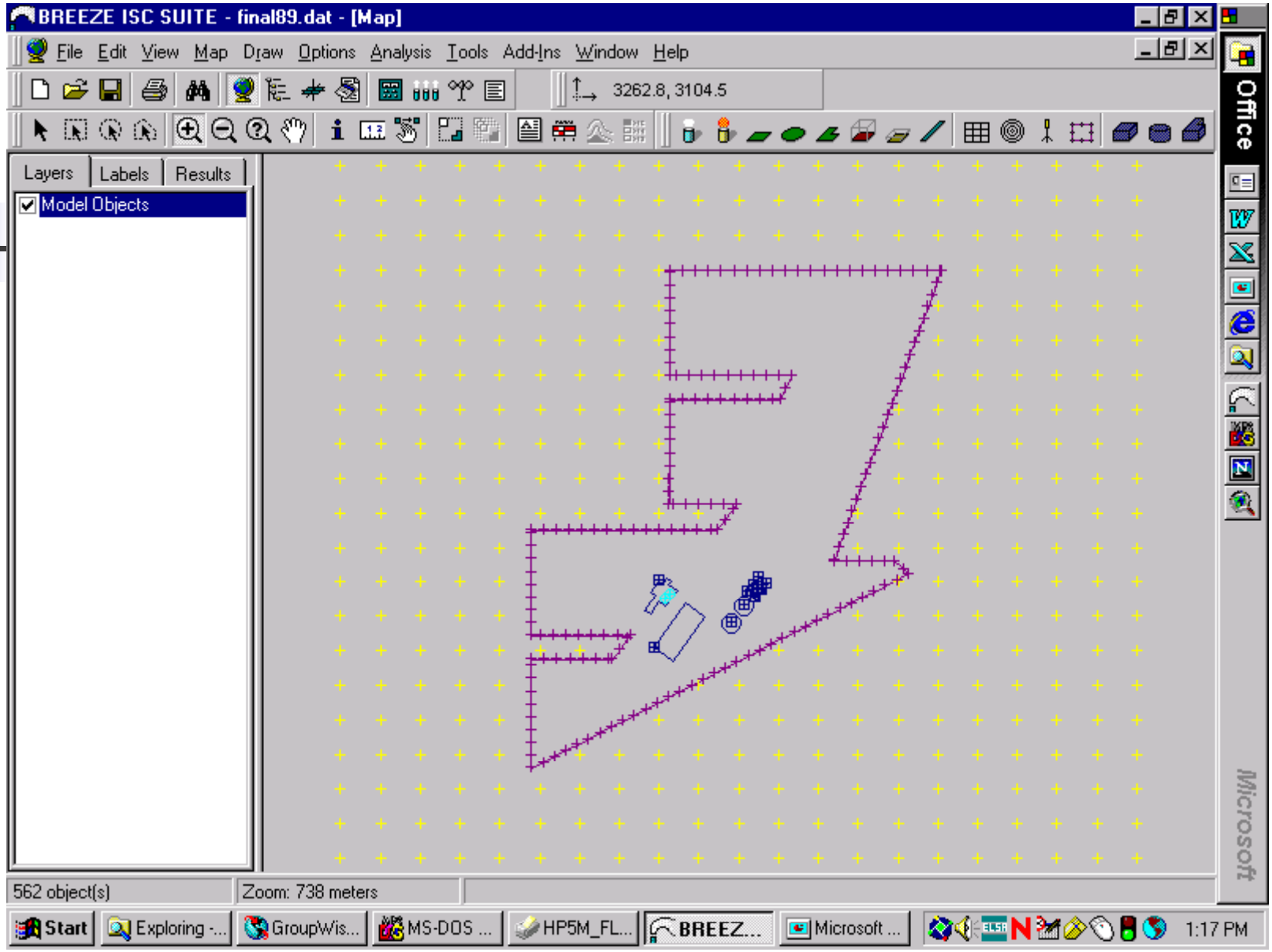
- Significant emission rates
  - emission rates used to trigger modeling review
- Significant impact levels
  - modeled impact levels from the project used to trigger a full impact analysis
- Significant monitoring concentrations
  - modeled impacts used to trigger requirement for ambient monitoring

