Minnesota Pollution Control Agency
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WS-01

Determination of Increases at Major PSD Sources

Air Quality Permit Program

Doc Type: Permit Application

Instructions on Page 6

Use this Worksheet to calculate and document emissions increases at existing major Prevention of Significant Deterioration (PSD) sources where you determine that no permit amendment or notification is needed. This worksheet does not satisfy all of the recordkeeping requirements in 40 CFR § 52.21(r)(6). Read the applicable portion of the rule to determine which recordkeeping and reporting provisions apply to your project.

1a) AQ Facility ID No.: _____ **1b)** AQ File No.: _____

2) Facility name: _____

3) Project description: _____

4) Date actual construction to begin: _____

A. Modified, Replacement, and/or Debottlenecked Emission Units

Use Table 1 to document the emissions changes at each emissions unit associated with or potentially affected by your project using the calculation method found in 40 CFR § 52.21(a). The procedure for calculating whether a significant emissions increase will occur depends on the type of emissions unit being modified. See instructions for calculating emissions increases. Complete Table 1 for each modified, replacement, or debottlenecked emission unit. Summarize the total increases for each pollutant in Table 2.

Table 1 – Modified, replacement, or debottlenecked emission unit

EU/TK/FS: ☐ Modified ☐ Replacement ☐ Debottlenecked ☐ Electric utility steam generating unit

5a) Pollutant	5b) Baseline period	5c) Baseline actual emissions (tpy)	5d) Adjusted baseline actual emissions (tpy)	5d) Description of adjustments to baseline	5e) Projected actual emissions (tpy)	5f) Exclusions from projected actuals (tpy)	5f) Description of exclusions from projected actuals	5g) Potential to emit (tpy)	5h) Increase (tpy)
PM									
PM_{10}									
$PM_{2.5}$									
NO_x									
SO_2									
CO									
Ozone (VOC)									
Lead									
Fluorides									
Sulfuric acid mist									
Hydrogen Sulfide (H_2S)									
Total reduced Sulfur including H_2S									
Reduced Sulfur compounds including H_2S									
MWC organics									
MWC acid gas									
MWC metals									
MSW landfill gas									
CO_2e									

5i) For this unit (e.g., EU, FS, etc.), does the proposed project increase the design capacity of the unit?

☐ Yes ☐ No

5j) For this unit (e.g., EU, FS, etc.), does the proposed project increase the potential to emit of any regulated NSR pollutant?

☐ Yes ☐ No

Table 2 – Summarize the total increases of each pollutant

6a)	6b)					6c)
	EU/TK/FS _____	EU/TK/FS _____	EU/TK/FS _____	EU/TK/FS _____	EU/TK/FS _____	Total Increase (tpy)
Pollutant	Increase (tpy)	Increase (tpy)	Increase (tpy)	Increase (tpy)	Increase (tpy)	
PM						
PM_{10}						
$PM_{2.5}$						
NO_x						
SO_2						
CO						
Ozone (VOC)						
Lead						
Fluorides						
Sulfuric acid mist						
Hydrogen Sulfide (H_2S)						
Total reduced Sulfur including H_2S						
Total reduced Sulfur including H_2S						
MWC organics						
MWC acid gas						
MWC metals						
MSW landfill gas						
CO_2e						

B. Installation or construction of new emission units

Use this page to document the emission increases from each *new* emission unit. Copy this page if more than five units are added.

Table 3 – New emission units

7a)	7b) Potential to emit (tpy)										7c)
Pollutant	**EU/TK/FS**		**EU/TK/FS**		**EU/TK/FS**		**EU/TK/FS**		**EU/TK/FS**		**Total Increase (tpy)**
PM											
PM_{10}											
$PM_{2.5}$											
NO_x											
SO_2											
CO											
Ozone (VOC)											
Lead											
Fluorides											
Sulfuric acid mist											
Hydrogen Sulfide (H_2S)											
Total reduced Sulfur including H_2S											
Total reduced Sulfur including H_2S											
MWC organics											
MWC acid gas											
MWC metals											
MSW landfill gas											
CO_2e											

