Prevention of Significant Deterioration

1

PSD Program Goals

- To ensure that economic growth will occur in harmony with the preservation of existing clean air resources
- To preserve, protect, and enhance the air quality in areas of special natural recreational, scenic, or historic value, such as national parks and wildlife areas
- To protect the public health and welfare from any adverse effect which might occur even at air pollution levels better than the NAAQS

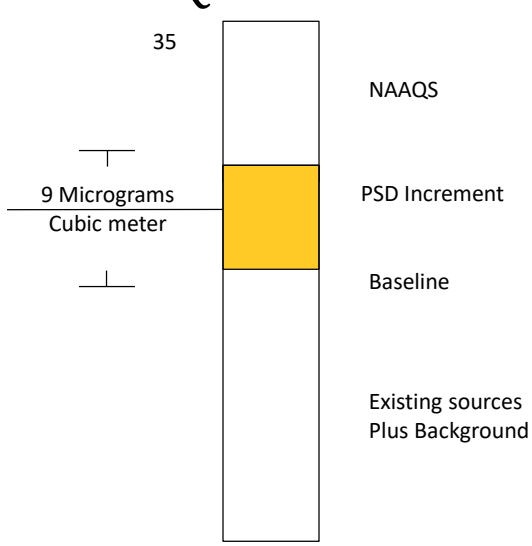
2

PSD Program Goals - Metrics

- Allow economic growth to occur while limiting air quality degradation to "PSD Increments"
  - PSD Increments: Maximum increases in ambient pollutant concentrations allowed over baseline concentrations
  - Baseline concentrations are defined for each pollutant and averaging period

3

Case 1: PSD Increment Limited Area $PM_{2.5}$ 24-hour NAAQS



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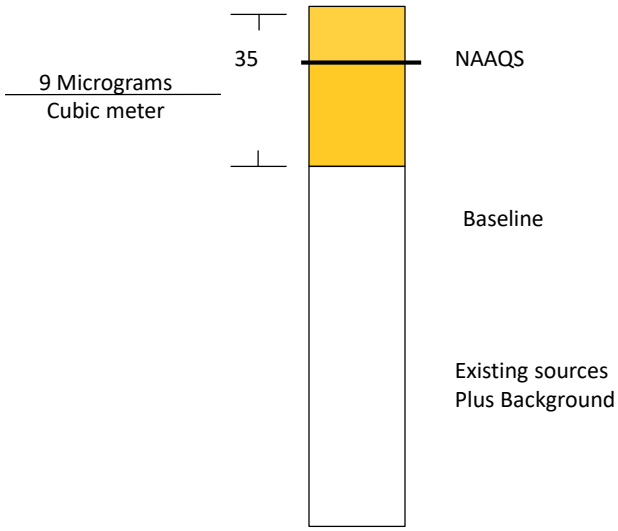
Case 2: NAAQS Limited Area
$PM_{2.5}$ 24-hour NAAQS



5

Achieving Goals of PSD Program

- A source should install modern pollution controls…
  - when it is built (new source)
  - when it makes a major modification (existing source)
    - (i.e., LARGE capital investment [?])
- A source shall demonstrate no adverse impacts on air quality prior to construction
  - Compliance with NAAQS
  - Compliance with PSD Increments
  - No adverse impacts on soils, vegetation, visibility, Class I Areas

6

PSD Applicability Basics

- PSD permitting requirements are triggered by an event
  - Construction of a new major source
  - Major expansion of an existing major source
  - Physical or operational change at an existing major source (i.e. a "project")
- PSD applicability is evaluated on a pollutant-by-pollutant basis

7

PSD Applicability Basics (cont.)

- New Sources
  - PSD is triggered (for a certain pollutant) when potential emissions from new source exceed thresholds that define a major source under the PSD program
- Existing Major Sources
  - PSD is triggered (for a certain pollutant) when net emission increases exceed thresholds that define a major modification

8

Identifying PSD Project Triggers Questions

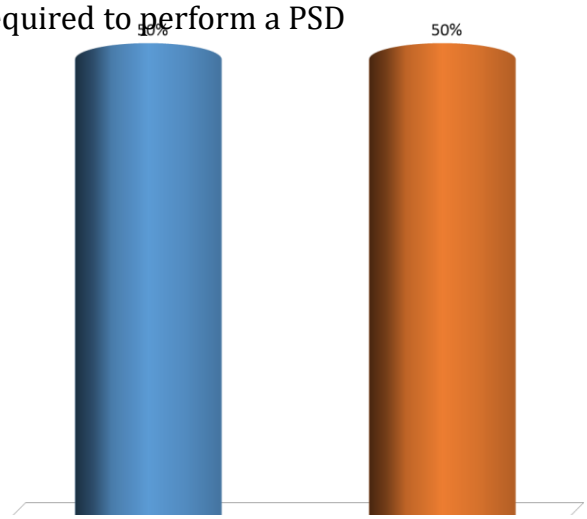
- Existing units
  - Will the project impact any of the following?
    - Design rating (e.g., MW, MMBtu/hr, ton/hr)
    - Availability (e.g., downtime reduction)
    - Fuel or raw material type
    - Amount of usage (i.e., capacity factor)
    - For EGUs, heat rate (i.e., efficiency)
  - Could the project be considered reconstruction? (uncommon)
- New units

9

A facility is a PSD major source and permitted to operate a batch reactor for 200 batches annually. Currently, the batch reactor only operates for 50 batches annually. The permittee considers installing a new catalyst that will make operating more cost efficient. After installing the catalyst, the reactor is still expected to operate for only 100 batches annually. The emissions per batch will remain the same. Is the facility required to perform a PSD applicability analysis?

✔ A. Yes

B. No



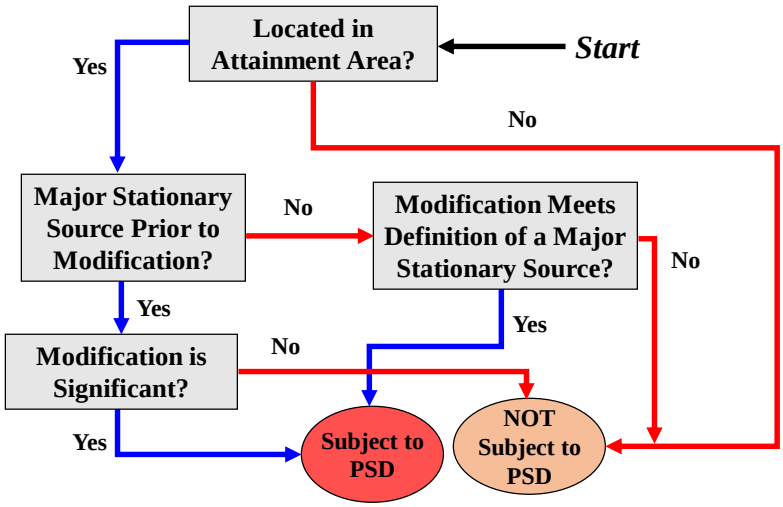
10

PSD Triggering Thresholds

- New Sources: Plant will be a major source
  (Potential emissions exceed the major source threshold of 100 or 250 tons/year)
- Existing Minor Sources: Make a modification that in itself is "major"
  (Potential emissions of project alone exceed major source threshold of 100 or 250 tons/year)
- Existing Major Sources: Make a modification that exceeds *de minimis* levels (also called PSD Significant Emission Rates); a "major modification"
  Existing major sources may "net-out" of PSD review

11

Is a Project Subject to PSD?