Air Quality Analysis

- What is dispersion modeling?
  - Primary tool for predicting ground level pollutant concentrations
  - Allows impacts to be determined prior to a source being built or modified
  - Is not restricted to the spatial and temporal limitations of an ambient monitor

Air Quality Analysis

- Requirements for dispersion modeling:
  - Source data
    - Emission rates
    - Source parameters
  - Facility site plan
  - Terrain data
  - Hourly meteorological data
  - EPA regulatory model (AERMOD)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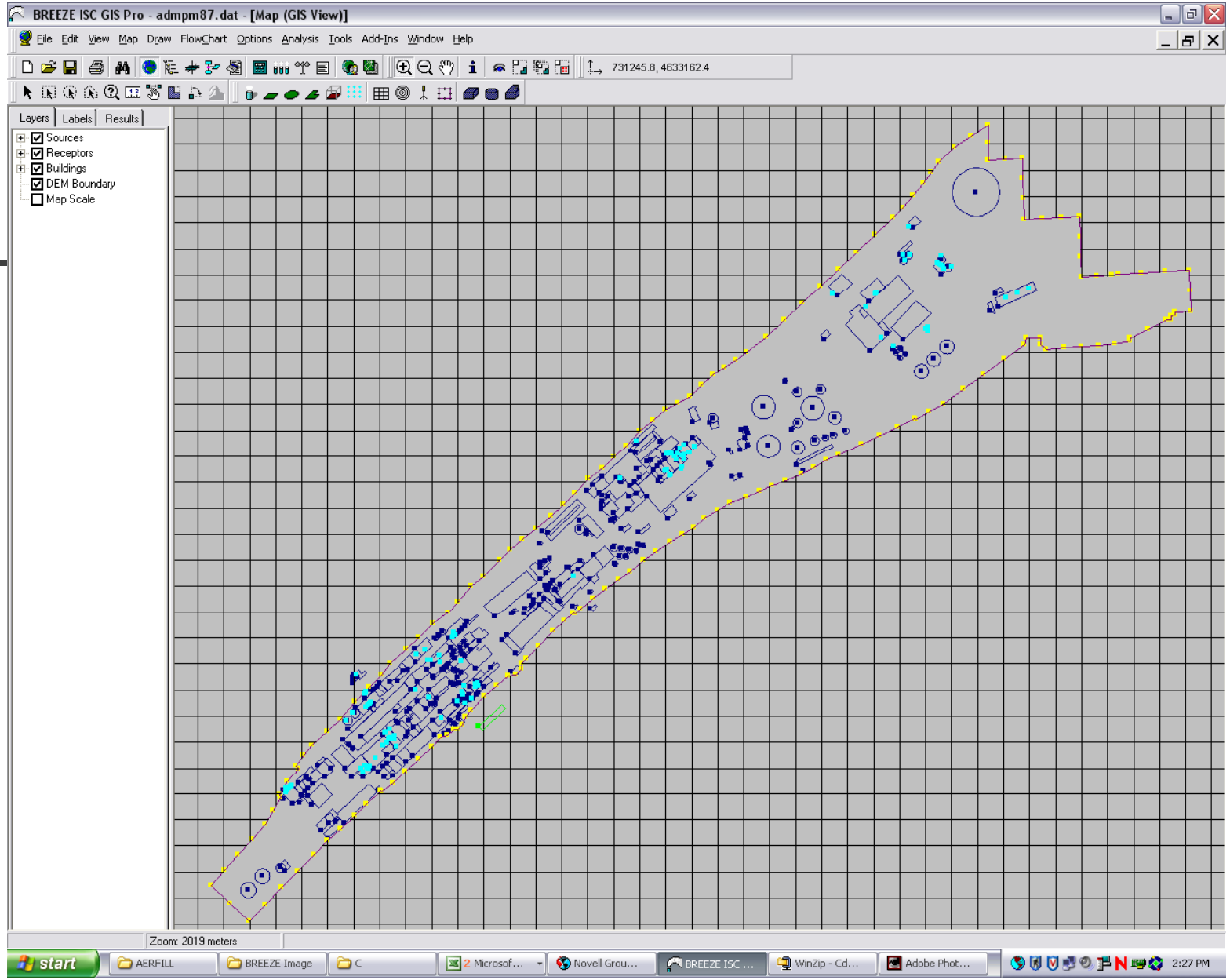
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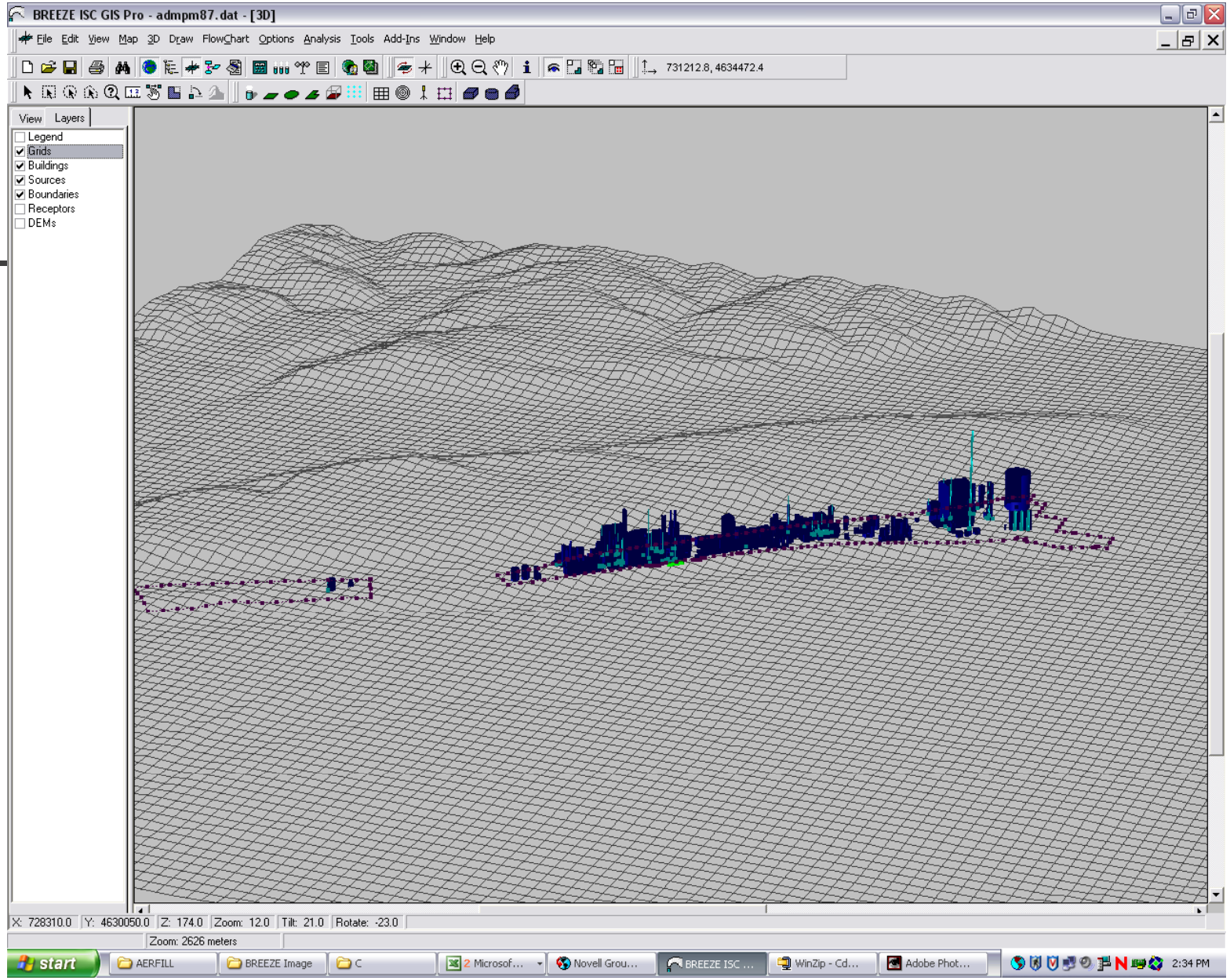
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Air Quality Analysis

