

PSD/NSR Exercises

Exercise 1. Emissions unit type

Source A obtains a permit for, and constructs, an emissions unit that first operates on 2/1/21, then is shut down from 6/1/21 to 12/1/21, after which it is operated continuously. It is now 3/1/23 and the source proposes to modify the unit. Since the unit has operated a total of only 17 months since it first began operation, does it qualify as a new emissions unit?

Exercise 2. Stationary source determination

A Kraft mill and a paperboard container manufacturing operation, which have the same 2-digit SIC code (26), are on contiguous property and are both owned by the same company. Each facility has its own plant manager and the two plants are parts of different divisions of the company, with a separate President of each division. Are the two facilities separate sources? Why?

Exercise 3. Support facility determination

The Kraft mill includes a wood-fired steam boiler that supplies 100% of its output to the mill. The Kraft mill and boiler have different 2-digit SIC codes, but are commonly owned and on adjacent property. Should the boiler be considered a separate stationary source for PSD purposes?

Exercise 4. Support facility allocation

A Kraft mill and a sawmill share a logyard area where timber is received and stored. The quantity of timber by weight that is received by the yard is estimated to be 25% for the sawmill and 75% for the Kraft mill. All 3 facilities are under common control and adjacent, but the two mills are separate sources because of their SIC codes. How are the logyard emissions assigned in determining emissions from the Kraft mill and the sawmill?

Exercise 5. PTE and enforceable conditions

A lime plant kiln (a listed source category) with potential emissions of 240 tpy PM operates only 8 hours per day and has over the last two years averaged actual PM emissions of 80 tpy. For PSD purposes, what is the kiln's PTE? Would the PTE be reduced if the source agrees to document its work hours and submit a quarterly report to verify the 8 hour per day maximum operations? Would the PTE be reduced if the source agreed to comply with a legally and practicably enforceable emissions limitation of 95 tpy PM?

Exercise 6. PTE

A printing press is operated 8 hours per day at full capacity and generates 90 tpy of actual VOC emissions. It has been operated that way for the last 5 years and is not expected to increase hours of operation because business has stayed the same volume all this time. There are no enforceable limits on the press. What is the potential to emit of the press?

Exercise 7. PTE

A 100 million Btu/hour wood-fired boiler is also capable of burning coal and oil. Sulfur dioxide emissions depend on the fuel. Assuming the following emission factors, calculate the SO₂ potential to emit of the boiler for PSD purposes:

Wood: 0.001 lb SO₂/million Btu

Oil: 0.3 lb SO₂/million Btu

Coal: 0.8 lb SO₂/million Btu

Exercise 8. PTE and PSD applicability

A new Kraft mill locating in an attainment area for all pollutants has a potential to emit 80 tpy of TRS, 150 tpy of NO_x, 60 tpy of sulfur dioxide, 12 tpy of PM_{2.5}, 13 tpy of PM₁₀, 10 tpy of PM, 30 tpy of VOC, and 50 tpy of hydrogen sulfide. Is it subject to PSD review? If so, which pollutants must be reviewed?

Exercise 9. Fugitive emissions (FE) and source category

The coal stockpile at a proposed power plant (which is one of the 28 listed source categories in the PSD rule under the definition of a major stationary source) is estimated to emit 175 tpy PM, 85 tpy of PM₁₀ and 75 tpy of PM_{2.5}. Are these fugitive emissions? Are they included in determining PSD applicability? Would the emissions be included in calculating PTE if the stockpile was at a surface coal mine, which is not one of the listed source categories?

Exercise 10. FE

The proposed power plant in Exercise 9 is required to go through PSD permitting. Are the fugitive emissions from the coal stockpile included in the BACT and impact analyses?

Exercise 11. Construction

An existing steel mill is issued a PSD permit to construct a new electric arc furnace. In the first 12 months after the permit became effective, the site for the furnace was cleared and graded and the furnace was ordered via a contract with a 20% penalty clause, specifying that the furnace was to be constructed at that site. During Month 13, there was a recession, so no further work was done until Month 20, when the site was excavated and the pad and foundations were laid. Was construction commenced within the time period required?

Exercise 12. Exclusions

A tire manufacturer is a PSD major source and plans to add a second shift. This will increase operating hours from 8 hours per day, 5 days per week, to 16 hours per day, 5 days per week. The plant does not have any permit restrictions on operating hours or production. Does the additional shift constitute a modification? Why? What if the facility had accepted a permit limit of 8 operating hours per day?

Exercise 13. Exclusions

A PSD-major chemical plant finds a way to reduce maintenance downtime on a mixing unit by using a different alloy for the mixer that resists corrosion better. This allows the unit to operate 3 additional days each year. The unit has potential emissions of 365 tpy of PM and its most recent 2-year average actual emissions are 200 tpy. Is the action taken to reduce maintenance time a physical or operational change? If so, by how much do emissions increase as a result of the change? Would this be a major modification?