12

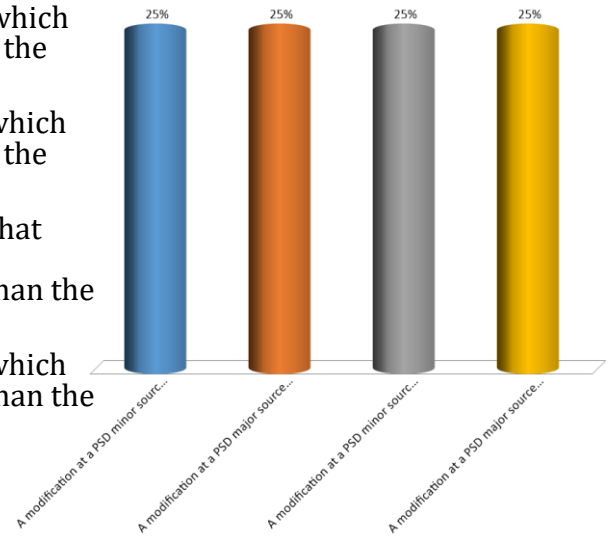
Which of the following projects would be subject to PSD permitting?

A. A modification at a PSD minor source which causes an emissions increase less than the significant emissions rate.

B. A modification at a PSD major source which causes an emissions increase less than the significant emissions rate.

C. A modification at a PSD minor source that will stay minor after the project, which causes an emissions increase greater than the significant emissions rate.

✓ D. A modification at a PSD major source which causes an emissions increase greater than the significant emissions rate.



13

Potential to Emit (PTE)

The maximum capacity of an emission unit or facility to emit a pollutant under its physical and operational design.

- Any physical or operational limitation on the capacity of the emissions unit or facility to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.
- Secondary emissions do not count in determining the potential to emit of an emission unit or facility.

[Rule 62-210.200(201), F.A.C.]

14

Potential to Emit (PTE)

- One of several ways to categorize how much a source emits
- PTE is the maximum capacity to emit
- PTE may be limited by:
  - Physical and operational limits
  - Air pollution control equipment
  - Restricted hours of operation
  - Type or amount of material combusted, stored, or processed
- Limitations must be enforceable

15

Actual Emissions

- Actual emissions are the emissions a source actually emits
- Based on:
  - Actual operation
  - Actual emission rates
    - Measurements/analysis (stack test, CEMS)
    - Material balance
  - Actual production
  - Includes control equipment

16

Emission Calculations

- Determining potential and/or actual emissions can be determined using a variety of resources:
  - Stack testing
  - Continuous emissions monitoring (CEMS)
  - Mass balance calculations
  - EPA AP-42 emission factors
  - EPA FIRE factors
  - Manufacturer specification sheets
  - Material safety data sheets (MSDS)

- Actual test results or CEMS are more accurate than default factors.

17

Potential to Emit
Example – Natural Gas Fired Heater

- Specifications
  - Fires natural gas
  - Maximum design heat input rating of 25 MMBtu/hr
- Boiler operating and test data
  - NOx from stack testing measured at 50 lb/MMscf
  - Boiler consumed 1 million therms of natural gas in 2012
- Permit conditions
  - Boiler is subject to a NOx emission standard of 100 lb/MMscf
  - No other restrictions on operations

18

Potential to Emit
Example – Natural Gas Fired Heater

- Does actual fuel usage (utilization) or true emission factor matter?
- Does actual uptime operating hours matter?
- Do you have to consider emissions from other fuels?

19

Potential to Emit
Example – Steam Boiler

- Actual NOx emissions for 2012 CY:

$$\left(\frac{1\,\text{MM therms}}{\text{yr}}\right)\left(\frac{\text{MMscf}}{10{,}200\,\text{therms}}\right)\left(\frac{50\,\text{lb}}{\text{MMscf}}\right)\left(\frac{\text{ton}}{2{,}000\,\text{lb}}\right)=2.45\,\text{tpy}$$

- Potential to Emit for NOx:

$$\left(\frac{25\,\text{MMBtu}}{\text{hr}}\right)\left(\frac{100\,\text{lb}}{\text{MMscf}}\right)\left(\frac{\text{MMscf}}{1020\,\text{MMBtu}}\right)$$

$$\left(\frac{8{,}760\,\text{hr}}{\text{yr}}\right)\left(\frac{\text{ton}}{2{,}000\,\text{lb}}\right)=10.74\,\text{tpy}$$

20

Potential to Emit
Example – Baghouse grain loading

Used to determine particulate matter emissions from dust collectors

- Dust collector Air Flow Rate = 3,000 scfm
- Fabric filter grain loading factor = 0.02 gr/scfm

$$\left(\frac{3{,}000\ \text{scf}}{\text{min}}\right)\left(\frac{0.02\ \text{gr}}{\text{scf}}\right)\left(\frac{60\ \text{min}}{\text{hr}}\right)\left(\frac{1\ \text{lb}}{7{,}000\ \text{gr}}\right)=\left(\frac{0.51\ \text{lb}}{\text{hr}}\right)$$

21

Potential to Emit Example -
Fugitive PM from Abrasive Blasting of Metal Parts

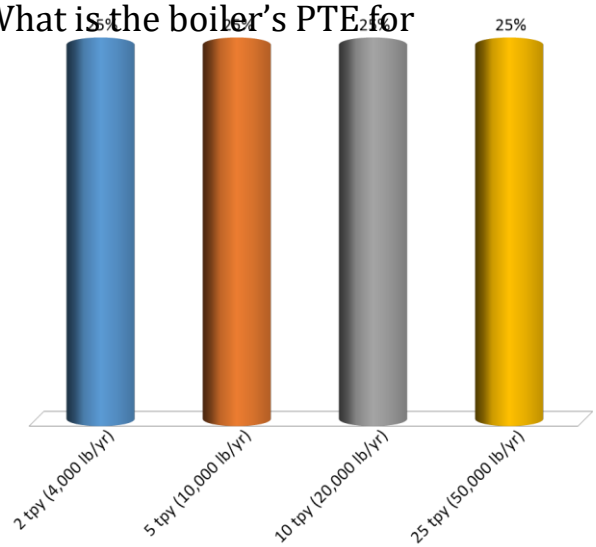
- EPA AP-42 Abrasive Cutting/Blasting (Section 13.2.6)
- Table 13.2.6-1: Abrasive blasting of unspecified metal parts, controlled with a fabric filter = 0.69 lb/1,000 lb abrasive
- Usage of 34,000,000 lbs of abrasive/year

$$\left(\frac{34{,}000{,}000\ \text{lb abrasive}}{\text{yr}}\right)\left(\frac{0.69\ \text{lb PM}}{1{,}000\ \text{lb abrasive}}\right)=\left(\frac{23{,}460\ \text{lb PM}}{\text{yr}}\right)$$

22

A boiler is permitted to combust 1,000 MMscf annually and has an emissions limit of 50 lb NO_X/MMscf. However, the boiler actually combusts only 200 MMscf annually and stack test results show the boiler emits only 20 lb NO_X/MMscf. What is the boiler's PTE for NO_X?