C. Totals

Table 4 - Summary

Pollutant	8a) Emissions increases from modified, replacement, or debottlenecked units (from 6c) (tpy)	8b) Emissions increase from new units (from 7c) (tpy)	8c) Total increase (tpy)	8d) Significant increase thresholds for major sources
PM				25
PM_{10}				15
$PM_{2.5}$				10
NO_x				40
SO_2				40
CO				100
Ozone (VOC)				40
Lead				0.6
Fluorides				3
Sulfuric acid mist				7
Hydrogen Sulfide (H_2S)				10
Total reduced Sulfur including H_2S				10
Reduced Sulfur compounds including H_2S				10
MWC organics [1]				0.0000035
MWC acid gas [2]				40
MWC metals [3]				15
MSW landfill gas				50
CO_2e [4]				75,000

Note 1 – MWC organics means municipal waste combustor organics. These are defined as total tetra-thro-octa-chlorinated dibenzo-para-dioxins and dibenzofurans.

Note 2 – MWC acid gases are measured as the sum of sulfur dioxide and hydrochloric acid.

Note 3 – MWC metals are measured as particulate matter.

Note 4 – The significant increase threshold for CO_2e is effective January 2, 2011.

D. Post Change Information

This section is a place to record other information that won't be known until after you implement your project. Some of this information is important when determining if or when other requirements apply.

9) Actual date on which you began construction of the project: _____

10) List of actual equipment changes and important dates

Table 5 – Equipment changes and important dates

10a) Emission source type	10b) Emission source ID number	10c) Description (include model and serial #s)	10d) Date of construction	10e) Date of operation

Attach the following information to this worksheet:

- Supporting calculations (editable spreadsheets, material content data, copies of reference materials used for emissions factors, test reports, etc.).
- Supporting business documentation for projected business activity.
- Supporting data for adjustments to the baseline (e.g., permit documents, stack test data, etc.).
- Supporting data for exclusions for projected actual emissions.

Instructions for Form WS-01

1a) **AQ Facility ID No. –** Fill in your Air Quality (AQ) Facility Identification Number (ID) Number (No.). This is the first eight digits of the permit number for all permits. This number is not the same as the AQ File Number in item 1b) below.

1b) **AQ File No. –** Fill in your AQ File No. This is the first group of characters in an Air Emission Facility Permit issued prior to 1994. For example, for permit number 1899AB-93-OT-1, the AQ Facility ID number would be 1899AB. It is also the number in the "cc" section of any correspondence from the Minnesota Pollution Control Agency (MPCA) regarding this facility.

2) **Facility name –** Enter your facility name.

Fill out Form CH-04 to determine your current status under New Source Review (NSR) Prevention of Significant Deterioration (PSD). If you are an existing major source under PSD, this worksheet may be used prior to construction to determine emissions increases for your proposed project. You do not have to use this worksheet, but the MPCA recommends it as a tool to document that you properly complied with applicable rules if you are asked to do so. This worksheet only addresses the PSD pollutants and does not address emissions increases of hazardous air pollutants (HAP). See Form CH-07 for changes that affect HAP emissions.

3) **Description of project –** Provide a description of each physical and operational change included in this project. Include any effects from "debottlenecking" emission units. Include a list of all activities affected by the project using the identification codes in your current permit or on the GI-05 forms from your most recent permit application (e.g., EU 001, CE 001, TK 005, FS 002).

This description should include changes to insignificant activities (IA) from Minn. R. 7007.1300, subps. 3 that are related to this project. While this worksheet does not directly ask you to calculate the emissions increases from IAs, you must include them if required by rule. Under Minn. R. 7007.1300, subp. 3, the emissions must be included if they would make the project a Title I Modification. For example, if you calculate the net emissions increase from units other than insignificant activities (IAs) to be 38 tons per year of Volatile Organic Compounds (VOCs) and your proposed new IAs have a potential to emit (PTE) of 3 tons per year of VOC, the proposed change would be significant under NSR and requires a permit. In this case the IAs should be included in the analysis and subsequent permit application.

Physical changes: Physical changes include the following activities:

- installation of new or additional emission units, such as adding a boiler
- replacement of emission units, such as removing a boiler and installing a new one in its place
- changes to existing emission units, such as replacing a burner on a boiler with one of higher capacity or which can burn different fuels
- changes which may not always be apparent from a visual inspection, such as changing the catalyst in a chemical reactor
- changes which may result in applicable requirements no longer applying, such as disconnecting fuel oil supply pipes from a boiler so that the boiler can only operate on natural gas

Operational changes: Operational changes are any type of change a source can make which might increase emissions and that are not a physical change as described above.