Exercise 14. Exclusions and existing unit calculations

A Kraft mill, originally constructed in 1972, and that is a major PSD source, plans to begin controlling TRS emissions of 200 tpy by combusting the gas in a boiler, which would result in a reduction of the TRS emissions to only 5 tpy, but would increase sulfur dioxide emissions by 246 tpy. Is this action subject to PSD?

Exercise 15. Exclusions

A boiler (at a major PSD source) capable of burning coal and oil was constructed in 1970. The coal handling system was removed in 1985, but the boiler itself was not changed. The plant now wants to start burning coal again. Will this be a modification?

Exercise 16. Project aggregation

A cement plant that is PSD-major plans to expand capacity by adding two identical units, each of which would increase NO_x emissions by 30 tpy, SO₂ emissions by 25 tpy, PM emissions by 9 tpy, PM10 emissions by 14 tpy, and PM2.5 emissions by 9 tpy. Both units were approved by the Board of Directors and funded at the same time. The source plans to construct and start up the first unit before beginning construction of the second unit. Since each unit by itself is a minor modification, the plant plans to apply for 2 different minor modification permits about 10 months apart. Is there any problem with doing this?

Exercise 17. New unit calculation

A chemical plant is a major source in an area that is attainment for all pollutants. It proposes to add a new processing unit to the facility with potential emissions of VOC of 60 tpy, but estimates actual emissions will be 35 tpy. Under the Reform Rule, is the proposed modification a major modification subject to PSD review?

Exercise 18. Emissions unit status and calculation

A utility boiler has been plagued with problems since it began operation 22 months ago. It has potential SO₂ emissions of 300 tpy and is expected to operate at 80% capacity, so is projected to have 240 tpy actual emissions, but as a result of the problems, emissions for each year have been as follows:

Year 1: 80 tpy

Year 2: 140 (projected)

The changes needed to fix the unit require a permit and the application was submitted during Month 23. The PTE will not change. Will the project be subject to PSD?

Exercise 19. Emissions unit status and calculation

The boiler in Exercise 18 delayed its repair project, so did not submit an application. Now, 11 months through its 3rd year, the facility decides to go through with the plans to fix the boiler. Year 2 emissions were actually 145 tpy, but the problems have worsened in the 3rd year, so the best 24 months of actual emissions average 120 tpy. The repaired boiler would have a PAE of 240 tpy. PTE would not change. What would be the increase in emissions? Would the project be subject to PSD?

Exercise 20. Replacement unit determination and calculation

A textile mill is an existing major source and plans to replace a boiler with an identical new boiler and operate it the same as the old boiler. The existing boiler has a capacity equivalent to 90 tpy nitrogen oxides; baseline actual emissions (BAE) have been 40 tpy averaged over the last two years. Is this a modification? If so, what emissions increase would occur?

Exercise 21. Project emissions increase/replacement unit determination

A PSD-major plywood manufacturing plant's production is limited by the veneer dryer, but has been operating at full capacity 3 shifts per day for the last two years. The press has a capacity that requires only 2 shifts to keep up with the dryer. The source plans to install a second identical press (same emissions rate) that would increase capacity to the point that the presses could be operated by only one shift and still keep up with the dryer; the dryer still bottlenecks the process. Each press has a PTE of 60 tpy VOC, but the dryer limits total press use to 50 tpy. The PTE of the process and actual emissions would be the same. Is the addition of the new press a major modification?

Exercise 22. Project emissions increase calculation with increased utilization

A boiler has a capacity equivalent to 800 tpy of SO₂ emissions, but has been operating at the 700 tpy SO₂ level because of a down market for the type of material produced at the facility. The plant proposes to install a new machine to take advantage of the market for high-grade product. The new machine has potential emissions of 35 tpy VOC and will result in the boiler being used to full capacity. The major source has no netting credits available. Based on the information available to you, is this action a major modification?

Exercise 23. Netting

A PSD-major Kraft mill plans to install an additional lime kiln that will increase potential NO_x emissions by 100 tpy, PM emissions by 30 tpy, and PM-10 and PM_{2.5} emissions by 30 tpy. The mill proposes to take enforceable reductions of potential emissions elsewhere at the plant of 80 tpy NO_x, 10 tpy PM, and 25 tpy PM-10/PM_{2.5}. There are no other potentially creditable increases or decreases. The area is attainment for all pollutants. Does this source avoid PSD review?

Exercise 24. Minor source modification calculations

A surface coating operation (which is not one of the listed source categories) has a plant-wide (but not a PAL) limit of 240 tpy of VOC, making it a minor stationary source. It proposes to add new capacity equivalent to 35 tpy of VOC and use that capacity continually so an increase of 35 tpy actual emissions is projected. The 35 tpy increase would not trigger PSD review, but is this the best course of action for the source to take in terms of future expansion?