A. 2 tpy (4,000 lb/yr)
B. 5 tpy (10,000 lb/yr)
C. 10 tpy (20,000 lb/yr)
✓ D. 25 tpy (50,000 lb/yr)



23

PSD Pollutants

- CO, NO_X, SO_2, $PM_{2.5\&10}$
- TSP
- VOC
- Lead
- Hydrogen sulfide (H_2S)
- Total reduced sulfur (including H_2S)
- Reduced sulfur compounds (including H_2S)
- Sulfuric Acid Mist

* Per Rule 62-210.200(210), F.A.C., any pollutant with an SER or "regulated" per 40 CFR 52.21(b)(5)

24

PSD Pollutants

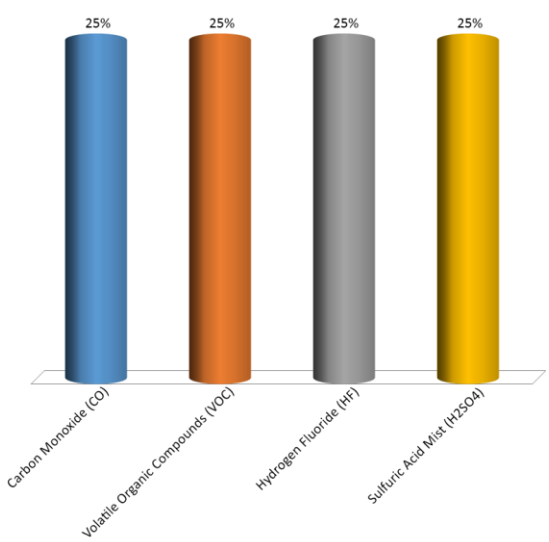
- Fluorides
- Municipal waste combustor acid gases, metals, and organics
- Municipal solid waste landfill emissions
- Greenhouse Gases – CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 – "subject to regulation" scenarios

* Mercury is a "PSD Pollutant" in Florida, with an SER of 0.1 tpy.

25

Which of the following pollutants are not regulated under PSD?

A. Carbon Monoxide (CO)
B. Volatile Organic Compounds (VOC)
✓ C. Hydrogen Fluoride (HF)
D. Sulfuric Acid Mist (H_2SO_4)



26

Significant Emissions Rates

Pollutant	SER
Carbon monoxide	100 tpy
Nitrogen oxides	40 tpy
Sulfur dioxide	40 tpy
Particulate matter	25 tpy
PM_{10}	15 tpy
$PM_{2.5}$	10 tpy of direct $PM_{2.5}$
Ozone	40 tpy of VOC or NO_X
Lead	0.6 tpy
Fluorides	3 tpy
Sulfuric acid mist (SAM)	7 tpy
Hydrogen sulfide (H_2S)	10 tpy

27

Significant Emissions Rates

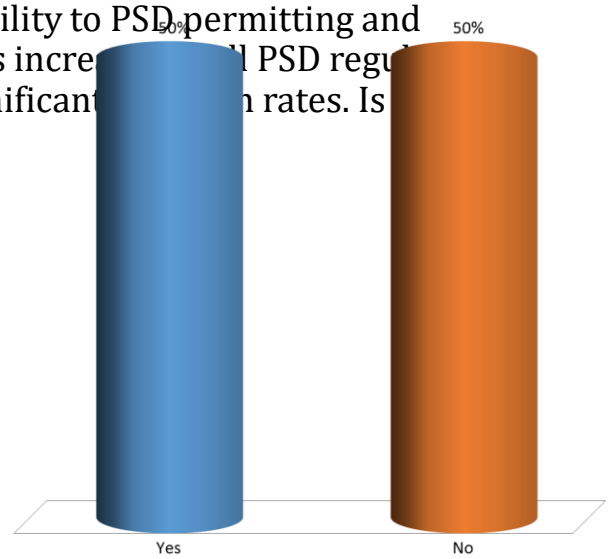
Pollutant	SER
Total reduced sulfur (including H_2S)	10 tpy
Reduced sulfur compounds (including H_2S)	10 tpy
Municipal waste combustor organics (measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans)	3 tpy
Municipal waste combustor metals (measured as particulate matter)	15 tpy
Municipal waste combustor acid gases (measured as sulfur dioxide and hydrogen chloride)	40 tpy

28

A Portland cement plant is subject to a PSD major source threshold of 100 tons per year of emissions of any PSD pollutant. The plant has the potential to emit 1,500 tons of NO_X emissions per year. The plant evaluates a project for applicability to PSD permitting and finds actual (not potential) emissions incre[illegible]l PSD regu[illegible] pollutants will remain below the significant [illegible]n rates. Is [illegible] project subject to PSD permitting?

A. Yes

✓ B. No



29

Does $PM_{2.5}$ Include Condensables?

- Condensables are that portion of the exhaust that passes through the filter in a Method 5 test, but that gets condensed and captured in the cooled sample train used in Method 202 ("back half catch")
- Per the 5/16/2008 final $PM_{2.5}$ implementation rule, condensables (CPM) must be considered in setting emission limits and determining NSR applicability when EPA came up with an acceptable test method:
  - December 21, 2010 - New Method 201A and 202 (Dry Impinger Method) for CPM measurements

30

Condensable Particulate

- October 25, 2012, (77 FR 65107) amendments to Parts 51 and 52 clarify the status of condensable particulate matter (CPM)
- 5/16/2008 $PM_{2.5}$ implementation rule included language that created confusion over when to count CPM. It appeared to imply that CPM is part of PM
  - Clarification:
    - Count CPM as part of $PM_{2.5}$ and PM_{10}
    - Do not count CPM as part of PM/TSP
  - Interim policy clarification for stack tests

31

PSD Pollutant – Some Important Details

- Nitrogen Oxides: For PSD emissions purposes (major source/major modification), "NO_x" is reported as NO_2 (even the stack/vent portion emitted as NO).
- VOC: For PSD emissions purposes (major source/major modification), VOC is reported as the mass sum of the individual regulated organic compounds. (NOT based on an EPA Method 25 or 25A test. See EPA test Method 18 – Gas Chromatography).
- Sulfuric Acid Mist: includes SO_3 and vapor H_2SO_4.
- Direct ozone (O_3) is NOT a regulated NSR Pollutant.
- HAPs (normally excluded as individual compounds) are included if they are considered part of a PSD pollutant (i.e. Benzene is a VOC) and/or the HAP is a PSD pollutant precursor.
- Finally, for PSD purposes, NSPS pollutants <u>exclude</u> named HAPs
  - HF (a HAP) is not included as part of PSD regulated "Fluorides."
  - Reduced sulfur compounds exclude CS_2 and COS.

32

PSD Source Categories

- Major Source –a source of air pollution whose PTE of one or more regulated pollutants exceeds the applicable major source threshold

- Synthetic Minor Source – a source of air pollution that reduces its PTE of regulated pollutants below the applicable major source threshold

- Minor Source – a source whose unrestricted PTE or regulated pollutants is below the applicable major source threshold

33

What is a PSD Major Source?