Examples of operational changes include:

- changing to solvents with higher Particulate Matter (PM), VOC, or HAP contents than those used in previous permit applications
- using a different chemical in the production of a product for which the equipment is already in place

Examples of changes which are **not** operational changes include:

- increasing hours of operation or production rate unless there is a permit condition which limits the hours of operation or production rate
- routine maintenance, repair and replacement
- some fuel switching may be exempt from being considered a modification if the fuel switch is required by certain federal regulations

Debottlenecking: If the installation of a new emission unit or changes to an existing unit have the effect of allowing other emission units at the facility to operate at a higher capacity than previously utilized given your existing facility design, this is called **debottlenecking.** Describe how the utilization rate of these other units will increase.

4) **Date actual construction to begin --** Fill in the date you expect to begin construction of your project.

A. Modified, replacement, and/or debottlenecked emission units

Fill out **Table 1** for each affected emitting activity. Make additional copies of the table as needed for each additional activity.

Circle the appropriate code for the given activity: EU for emissions unit, TK for tank, or FS for fugitive source. Fill in the appropriate ID number. You should be able to find this number in your existing permit or most recent permit application (Emission Unit Information Form (GI-05B), Tank Information Form (GI-05C) or the Fugitive Emission Source Information Form (GI-05D)). For units being replaced, enter the number of the unit that is being replaced.

Check the box to indicate whether the activity will be modified, replaced, debottlenecked and whether or not the activity is an Electric Utility Steam Generating Unit (EUSGU).

See the instructions for each item to determine how to fill in the columns for modified, replaced, or debottlenecked units.

***EUSGU*:** If any activity affected by this project is an EUSGU, read 40 CFR § 52.21(r)(6) to determine what additional recordkeeping and reporting provisions apply to your facility.

5a) **Pollutant** – This column contains all the regulated NSR pollutants (defined in 40 CFR § 52.21(b)(50)). You only need to fill in data for pollutants that are emitted by your equipment.

5b) **Baseline period** – Fill in the range of the 24-month period from within the last five years (for an EUSGU) or ten years (for anything other than an EUSGU), as allowed by 40 CFR § 52.21(b)(48) (e.g., Feb. 1996 - Jan. 1998, but not to precede November 15, 1990). All emitting equipment or processes must use the same baseline period for any given pollutant. **You may use a different baseline period for different pollutants.** For example, you may choose Jan 2003-Dec 2004 for VOC and June 2004-May 2005 for NO_X.

Important: In order to use the selected 24-month period as the baseline period, you must possess adequate documentation to allow the calculation of actual emissions throughout the selected period. The documentation must also allow the calculation of any required adjustments to actual emissions as discussed below. If documentation is missing or incomplete for any part of the selected 24-month period, a different 24-month period must be selected.

5c) **Baseline actual emissions** – Fill in the rows under column 5c with the actual emissions of each pollutant during the baseline period listed in item 5b, in tons per year. These emissions are the average rate of actual emissions during that time period – taking into account actual materials, actual throughputs, actual emission rates (e.g., average emissions factors vs. maximum), as well as actual hours of operation. For example, if a given unit only operated for 3 months during the baseline period, only those 3 months of emissions are included.

This calculation includes any air emissions control devices that were in operation. These emissions controls are included whether their operation was enforceable or voluntary. The actual emissions include fugitive emissions to the extent they are quantifiable, as well as emissions associated with startup, shutdown, and malfunction.

When replacing an existing unit with a similar unit, the increase is calculated in the same manner as for modification of an existing unit, provided the replaced unit is removed from the premises or rendered permanently inoperable. If this is the case, fill in the baseline actual emissions of the replaced unit in 5c.

5d) **Adjusted baseline actual emissions** – Fill in the rows under column 5d with the adjusted baseline actual emissions of each pollutant and a description of the adjustments that were made. All sources must adjust any actual emissions (listed under 5c that were not in compliance with limitations that were legally enforceable during the baseline period (40 CFR § 52.21(b)(48)(i)(b) or (b)(48)(ii)(b)). This means you must subtract off any actual emissions that were in excess of what was allowed by a permit or rule.