- When is a PSD project modeled?
  - Project meets applicability determination for PSD
  - Potential increase in emissions from the project or net increase in emissions from the modification are higher than the significant emission rates
  - DNR may require non-PSD modeling in areas of concern

Significant Emission Rates for Criteria Pollutants

Pollutant	Emission Rate (ton/year)
PM/PM_{10}	25/15
SO_2	40
NO_X	40
CO	100
Ozone (VOC)	40
Lead	0.6

Air Quality Analysis

- Preliminary Analysis
  - evaluates the potential increase in emissions from the project or the net increase in emissions associated with a modification

Air Quality Analysis

- Predicted pollutant concentrations are given in terms of an amount of pollutant per volume of air ($\mu g/m^3$)

- Results from the preliminary modeling are compared to the significant impact levels

Significant Impact Levels

Pollutant	Averaging Period	SIL ($\mu g/m^3$)
PM10	Annual	1
	24-hour	5
SO2	Annual	1
	24-hour	5
	3-hour	25
NOx	Annual	1
CO	8-hour	500
	1-hour	2,000

Air Quality Analysis

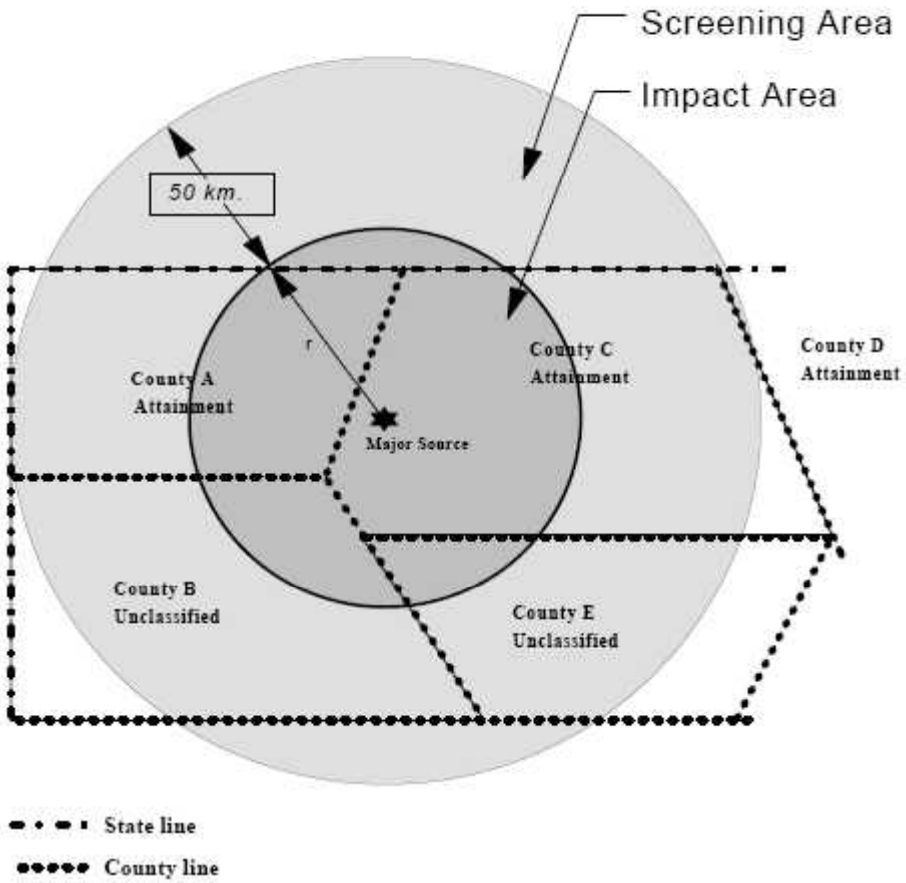
- Preliminary modeling
  - Determines whether the applicant can forego additional modeling for a pollutant (full impact analysis)
  - May allow the applicant to be exempt from pre-construction ambient monitoring requirements
  - Defines the impact area for the full impact analysis