"**Major Stationary Source**" under 62-210.200(154), F.A.C.

- A major stationary source is:

1. Any stationary sources of air pollutants on the **List of 28** which emits, or has the potential to emit, 100 tons per year or more of any PSD pollutant.
2. Any stationary source which emits, or has the potential to emit, 250 tons per year or more of a PSD pollutant, or
3. Any physical change that would occur at a stationary source not otherwise qualifying as a major stationary source, if the change would constitute a major stationary source by itself.

34

Major Source Thresholds Under PSD

- Two thresholds depending on whether in one of 28 named source categories (these are "hard coded" in the Clean Air Act)
  - On "List of 28" : Major Source if PTE > 100 tpy for at least one regulated pollutant
  - NOT on "List of 28" : Major Source if PTE > 250 tpy for at least one regulated pollutant
- PSD addresses "regulated" pollutants and those "subject to regulation"

35

"Listed Stationary Sources" - 100 tons per year

1. Coal cleaning plants (with thermal dryers)
2. Kraft pulp mills
3. Portland cement plants
4. Primary zinc smelters
5. Iron and steel mills
6. Primary aluminum ore reduction plants
7. Primary copper smelters
8. Municipal incinerators capable of charging > 50 tons of refuse/day
9. Hydrofluoric acid plants
10. Sulfuric acid plants

36

"Listed Stationary Sources" - 100 tons per year

11. Nitric acid plants
12. Petroleum refineries
13. Lime plants
14. Phosphate rock processing plants
15. Coke oven batteries
16. Sulfur recovery plants
17. Carbon black plants (furnace process)
18. Primary lead smelters
19. Fuel conversion plants
20. Sintering plants

37

"Listed Stationary Sources" - 100 tons per year

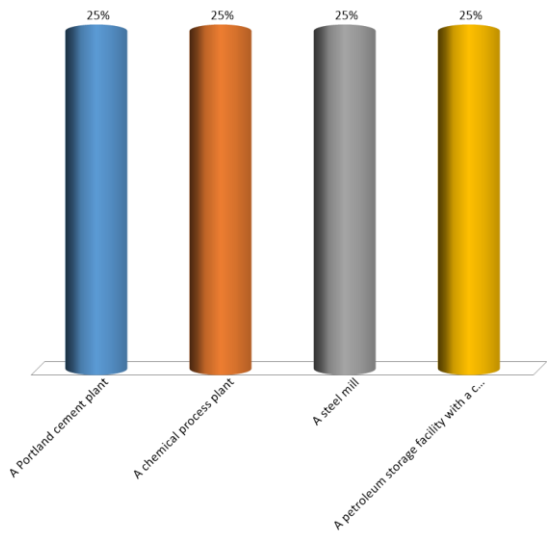
21. Secondary metal production facilities
22. Chemical process plants
23. Fossil-fuel boilers of >250,000,000 Btu per hour heat input
24. Petroleum storage and transfer facilities with a capacity exceeding 300,000 barrels
25. Taconite ore processing facilities
26. Glass fiber processing plants
27. Charcoal production facilities
28. Fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input

Bonus: Any other stationary source category which, as of August 7, 1980, is being regulated under Section 111 or 112 of the CAA (NSPS or NESHAP)

38

Which of the following is subject to a PSD major source threshold of 250 tpy per pollutant?

A. A Portland cement plant
B. A chemical process plant
C. A steel mill
✓ D. A petroleum storage facility with a capacity of 100,000 barrels



39

Fugitive Emissions

Those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. [Rule 62-210.200(118), F.A.C.]

Examples:

- Open product or waste storage piles
- Pumps, flanges, and valves
- Open process or storage tanks
- Haul roads
- Open conveyors

40

Fugitive Emissions - Special Considerations

- Fugitive emissions are <u>not</u> included in determining **major source status** unless the source belongs to one of the source categories:
  - Included on List of 28, or
  - if, as of August 7, 1980, the source category was regulated by an NSPS or NESHAP (Sections 111 or 112 of the CAA)

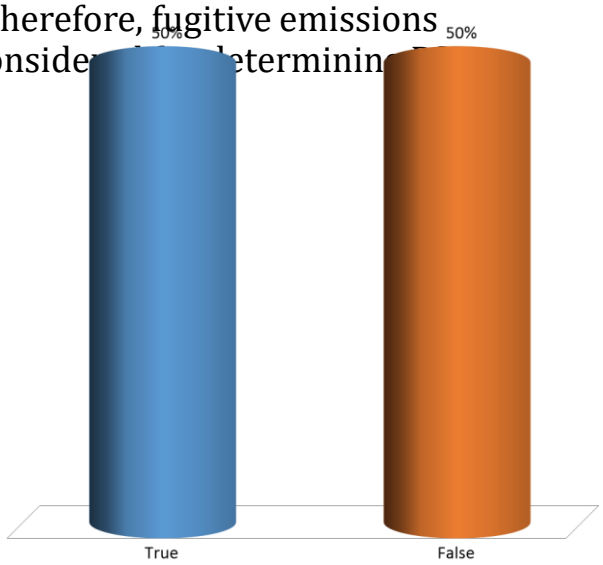
- Fugitive emissions associated with <u>modifications</u> at ALL types of existing major sources are an entirely different matter.

41

A coal prep plant of the type covered by the NSPS in 40 CFR part 60, Subpart Y, which was promulgated prior to August 7, 1980. The coal prep plant includes emissions units that are not regulated as "affected facilities" under the NSPS. Therefore, fugitive emissions from only the affected facilities are conside[illegible]eterminin[illegible] major source status.

A. True

✓ B. False



42

Major Modification (under PSD)

- ANY physical change in or change in the method of operation of a major stationary source that would result in:
  - a significant emissions increase and
  - a significant net emissions increase.

    (unless meet exemption criteria…)

- Emissions increases are evaluated on an *actual annual* basis.
- Rule 62-210.200(151), F.A.C.

43

PSD Significant Emission Rates

[62-210.200(234), F.A.C.]

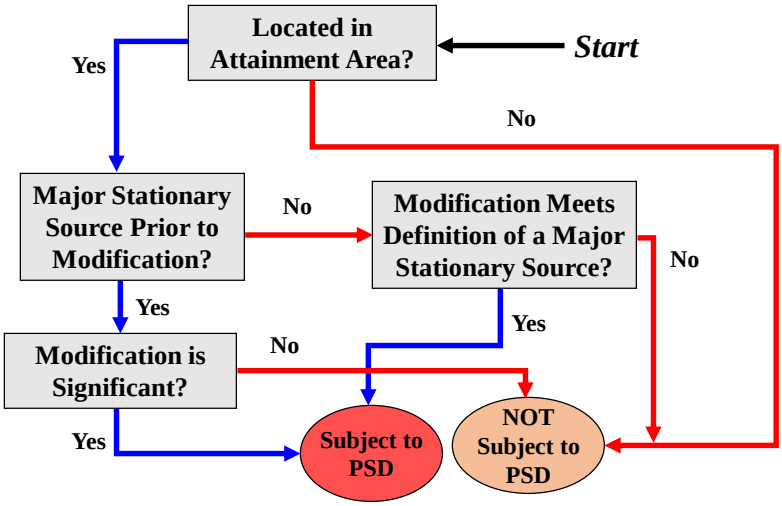
Pollutant	Significant Emission Rates (tons/year)
Carbon monoxide	100
Nitrogen oxides	40
Sulfur dioxide	40
PM_{10}	15
$PM_{2.5}$	10
VOCs	40
Lead	0.6
**GHG (CO_2e basis)	75,000

*Only criteria pollutants and GHG presented here

** The GHG thresholds are NOT (yet) defined at 40 CFR 52.21(b)(23). The "Subject to Regulation" thresholds apply (75,000 tpy and 0 tpy as shown above). EPA's current *proposal* sets a GHG (CO2e) SER value between 30,000 tpy and 75,000 tpy.