In addition, for all sources other than electric utility steam generating units, you must adjust the actual emissions down to reflect any limitations with which you must ***currently*** comply (40 CFR § 52.21(b)(48)(ii)(c)), but you didn't have to comply with during the baseline period. For example, you need to reduce the actual emissions to account for control equipment that is

now required but was not required or in operation during the baseline period. Any applicable requirements, emissions limits, or work practice requirements in your existing permits should be accounted for in this adjustment (unless they were applicable during the baseline period listed in item 5b).

5e) **Projected actual emissions** – Fill in the column under 5e with the projected actual emissions of each regulated pollutant for the given emitting activity. "Projected actual emissions," defined at 40 CFR § 52.21(b)(41), means the maximum annual rate, in tons per year, at which an existing emission unit is projected to emit a regulated pollutant in any one of the five years (12-month period) following the date the unit resumes regular operation after the project. If the project increases the emission unit's design capacity or potential to emit, and the potential to emit the regulated pollutant at full utilization of the unit would result in a significant emissions increase or net emissions increase, then the projected actual emissions are the maximum annual rate at which the existing emission unit is projected to emit a regulated pollutant in any one of ten years following the date the unit resumes regular operation. Projected actual emissions include fugitive emissions to the extent they are quantifiable, and emissions associated with startup, shutdown, and malfunction. Do not take air pollution control equipment into account except as allowed by Minn. R. 7007.1200, subp. 2 (i.e., if required by permit or rule you may assume its operation in your projections).

Projected actual emissions should be based on pre-existing information that was prepared for business purposes, not just for the purpose of making an NSR applicability determination. Examples include but are not limited to a stockholder prospectus, a letter to a parent company, internal capital equipment requisition requests, and other internal planning documents that detail expected future business activities. Be sure to maintain documentation of the information you use as a basis for projected actual emissions; if you do not have adequate documentation of projected business activities, then you must use future potential emissions in the calculations. You may also use future potential emissions in the calculation if you choose. You may wish to do that to avoid recordkeeping requirements, and for electric utility units, recordkeeping and reporting. For any given project, you may choose a method for each existing emissions unit, so certain existing units can be calculated using projected actual emissions and other existing units could use potential emissions.

If you aren't using projected actual emissions to calculate the increase, enter "NA" in this column.

5f) **Exclusions from projected actuals –** There are emissions that may be excluded when calculating the projected actual emissions. These exclusions are defined at 40 CFR § 52.21(b)(41)(ii)(c). Enter the emissions that can be excluded from the value listed in column 5e for each pollutant. Also include a brief description of the emissions that are excluded. You should attach and retain any necessary business documents that would support the exclusions.

5g) **Potential to emit (PTE) –** Fill in this column with the potential to emit of the modified/replacement/or debottlenecked activity for each air pollutant listed in column 5a.

PTE is the capability at maximum design capacity to emit a pollutant, except as constrained by federally-enforceable conditions (which include the effect of installed air pollution control equipment and restrictions on the hours of operation, or the type or amount of material combusted, stored or processed.) Do not take air pollution control equipment into account except as allowed by Minn. R. 7007.1200, subp. 2. You may not take credit for proposed or non federally-enforceable pollution control equipment.

For guidance on calculating potential to emit, see the MPCA's Emission Calculation webpage at http://www.pca.state.mn.us/dm0rdc9.

5h) **Emissions increase –** If you are using projected actual emissions, calculate the emissions increase for each regulated air pollutant as follows and enter the value in 5h: 5e – (5f + 5d). If you are using PTE, calculate the emissions increase for each regulated air pollutant as follows and enter the value in 5h: 5g-5d.

5i) **Does the proposed project increase the design capacity of the unit?** If the answer is Yes, there may be some additional recordkeeping and reporting that applies to your project. Read 40 CFR § 52.21(r)(6).

5j) **Does the proposed project increase the potential to emit of any regulated PSD pollutant?** You calculated the new PTE for this unit in column 5g. You will need to find or calculate the current PTE of the unit. You can find this information in supporting documentation for any current permits that cover the unit. If this unit is not yet covered by a permit, you should have included this information in your Part 70 or amendment permit application or have on site as required by Minn. R. 7007.1250, subp. 3. If the data does not already exist, you will need to calculate it.

If the answer is Yes, there may be some additional recordkeeping and reporting that applies to your project. Read 40 CFR § 52.21(r)(6).

Use **Table 2** to summarize the increases for all activities where you calculated emissions under item 3.

6a) **Pollutant –** This columns contains all the regulated NSR pollutants (defined in 40 CFR § 52.21(b)(50)). You only need to fill in data for pollutants that are emitted by your equipment.