Air Quality Analysis

- Full Impact Analysis
  - Includes emissions from the project, existing emissions at the facility, and any nearby facilities
  - National Ambient Air Quality Standards (NAAQS) Analysis
  - PSD Increment Analysis (PM_{10}, SO_2, NO_2)

Air Quality Analysis

- Nearby facilities included in the full impact analysis
  - Facilities likely to have a significant impact within the impact area
  - Located in the impact area and the screening area
  - Determined by the DNR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Air Quality Analysis

- NAAQS Analysis
  - All sources evaluated at potential emission rates
  - Modeling results plus background values must be below the NAAQS
  - Background values are determined from monitoring data and account for:
    - Natural sources
    - Nearby facilities not in the model
    - Unidentified sources

NAAQS

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$)
PM_{10}	Annual	50
	24-hour	150
SO_2	Annual	80
	24-hour	365
	3-hour	1300
NO_2	Annual	100
CO	8-hour	10,000
	1-hour	40,000
Lead	3 month	1.5

Air Quality Analysis

- PSD Increment Analysis (PM_{10}, SO_2, NO_2)
  - Maximum allowable increase in pollutant concentration that can occur above the applicable baseline concentration
  - Baseline concentration is the ambient concentration at the time the first complete PSD permit application affecting the area was submitted
  - All of Iowa is considered to be Class II (normal well-balanced industrial use)

Class II PSD Increment

Pollutant	Averaging Period	PSD Increment ($\mu g/m^3$)
PM_{10}	Annual	17
	24-hour	30
SO_2	Annual	20
	24-hour	91
	3-hour	512
NO_2	Annual	25

Air Quality Analysis

- PSD increment evaluates
  - Actual emission increases (or decreases) after the Major Source Baseline Date that are associated with construction at a major source
  - Actual emission increases (or decreases) at <u>any</u> stationary source after the Minor Source Baseline Date

Baseline Dates for Iowa

Pollutant	Major Source Baseline Date	Minor Source Baseline Date
PM_{10}	January 6, 1975	Varies by location
SO_2	January 6, 1975	September 6, 1978
NO_2	February 8, 1988	March 14, 1988

Pre-construction Monitoring

- One year of pre-construction monitoring may be required for criteria pollutant being emitted over the significant emission rate
- May be exempt if either:
  - Predicted impact from project is below the significant monitoring concentration
  - Existing ambient pollutant concentrations are below the significant monitoring concentration

Significant Monitoring Concentrations

Pollutant	Averaging Period	Concentration ($\mu g/m^3$)
PM_{10}	24-hour	10
SO_2	24-hour	13
NO_2	Annual	14
CO	8-hour	575
Lead	3 month	0.3

Pre-construction Monitoring

- Requirement to conduct pre-construction monitoring can be met in two ways:
  - Existing ambient data may be used if the DNR determines that the data is representative
  - Establish a site-specific monitoring network

Pre-construction Monitoring

- If the facility proposes to be exempt from pre-construction monitoring due to modeled impacts below the significant monitoring concentrations, review is conducted by the modeling group.

- If the facility cannot exempt out of the pre-construction monitoring requirement, use of existing monitoring data should be discussed with the construction permit engineer and the monitoring staff.