44

Is a Project Subject to PSD?



45

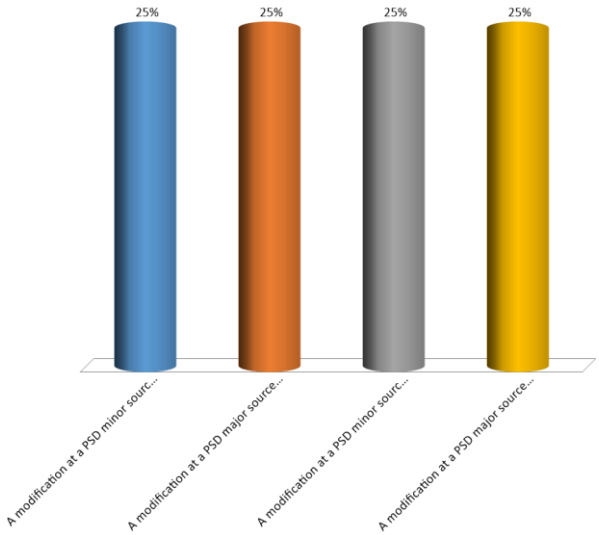
Which of the following projects would be subject to PSD permitting?

A. A modification at a PSD minor source which causes a potential emissions increase greater than a significant emissions rate, but less than 100 tpy.

B. A modification at a PSD major source which causes a potential emissions increase greater than a significant emissions rate, but less than 100 tpy.

C. A modification at a PSD minor source which causes an actual emissions increase greater than a significant emissions rate, but less than 100 tpy.

✓ D. A modification at a PSD major source which causes an actual emissions increase greater than a significant emissions rate, but less than 100 tpy.



46

PSD Major Modification - Exclusions

- 62-210.200(151)(a), F.A.C.: Modification defined as - Any physical change in or change in the method of operation of a major stationary source that would result in a significant emissions increase of a PSD pollutant and a significant net emissions increase of that pollutant from the major stationary source
- 62-210.200(151)(c), F.A.C.: A physical change or change in the method of operation shall not include:
  - Routine maintenance, repair and replacement.
  - Use of an alternative fuel or raw material
  - An increase in the hours of operation or in the production rate
  - Any change in ownership at a stationary source.

47

PSD Major Modification - Exclusions

- Routine maintenance, repair, or replacement (RMRR)
- Use of an alternative fuel or raw material (if capable of using before Jan. 6, 1975)
- Increase in hours of operation or production rate (unless prohibited)
- Change in ownership

48

Alternative Fuel or Raw Material (example)

- Ashland Chemical Company notified EPA Region 3 on January 19, 1981 that Ashland wished to change the feedstock of its maleic anhydride plant in Neal, West Virginia, from benzene to butane.
- Ashland stated that it was aware of the PSD requirements and believed that they did not require Ashland to obtain a permit before changing feedstocks.
- The company argued that its Neal plant was "capable of accommodating" butane before January 6, 1975 and that PSD, therefore, did not apply, as specified by 40 CFR 52.21(b) (2) (iii) (e).
- On April 10, 1981 Region 3 notified Ashland that [Region 3] believed the company did require a PSD permit.

49

Alternative Fuel or Raw Material (example)

- EPA Region 3's May 27, 1981, <u>initial</u> determination (Ashland Chemical)
  - "Region III stated that our view was that under the PSD regulations a source could be considered "capable of accommodating" an alternative fuel as of January 6, 1975 only if construction of the source had "commenced" as of that date. We pointed out that Ashland could not be considered to have "commenced" construction as of January 6, 1975 since Ashland had not obtained a State construction permit as of that date."

50

Alternative Fuel or Raw Material (example)

- Ashland Chemical – July 13, 1981 memo from USEPA to EPA Region 3
  - "In a memo dated May 27, 1981, you requested a determination from this Office regarding the applicability of PSD review for a switch in feedstock materials at Ashland Chemical's maleic anhydride plant in Neal, West Virginia. Ashland proposes to change its feedstock from benzene to butane, which will eliminate benzene emissions but will increase VOC emissions by approximately 2500 tons per year."
  - "The PSD regulations (40 CFR 52.21 (b) (2) (iii) (e)) exempt from review fuel switches or use of an alternate raw material if the source was capable of accommodating the fuel or material before January 6, 1975. This exemption is a result of the intent expressed by Congress that Section 169 of the Clean Air Act (Act) adopt to the extent possible, the same definition of "modification" used in Section 111 (a) of the Act (43 FR 26396)."

51

Alternative Fuel or Raw Material (example)

- "A facility shall be considered to be designed to accommodate an alternate fuel or raw material if that use could be accomplished under the facility's construction specifications as amended prior to the change."
- "Information from Ashland Chemical indicates that the facility was originally designed to use either benzene or butane. Contracts for the construction of the facility, which included dual feedstock capability, were signed in May 1974. Thus, it appears that the facility was capable of accommodating butane as an alternate feedstock before January 6, 1975 and the proposed switch to butane should not be subject to PSD review."

52

Alternative Fuels – January, 2000

- USEPA Region 4 letter (to ADEM):
  - "The stated intent of the NSPS exemption was to "eliminate inequities where equipment had been put into partial operation prior to the proposal of the standards," 36 FR 15,704 (August 3, 1971). Hence, the alternative fuels exemption was designed to eliminate inequities faced by facilities which designed and constructed units to burn more than one fuel, but which were not burning all of those fuels as of January 6, 1975."
  - "For example, absent the exemption, a facility equipped to burn coal and oil, but which was only burning oil at the time the NSPS were adopted, would be subject to the NSPS and subsequently PSD review merely by switching back to coal."
  - "Therefore, EPA believes it is reasonable to interpret the alternative fuels exemption to apply only to fuels which were contemplated in the design and construction of a unit prior to January 6, 1975 **and to which the unit remains continuously able to burn.**"

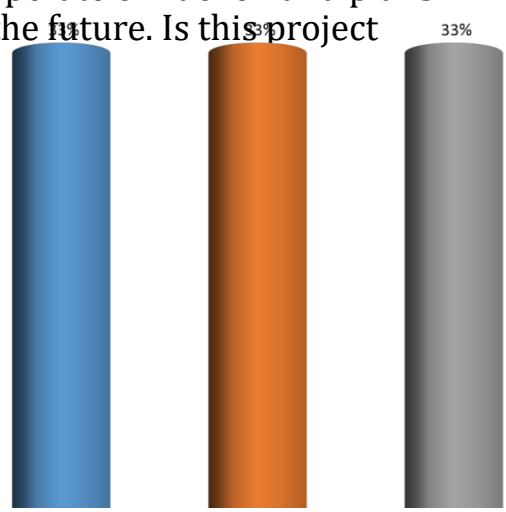
53

A boiler is permitted to burn natural gas and No. 2 fuel oil. The boiler is operated exclusively on natural gas for 10 years and the facility does not upkeep regular maintenance such that the boiler cannot fire fuel oil without replacing existing parts. The facility now wishes to restore the boiler's ability to operate on fuel oil and plans to burn at least 500 gallons per year in the future. Is this project exempt from PSD permitting?