6b) Fill in a column under 6b for each activity for which you calculated an emission change in **Table 1**. Circle the appropriate code: EU for emissions unit, TK for tank, or FS for fugitive source. Fill in the appropriate ID number. Copy the change from 5h of **Table 1** for each activity where you calculated a change – decreases should be indicated as negative numbers in **Table 2**.

6c) Calculate the total change for each pollutant by adding the numbers horizontally and entering the results in column 6c.

B. Installation or construction of new emissions units

If there are more than 5 new emitting activities in your project, make copies of **Table 3** as needed. Enter each new activity in a column under 7b. Identify the source type and number as described under the instructions for item 6b. For new emitting activities, these must be numbered consecutively following the last EU, TK, or FS number used for the Title V permit or listed in your most recent permit application.

The emissions increase at a new unit is equal to the potential to emit of the unit. Potential to emit (PTE) was described under item 5g.

7a) **Pollutant** – This column contains all the regulated NSR pollutants (defined in 40 CFR § 52.21(b)(50)). You only need to fill in data for pollutants that are emitted by your equipment.

7b) **Potential to emit** – Fill in each column with each activity's potential to emit for each air pollutant listed in column 7a.

7c) **Total emissions increase** – Add the emissions horizontally for each air pollutant from each new emitting activity from column 7b and fill in the total in 7c.

C. Totals

In **Table 4**, provide the annual emissions in tons per year for all pollutants listed.

8a) Include the emissions increases from the modified, replacement, and debottlenecked emissions units (from 6c).

8b) Include the total emissions increase from new emissions units (from 7c).

8c) Add the numbers in 8a and 8b and enter the total here.

Compare the total increase in 8c to the NSR significant level in 8d. If any of the numbers in column 8c equal or exceed the associated level in 8d, the emissions increase is considered significant under New Source Review and you need a major permit amendment under Minnesota Rules. Fill out the appropriate permit application forms and submit them to the MPCA. You must wait to construct and operate the planned modification until the major amendment has been issued. Since you need a permit in order to make your change, you do not need to proceed to Section D. Contact MPCA at 651-296-6300 or 800-657-3864 for further guidance.

Note: You must always use the major amendment process and complete the CD-01 form if NSR/PSD applies, if you net out of NSR/PSD, or if you propose limits to avoid NSR/PSD.

If the emissions from the proposed change or modification are not major under New Source Review, refer to Minn. R. 7007.1200 – 7077.1500 to determine the type of permit amendment needed. The MPCA's modification permit application forms may be helpful in making this determination.

D. Post change information

This section is a place to record other information that won't be known until after you implement your project. Some of this information is important when determining if or when other requirements apply.

9) **Actual date on which you began construction of the project** – Fill in the date you began construction on any part of the project.

10) Use **Table 5** to fill in what equipment changes were actually made at your facility. This list may be different than what you originally planned (e.g., you may have not added a new unit that you originally included in your analysis). You should update your analysis prior to making any changes.

Include new as well as modified/replaced/debottlenecked emissions units, tanks, fugitives, and insignificant activities.

10a) **Emission source type --** Fill in the emission source type for each emission source affected by the project as listed earlier on the worksheet. The source type codes are as follows:

EU	Emission unit
FS	Fugitive source
TK	Tank
IA	Insignificant Activity

10b) **Emission source ID no. --** Fill in the identification number of each emission unit, fugitive emissions source, or tank as listed earlier on the worksheet. If you are replacing an existing unit, the replacement unit should be assigned a new number (not the old number that it is replacing). For Insignificant Activities, list the specific subpart of the rule under which the activity qualifies (e.g., 7007.1300, subp. 3(B)(2)).

10c) **Description** – Fill in a description for each emission unit (e.g., paint booth), tank, and fugitive source. For IAs, give a general description of each activity that shows how it qualifies under the applicable subpart of the rule (e.g., furnace with heating capacity less of 200,000 Btu/hr and the total at the facility under this subpart < 2 MMBtu/hr).

10d) **Date of construction –** For new activities and replacements, provide the date on which installation of the unit started at the source. For existing units that are modified or debottlenecked, provide the date on which construction commenced.

10e) **Date of operation –** For new activities, provide the date of initial startup. For modified/replaced/ debottlenecked units, provide that date that the activity resumed regular operation after the change.