Case Development: Tools and Techniques
Case Development

- Targeting
- Information Gathering
- Emissions Calculations
Purpose

- Identify tools and techniques that can be used in NSR Case development and permitting:
  - Targeting: Understanding trends in the industry and specific processes more completely
  - Information Gathering: Identifying the full scope, effect and purpose of the project being permitted
  - Emissions Calculations: Questioning and checking baseline actual and projected actual emissions
Targeting Importance

- Targeting is important for enforcement because focusing on a sector and conducting in-depth investigations are time-consuming commitments.

- Limited resources within EPA require that we use our time most effectively and target inspections where violations are more likely.
Industries that have grown are more likely to have triggered CAA requirements than those industries that have not grown

- NSR
- NSPS
- MACT

NSR permitting is sometimes scant in industries where there has been significant growth
Emissions are often related to production

- Increased production often causes increased emissions from existing facilities and sources
  - Unless contemporaneous or concurrent emissions reductions are accomplished

- Increased production is normally achieved by construction of new facilities and sources or modification of existing facilities and sources
Increased production capacity indicates physical construction

- Increased production of existing lines
- New production lines
Link between CAA Requirements and Physical Construction

- Physical construction generally involves “a physical change” that may trigger new requirements of NSR or NSPS
Systematic Targeting of Industry Sectors

- Choose a high emitting sector
  - National Emission Inventories and TRI to identify can indicate a sector that is a high emitter nationally or for your region
  - Utilities, Petroleum Refineries, Pulp & Paper, Cement and Glass are all significant emitters of SO2 and NOx in the NEI
Systematic Targeting of Industry Sectors

- Identify a Sector with increases in capacity without corresponding permitting
  - Information on industry production capacity is publicly available
  - Research permit activity for the industry
Systematic Targeting of Industry Sectors

- Have a Case Theory and Test it
  - FCCU capacity expansion through increases in air blower capacity results in increased emissions of SO2, NOx and PM
  - Reclaiming lost capacity on a utility boiler results in increased emissions of SO2, NOx, and PM
  - Increase in pulping capacity results in increase SO2 from NCG incineration
  - Physical changes necessary to burn petroleum coke in cement kilns have resulted in increased emissions of SO2
  - Installing electric boost on glass furnaces can increase PM emissions
Systematic Targeting of Industry Sectors

- Keep the End Game in Mind
  - What benefits will result from application of injunctive relief?
  - Common existing controls in industry vs. availability of more effective controls
    - Do most sources avoid application of BACT/LAER by netting out or by questionable BACT/LAER determinations?
    - Is NSPS widely avoided in industry?
Examine Data over Time

- Identify an industry that has expanded significantly
- Gather data on capacity or production changes over time
- Plot data to highlight trends visually
- Read supporting information on forecasts of trends for the industry
U.S. Refining Capacity per Refinery

Capacity per Refinery (BPD)

Barrels per Calendar Day

- 1985 - 80,000
- 1986 - 85,000
- 1987 - 90,000
- 1988 - 95,000
- 1989 - 100,000
- 1990 - 105,000
- 1991 - 110,000
- 1992 - 115,000
- 1993 - 120,000
- 1994 - 125,000
- 1995 - 130,000
- 1996 - 135,000
- 1997 - 140,000
Systematic Targeting of Specific Facilities

- Use research to identify facilities that have expanded production capacity significantly without obtaining PSD or NSR permits
- Look for facility capacity data over time, summaries of construction projects at particular facilities, and compare
Crude Unit Capacity

Texaco - Anacortes, WA

Unit Capacity in BPD

Year


Crude Unit
Vacuum Distillation Unit
Other Clues for Targeting

- Look for companies that have had similar problems/violations in several facilities
- Look for companies that have had similar problems/violations in different parts of the country
- Look for similar changes among several companies in an industry sector
  - Process improvements that spread through industry that increase emissions (e.g., Ladle Metallurgy Station on an Electric Arc Furnace)
  - Cost savings measures that are adopted by the industry as a whole that increase emissions
Research Resources

- Industry journals
- Industry directories
EPA databases showing changes over time in pollutant emissions, discharges, releases