A. Yes

B. No

✓ C. Maybe



54

Routine Maintenance, Repair, Replacement Exclusion

- Likely the most hotly debated NSR topic over the past 40 years
- There has always been doubt among the legal community whether the exclusion has any legal basis or foundation
- If a legal basis exists, how narrow or broad should the RMRR exclusion be?

55

Routine Maintenance, Repair, Replacement Exclusion

- The legal foundations (or theories) for RMRR
  - De-minimis theory – Certain activities are too insignificant to address
  - "Chevron" theory - Agency discretion since the phrase "any physical or operational change" is ambiguous
- Under the "de-minimis" theory, RMRR activities are, in fact, physical or operation changes – but clearly insignificant since "congress did not intend that trivial or routine activities would trigger NSR?"
- Under the Chevron theory, RMRR activities are NOT physical or operation changes. (The agency makes the case that the CAA definition "any physical change in, or change in the method of operation of" is ambiguous.) Thus, EPA can exclude these activities
- It appears the EPA has never made a clear distinction between these two distinct theories when asserting its authority to write the RMRR exclusion into the rule

56

Routine Maintenance, Repair, Replacement Exclusion

- Does project qualify for routine maintenance, repair, replacement exemption?
- Criteria to Assess:
  1. Nature
  2. Extent
  3. Purpose
  4. Frequency
  5. Cost

57

RMRR - Nature

- Will the activity/project add new tangible assets or leave existing tangible assets in better condition than new?
  - In contrast to an activity to prevent failure or maintain equipment in good working order
- Does the activity/project require extensive pre-planning (multiple years) and/or authorization from the [Capital Projects] department or Board of Directors?
- Does the activity or project require approval from another regulating agency?

58

RMRR - Nature

- Will the activity or project require use of materials/equipment, or other resources that are not typically stored onsite or otherwise readily available?

- Is the activity or project designed to restore equipment that has been shut down?
  - Could the shutdown have been inferred by regulatory agencies as permanent?
  - Has the subject equipment been excluded from the State's emissions inventory?
  - Have the permits for the equipment subject to this activity/project been surrendered/cancelled?

59

RMRR - Extent

- Does this activity/project involve the replacement of the entire emissions unit or a significant piece of mechanical equipment?
- Does this activity/project involve the replacement of major components or involve the replacement of a significant number of minor components?
- Are the components to be maintained, repaired or replaced of considerable size, function or importance relative to the operation of the equipment?
- Could the collection of all activities performed (as a whole) to the equipment be considered non-routine
  - Is it common to perform all activities at the same time?

60

RMRR - Extent

- Would the project/activity be considered the functional replacement of a piece of equipment or emissions unit?
- Will the time duration of the activity exceed the time duration of a *typical* maintenance time frame for a routine/planned or forced maintenance activity?
- Could the activity/project be interpreted as anything other than a regularly scheduled equipment outage to maintain the equipment in good operating condition?

61

RMRR - Purpose

- Does the project cause a change in the method of operation of the equipment or unit?
  - For example: a change in operating conditions or provide a product/service that the equipment/unit was not previously capable of providing.
- Does the project allow a change in fuels or feedstocks that the unit/plant was previously incapable of accommodating?
- Will the project increase the operating hours (per year - reduce downtime) or throughput of the equipment or plant as a whole?

62

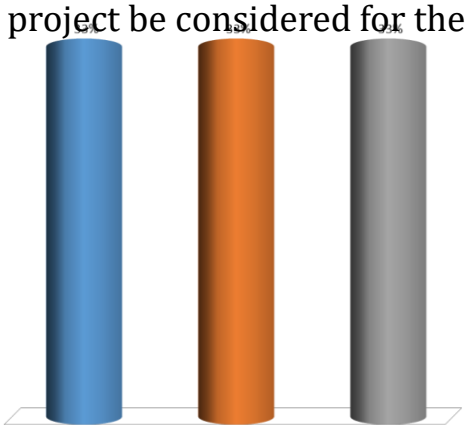
RMRR - Purpose

- Will the project reduce “wear and tear”(corrosion/erosion) or increase the duration between planned/scheduled maintenance activities?
- Does the project allow for the installation of enhanced or redesigned or upgraded equipment?
  - Rather than "like-kind" equipment replacements
- Will the project extend the useful life of the equipment/unit beyond its normally expected lifetime?
- Will the project increase efficiency, increase capacity, or restore lost capacity of the equipment/unit?

63

A facility is a PSD major source and permitted to operate a batch reactor for 200 batches annually. Currently, the batch reactor only operates for 50 batches annually. The facility wishes to replace the existing catalyst, which has grown inefficient, as part of regular scheduled maintenance. After installing the catalyst, the reactor is expected to regain efficiency and begin operating 100 batches annually. Can the catalyst replacement project be considered for the RMRR exception?

A. Yes
B. No
✓ C. Maybe



64

RMRR - Frequency

- Has the activity been characterized as "non-routine" in any internal documentation, proposals, RFPs, or vendor literature?
- Is the activity performed on an infrequent basis for this type of equipment/unit at this facility?
  - How often is this project/activity performed on this piece of equipment/unit during its lifetime?
- Is the activity performed on an infrequent basis for this type of equipment/unit on an industry-wide basis?
  - How often is this project/activity performed on this type of unit as an industry standard?
- Could the project/activity be considered "highly unusual" for the equipment/unit or plant?
  - A project of this type has never been done, or is not typical for the equipment/unit.

65

RMRR – Cost

- Replacement value of the equipment or process unit based on any of the following:
  - An estimate of the fixed capital cost of constructing a new process unit, or
  - The current appraised value of the process unit, or
  - The insurance value (where the insurance value covers only complete replacement), or
  - The investment value adjusted for inflation, or
  - Another accounting procedure if such procedure is based on Generally Accepted Accounting Principles and acceptable to the reviewing authority.

66

RMRR - Cost

- Will the cost of the activity/project exceed the typical annual maintenance budget for the equipment/unit?
- Will the activity/project involve a significant capital cost (both in absolute terms and relative to the cost of a new piece of equipment/unit)?
- Will funding for the activity/project consume a large portion of, or exceed the Operation and Maintenance Department's annual budget?
- Will funding for the activity/project originate primarily from the Capital Projects budget?
  - Rather than the Operation and Maintenance budget.