Additional Impacts Analysis

- Growth
- Ambient Air Quality Impact Analysis
- Soils and Vegetation Impacts
- Visibility Impairment

Additional Impacts Analysis

- Purpose of the additional impact analysis:
  - Present a clear and accurate portrait of the air quality impacts that a proposed source may have on growth, soils and vegetation, and visibility
  - Provide adequate documentation of impacts
  - Present data so that it is logical and understandable to the community and general public

Additional Impacts Analysis

- Growth Analysis
  - Projection of associated industrial, commercial, and residential growth that will occur in the area due to the project
  - Estimation of the emissions resulting form this growth

Additional Impact Analysis

- Ambient Air Quality Analysis
  - Modeling analysis of:
    - Emissions estimated from associated growth
    - Emissions from the project
    - Emissions from other sources that have been permitted but not yet in operation
  - Often emissions from associated growth are negligible and no additional modeling is required

Additional Impact Analysis

- Soils and Vegetation Analysis
  - Based on an inventory of soils and vegetation types found in the impact area
    - Includes all vegetation with any commercial or recreational value
  - Determine the sensitivity of soils and vegetation to each pollutant emitted in a significant amount
  - Compare sensitivity levels to the modeled impacts

Additional Impact Analysis

- Soils and Vegetation Analysis
  - For most soils and vegetation, pollutant concentrations below the NAAQS will not result in harmful effects
  - Sensitive vegetation may require a more careful evaluation

Additional Impact Analysis

- Visibility Impairment Analysis
  - Primarily concerned with visibility within the significant impact area
  - Locations to evaluate are determined by the DNR
    - State parks
    - Wilderness areas
    - Airports
    - Scenic overlooks

Additional Impact Analysis

- Visibility Impairment Analysis
  - Includes:
    - Determination of visual quality of the area
    - Initial screening of project emissions to assess possibility of visibility impairment (VISCREEN)
    - If warranted, a more in depth analysis involving computer modeling
  - EPA's "Workbook for Plume Visual Impact Screening and Analysis (Revised)" 1992