- AFS - Airs Facility Subsystem
- NEI - National Emission Inventory
- TRIS - Toxic Release Inventory System
- PCS - Permit Compliance System
Research Resources (continued)

- **Internet**
  - Facility and corporate home pages
    - www.name.com
    - annual reports
    - facility and corporate news
  - Industry publishers
    - www.pulp-paper.com
    - www.chemicalweek.com
    - use to identify other sources of information
Research Resources (continued)

- Lexis/Nexis™ for facility information
- Contacts in states
  - inspectors
  - permit writers
  - enforcement personnel
Information Gathering

- File Review
- Facility Inspection
- Information Requests
File Review

- Permit Applications and Correspondence
- Engineering Evaluations
- BACT Analyses
- Minor and Major NSR Permits
- Emission Inventories
- Inspection Reports
File Review

- Just as important for permitting to understand the facility history as it is when conducting an NSR investigation
  - Relationship between separate permit applications (are they one project permitted separately?)
  - Relaxation of synthetic minor permit limit might trigger 52.21(r) and will not be known unless origin of limit is known
Facility Inspection

- Interviews
- Physical evidence
- Records
Facility Inspection: Interviews

- Talk to Engineer responsible for process
  - detailed description of process
    - reference process flow diagrams
  - Focus on changes in operations or equipment
    - reference Authorizations for Expenditure and engineering studies

- Talk to Operators
Facility Inspection: Physical Evidence

- Physical signs of new construction
- Changes in control equipment or technology
- Photographs (Google Maps)
- Samples and monitoring
Facility Inspection: Facility Records

- Records that indicate modifications
  - Authorizations for Expenditure
  - Engineering Studies
  - Turnaround Reports
  - Capital Forecasts and other planning documents
Facility Inspection: Facility Records (continued)

- Production records
- Records of raw materials usage/supplier
- Records of process parameters
- Control equipment O&M logs
- Operator logs
- Calculation of actual emissions
- Results of stack tests and test methods
- CEMS Data
Meeting in Lieu of Onsite Inspection

- Understanding the process is key to proper permitting
- In lieu of an onsite inspection (sometimes difficult due to travel budget limitations), the permitter may ask that the company come in and provide a presentation explaining how the processes work
Ask for:

- Generally, evidence for changes that may have increased production capacity
- Information needed to calculate emissions independently
- Permit history
Information Requests: Capacity Increase Evidence

- **Documents**
  - Authorizations for Expenditure
  - Engineering Studies
  - Turnaround Reports

- **Data over time**
  - Feed/Production – plot it
  - Fuel Usage – plot it
Information Requests: Emissions Calculations

- Feed/Production/Fuel usage over time
- CEMS data over time
- All Stack Tests for Unit in Question
- Annual Emission Statements
- Calculations of projected actual emissions
- Require testing (if necessary)
Information Requests: Permit History

- All permit applications and supporting correspondence
- Engineering or permit review memoranda
- All permits
  - Minor NSR
  - Major NSR
  - Title V
Emissions Calculations

- Explain the various sources of data available for use in emissions calculations
  - A Data Quality List
Data Quality Hierarchy

1. CEMs data from emission point(s) in question
2. Representative source test data from emission point(s) in question
3. AP-42 emission factors
4. Industry-derived and vendor guaranteed manufacturer emission factors
CEMs Data

- Best data
- If data available from before and after change, data can be used to see what actually happened
- Statistical tests can be used to determine significance of the change
Source Tests

- Operating parameters can affect results
- Source can change parameters during tests
- Results can be used to create production-based emission factor
- If data from before and after change available; results can be used to look at actual-to-actual emissions
- Know why test was done: worst case vs. representative
AP-42 Emission Factors

- Is an estimated average and range
- Factors have a range of reliability
- If emission factor used prior to change involving new equipment, should consider requiring source test
Predictive Emissions Monitoring Systems

- Predicts emissions by analysis of process parameters through a statistical or neural net model after training model with a CEMS
- Can be useful when no CEMS data available, however, there are drawbacks:
  - Can only produce meaningful data for a range of process inputs that occurred during the training set; and
  - If violations did not occur during training set, PEMS may not produce a meaningful number when violations occur.
- Should avoid replacing CEMS with PEMS where CEMS are already installed or required