67

Routine Maintenance, Repair, Replacement Exclusion

- Situations that probably DO NOT qualify for exemption
  - Adding new equipment
  - Changing process design or control technologies
  - Life extension projects
  - Changes that affect capacity
  - Changes that enable production of alternate product
  - Relatively high cost projects
  - Changes that have never been performed previously

68

RMRR Exclusion Unfavorable Attributes

- Based on the various court decisions, EPA rulemakings and general EPA guidance, actions that tend to NOT favor the use of the RMRR exclusion are:
  1. Use of capital funds rather than funds from maintenance accounts;
  2. A purpose to increase the efficiency or extend the life of a unit nearing the end of its life expectancy, upgrading or modifying equipment to be replaced;
  3. Projects that require extended shut down periods,
  4. Using parts that are not stored on the site;
  5. Engaging independent contractors to perform work or design equipment;
  6. Extensive planning;
  7. Costs that exceed maintenance budgets,
  8. Expenditures that require the approval of corporate officers;
  9. Projects scheduled independent of routine maintenance projects, and
  10. Large physical size of units replaced.

69

RMRR Exclusion Favorable Attributes

- Likewise, based on the various court decisions, EPA rulemakings and general EPA guidance, actions that tend to favor the use of the RMRR exclusion are:
  1. The purpose of the project is to correct unexpected outages,
  2. The project does not increase the capacity of the units,
  3. The project is repetitious, commonplace, performed according to established procedure;
  4. The project is frequent, inexpensive, necessary, regular, customary, and takes place over a short term period;
  5. Projects performed by in-house personnel;
  6. Projects performed during regular maintenance periods;
  7. Expenditures that require the approval of plant managers, and not corporate officers and
  8. Projects funded from maintenance accounts.

70

Example – Waterwall Replacement at Lansing Smith Generating Station

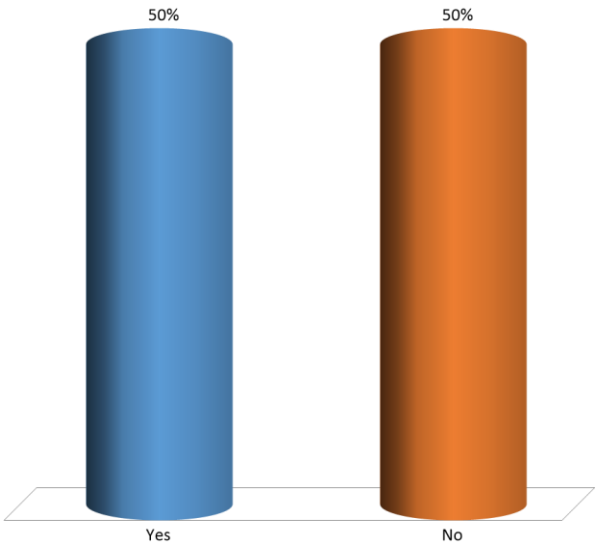
- 200 MW coal-fired utility unit. In service date was 1967.
- Necessary to replace the waterwall tubes in the boiler to retain current operating capacity and maintain established normal operations. Replacement was necessary because it wasn't feasible to repair the existing tubes.
- Applicant claimed that erosion was due to the installation and operation of low NO_X burners and corrosion due to water chemistry excursions.
- The replacement waterwall tubes are like-kind materials and no new capacity or operational changes are contemplated.
- The project will require about 20 weeks to complete and cost approximately $3.5 MM

71

Based on this criteria, should the waterwall replacement project be subject to a PSD review?

✓ A. Yes

B. No



72

Example – Waterwall Replacement at Lansing Smith Generating Station

- Is the project exempt from the definition of modification as provided in Section 62-210.200, F.A.C.?
  - A physical change or change in the method of operation shall not include: 1. Routine maintenance, repair, or replacement of component parts of an emission unit.
  - According to EPA's Detroit Edison "Dense Pack Determination", there is a rule of law that exclusions from generally applicable regulations should be construed narrowly.
  - The Department determined that the project was not routine due to the cost, length of outage and scope (complete replacement of watertube walls) vs the small size of the unit.

73

Example – Waterwall Replacement at Lansing Smith Generating Station

- The limiting pollutants were determined to be NO_X, PM and SO_2. Emission factors (lb/MMBtu) were developed from CEMS data for NO_X and SO_2 and from stack tests for PM.
- Projected future utilization for the unit provided by the applicant indicated no significant change in future utilization. In addition, the emission factors for NO_X and PM were predicted to remain unchanged. SO_2 emissions were reduced due to limitations driven by the SO_2 NAAQS.
- DEP concluded that PSD would not be applicable and required a minor source AC permit.
- No new conditions were imposed, except for the requirement to submit annually, for a period of 5 years of post-change operations of the unit, information demonstrating that the change did not result in a "significant net emissions increase".

74

Example – Waterwall Replacement at Lansing Smith Generating Station

- Since the project is not exempt, is the required permitting considered to be major (PSD) or minor (AC)?
- The applicant claims that the project will have no effect on the emission rate of the unit (lb/hr) or the utilization of the unit
- The applicant also claims that there will be no "net emissions increase" caused by the project and that only a minor source AC permit is required

75

PSD Avoidance Permit Actions

- Restrictions proposed through permit application to synthetically limit project (or net) emission increases or facility potential
- Restrictions self defined
  - Emission limits
  - Process limitations
  - Operating hour limits
  - Material content limits

76

PSD Avoidance Permit Actions- Major Sources

- Existing major PSD sources can synthetically limit project (or net) emission increases to less than PSD Significant Emission Rates
  - Install technology necessary to limit emission increases voluntarily
  - Take restrictions on raw materials and/or fuels
  - Limitations can be tied to specific emission units, process line, or the entire site

77

PSD Avoidance Permit Actions

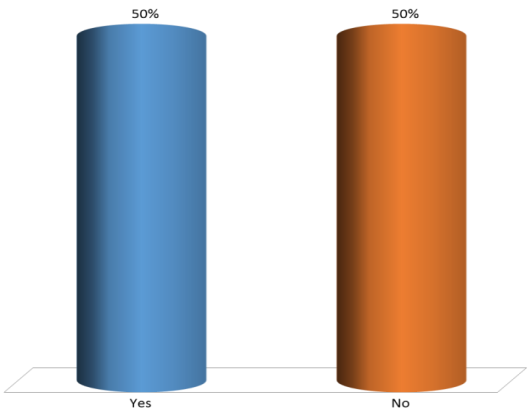
- Relaxation of existing PSD synthetic minor limits
  - 40 CFR 52.21(r)(4): At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements or paragraphs (j) through (s) of this section shall apply to the source or modification as though construction had not yet commenced on the source or modification.
  - See also Rule 62-212.400(12), F.A.C. – "Source Obligation"

78

A surface coating facility is a PSD synthetic minor source by limiting total coating usage to maintain VOC emissions below 250 tpy. The facility decides to request the limits be removed from the permit and the facility be reclassified as a PSD major source. Does this permitting action require a PSD applicability analysis?