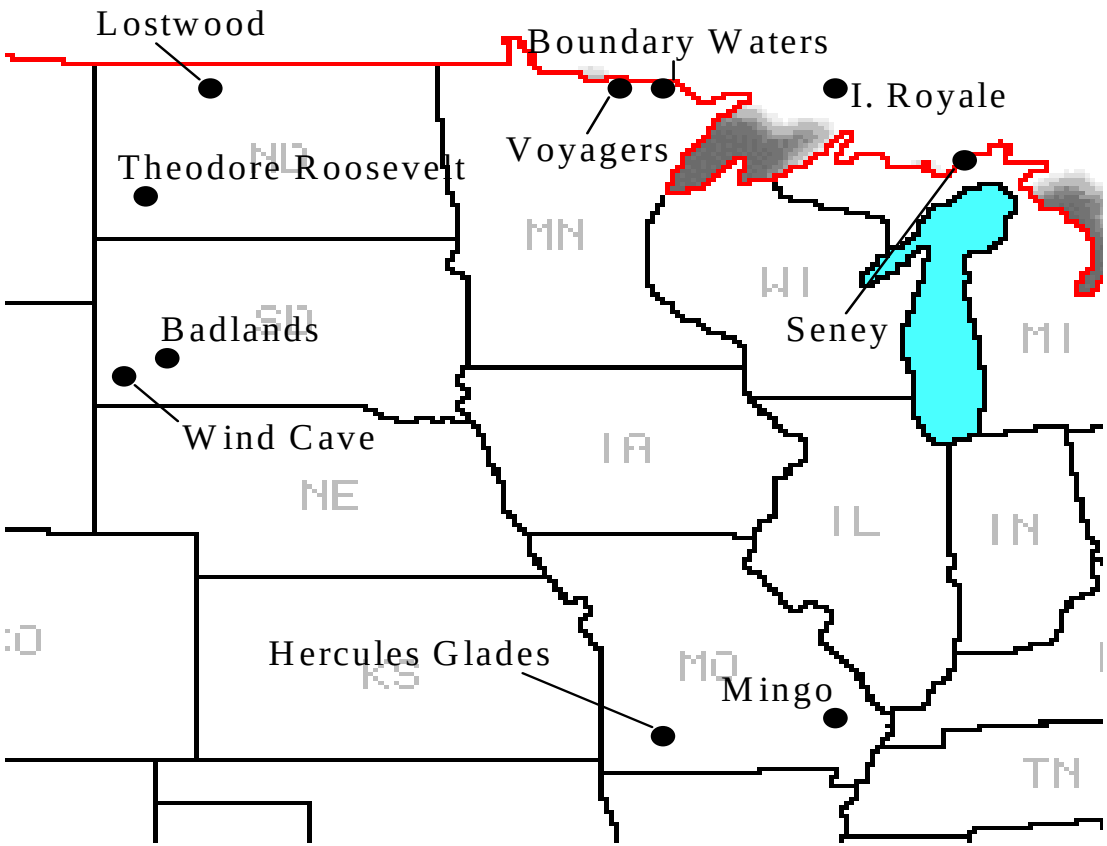
Class I Impact Analysis

- Class I Areas are areas of special national or recreational value from a natural, scenic, recreational, or historic perspective
- Congress established mandatory Class I Areas
- Allow for the smallest amount of deterioration

Class I Impact Analysis

- DNR
  - has the responsibility to notify the federal land manager (FLM) of any PSD project locating within 100 Km of a Class I Area, or greater than 100 Km if the project is large enough
- FLM's
  - have the responsibility to protect the air quality related values (AQRVs) such as flora and fauna, water, visibility, archeology, and odor in the Class I Areas
- Currently there are no Class I Areas located within 100 Km of Iowa's borders

Class I Areas near Iowa



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Public Comment Period

- Purpose
  - Allow review of application materials by public
  - Allow for comments on draft permits as related to air quality issues
- Public Notice
  - Public and all interested parties notified
  - Published in newspaper (legal section of paper)
    - Des Moines Register
    - Times-Republican

Public Comment Period (cont.)

- Draft permits, technical support document, and copy of all application materials sent to local library prior to start of comment period
- Draft permits & technical support document sent to:
  - EPA
  - Company
  - Air Quality website
    - http://aq48.dnraq.state.ia.us:8080/airpermit/eecomment.jsp
    - 30 days in length
- All comments accepted & reviewed

Public Hearing

- Usually scheduled for 2 hours
- Purpose
  - Opportunity for oral comments
  - Written comments can also be submitted
  - Not for answering questions
- Usually towards end of comment period
- Date & time listed in notice

After Public Comment Period

- Department reviews and prepares responses to all comments
- Copies of responses sent to all those that commented
- Final permits issued considering comments or,
- Draft permits need amendments based on comments, then…
  - Possibly another public comment period
  - Permits finalized

Contacts

- Construction permitting questions
  - Chris Roling
    - chris.roling@dnr.iowa.gov
    - (515) 242-6002
- Dispersion modeling questions
  - Lori Hanson
    - lori.hanson@dnr.iowa.gov
    - (515) 281-8911
- Non Air Quality questions
  - Christine Spackman
    - christine.spackman@dnr.iowa.gov
    - (515) 281-7276

Useful Websites

- Iowa DNR
  - http://www.iowadnr.gov/index.html
- Iowa Air Quality Bureau
  - http://www.iowacleanair.com/

Useful Websites (cont.)

- EPA (General website)
  - http://www.epa.gov/
- EPA (Air)
  - http://www.epa.gov/ebtpages/air.html
- EPA (New Source Review)
  - http://www.epa.gov/nsr/
- EPA (Air Toxics
  - http://www.epa.gov/ttn/atw/index.html

Questions?