✔ A. Yes

B. No



79

Summary of Applicability Equations

- Net Emissions Increase/Change (NEI)
  - NEI = PEI-CCD+CCI
- Project Emissions Increase (PEI)
  - New Units (less than two years old)
    - PEI = PTE – 0
  - Existing/replacement Units (rule allows 2 calculation options)
    - PEI = PAE – BAE OR
    - PEI = PTE (post modification) – BAE

PAE = Projected Actual Emissions - Emissions unrelated to change and "could have accommodated" during baseline period are excluded

BAE = Baseline Actual Emissions

PTE = Potential to Emit - Often set by permit as a "synthetic minor" limit to avoid PSD permitting

CCD = Contemporaneous Creditable Decreases

CCI = Contemporaneous Creditable Increases

80

Modifications – Netting Out of PSD

- A major modification occurs if there is a "significant emissions increase" and a "significant net emissions increase":
  - STEP 1: emissions changes specifically associated with project (PEI) > PSD major mod thresholds, AND
  - STEP 2: "net" emissions increases (within 5+ year time window) > PSD major mod thresholds
- Complex procedures allow netting out of PSD review if certain emissions decreases offset proposed emissions increases
- Netting ("contemporaneous") window is 5+ years
- Volumes of EPA guidance dedicated to the subject, lots of nuance

81

81

Emissions Netting

- If project emissions increases (PEI) are greater than significance levels, can attempt to "net-out" of PSD review
- Net emissions change (NEC or NEI) equals:

emission increases - proposed project/modification (PEI)

minus

source-wide creditable contemporaneous decreases (CCD)

plus

source-wide creditable contemporaneous increases (CCI)

82

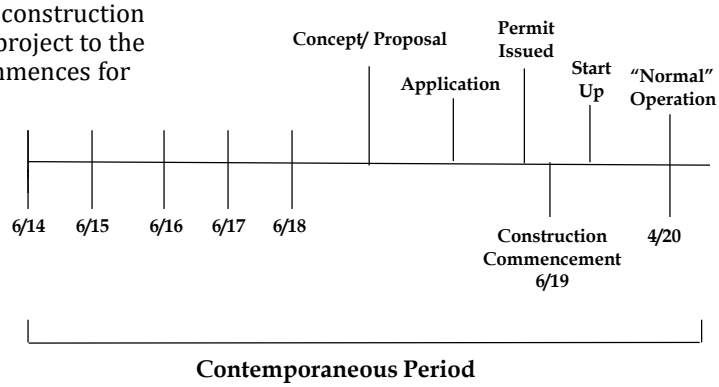
Emissions Netting

- Project emissions increases (**PEI**) can be further evaluated as the sum of three components:
  - Modified unit(s) emissions increases (**MUEI**) - these unit are being physically or operationally changed
  - Associated unit(s) emissions increases (**AUEI**) - these units are not physically changed as part of the project
  - New unit(s)
  - PEI = MUEI + AUEI + New Units

83

PSD Definitions - Contemporaneous

The contemporaneous period is the period ranging from 5 years before construction commences on a particular project to the time normal operation commences for that change



84

PSD Definitions - Creditable

- Contemporaneous emissions **decreases** associated with a particular change are considered creditable if they are federally enforceable (permitted) on and after the date construction on the proposed modification commences

- Generally, actual reductions must take place before the date the emissions increase from any of the new or modified emissions units occurs

85

PSD Definitions - Creditable

- An increase or decrease in emissions is creditable (included in a project's netting calculation) if it was **NOT** previously "relied on" in issuing an enforceable **PSD permit** for the source
  - Emissions changes associated with new units and modifications to existing units that have already been authorized in PSD permit are not creditable
  - EPA has interpreted this to mean all emissions changes (for a given pollutant) prior to the most recent PSD permit at the site are also not creditable
- Generally, otherwise creditable increases and decreases in emissions are included in current netting calculations if not the result of a project that triggered PSD for that pollutant and did not occur **prior** to a PSD project (even if the same emissions increases/decreases were considered in a netting calculation for a past project that did NOT trigger PSD)
- Generally, reductions due to installation of controls to comply with HAP rules (MACT, etc.) are creditable

86

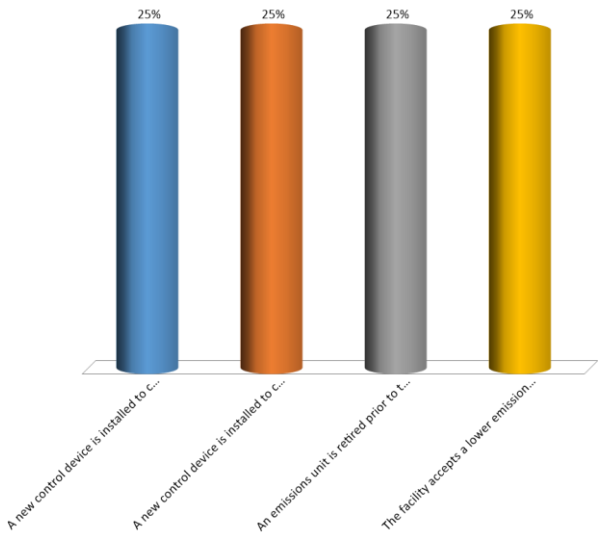
Which of the following is **NOT** a creditable decrease which can be used in project netting?

A. A new control device is installed to comply with a new MACT requirement.

✓ B. A new control device is installed to comply with BACT as part of a previous PSD project.

C. An emissions unit is retired prior to the project.

D. The facility accepts a lower emissions limit on existing units.



87

Reactivation of Sources/Units

- Consideration of past actual emissions (baseline actual emissions) may be the difference between PSD and non-PSD for a project
- New source BACT vs. existing source BACT
- Policy dates back to 1978
  - Reactivated source considered a new source if shutdown was permanent
  - Reactivated source considered existing source if shutdown was not permanent

88

Reactivation of Sources/Units, cont.

- Evidence of permanence
  - Shutdown lasting two years or more
  - Removal of source from the emissions inventory
- Shutdown beyond two years?
  - Assess whether owner has demonstrated a "continuous intent to reopen"

89

Reactivation of Source/Units, cont.

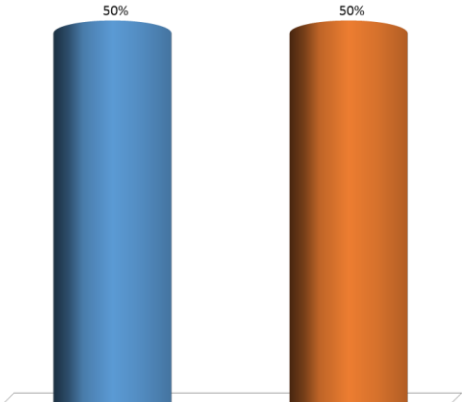
- Burden of proof to rebut presumption on operator
  - Reason for shutdown
  - Statement regarding intent
    - "Restart at a moment's notice"
  - Cost/time to reactivate
  - Status of permits
  - Ongoing maintenance and inspections during shutdown

90

Company W operates two identical facilities which manufacture widgets and are PSD major sources. Due to the decrease in demand for widgets, the company idles one facility. During this time, Company W performs regular maintenance checks on the idled facility and applies for a renewed Title V permit. After 5 years, sufficient demand returns such that Company W determines to reactivate the idled facility. Is Company W required to perform a PSD analysis to reactivate the facility?

A. Yes

✓ B. No



91