DEQ staff have identified a technical problem with the control efficiency limit as it applies to the Tier 1 CAGMs. Demonstrating compliance with this limit requires getting good numerical source test results for both the inlet and outlet of a baghouse. Observations at the Tier 1 CAGMs suggest that the particulate loading will be very low, so low as to make it difficult to get good inlet results without very long (and costly) test runs. Getting good results at the outlet will be even more difficult. This concern is borne out by testing performed by Bullseye Glass in April, 2016. DEQ typically considers 3 milligrams of sample to be the minimum preferred sample size, but even with 14 hour sampling runs some of the outlet sampling runs did not capture 3 milligrams of sample, indicating very low filterable particulate matter concentrations. One hour sampling runs are typical for this type of testing. When less than 3 milligrams of sample is captured, the result of the test is reported as “less than the detection limit”, which essentially means “the result is less than the detection limit, but the exact number cannot be specified with any confidence”.

Based on the above, staff believe it very likely that test runs of a reasonable length and cost will give results below the method detection limit, making it difficult or impossible to properly calculate the control efficiency. It is possible to improve the chances of obtaining usable results by using extremely long and costly sample runs, but even then staff cannot be certain that at least 3 milligrams of sample will be obtained.

To control costs for the Tier 1 CAGMs, staff suggest limiting the sampling run time to 1 to 3 hours. Even with 3 hour runs, results less than the detection limit are still likely.

Staff then considered the following:

1. Is there some way to use non-detect values to verify the 99.0% control efficiency?

One approach would be to say that if all results are below the detection limit, then we would consider the 99% control proven. But a mix of results, with some below detection and some above detection results, would be problematic. It’s difficult to mix actual numbers with non-detect results, but it might be possible to create a decision-making matrix that lists all possible combinations of results with a pass/no-pass determination for each combination. There are 9 possible combinations for each sampling run; another matrix would be needed to determine if the test is passed. This approach is very cumbersome and also somewhat arbitrary.

1. Can we establish a different alternative to the 99.0% control efficiency?

This is a much more practical proposition. To help answer this question, staff surveyed limits in federal New Source Performance Standards (NSPSs) and National Emissions Standards for Hazardous Air Pollutants (NESHAPs) and found a range of grain loading limits that could be used to help set a limit. If this alternative is used, the testing requirement would be simpler because testing would only be required at the emission control device outlet rather than inlet and outlet as needed to determine control efficiency. Further, results below the detection limit are much easier to handle as long as the detection limit is less than the chosen emission limit, because a result of “less than the emission limit” still shows compliance with the limit. Staff can ensure that the detection limit is below the emission limit in the source test approval process; approval of the source test is required by the proposed rule in OAR 340-244-9070.

Staff recommend the second approach discussed above.

Survey of grain loading limits in NSPSs and NESHAPs

“Grain loading” refers to a particulate matter concentration in an exhaust stream, measured as grains (1/7000th of a pound) per dry standard cubic foot of air.

Oregon has a general statewide grain loading standard of 0.10 grains per dry standard cubic foot (gr/dscf). Baghouses are capable of better performance, so staff did not consider simply using the general statewide standard. Instead, staff did a survey of grain loading limits in EPA’s NSPSs and NESHAPs. NSPSs are established to control and limit particulate matter emissions. NESHAPs are established by EPA to control and limit emissions of Hazardous Air Pollutants (HAPs). While the NESHAPs are intended to control HAPs, EPA often establishes surrogate limits. For example, a NESHAP may be intended to control metal emissions from a process, but the metal emissions are in the form of particulate matter, so EPA uses a particulate matter limit as a surrogate for the metals. Particulate matter limits in NSPSs and NESHAPs are not always expressed as grain loading limits, but in staff’s survey, a number of grain loading limits were found. The survey was not exhaustive and was done by simply skimming through the NSPSs and NESHAPs and identifying grain loading limits. Grain loading limits greater than 0.03 gr/dscf were not considered. Where multiple limits were found, the limits apply to different process units or to new versus existing facilities.

List of NSPSs and NESHAPs and grain loading limits found

| Subpart | Grain Loading Limits,  gr/dscf | Title |
| --- | --- | --- |
| NSPS | | |
| AAa | 0.0052 | Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels |
| Ec | 0.0095 | Hospital/Medical/Infectious Waste Incinerators |
| DDDD | 0.002 | Commercial and Industrial Solid Waste Incinerators (CISWI) |
| NESHAP | | |
| EEE | Existing, 0.013  New, 0.0016  Existing, 0.028  New, 0.0069 | Hazardous Waste Combustors |
| QQQ | 0.01 | Primary Copper Smelting |
| RRR | 0.01 | Secondary Aluminum Production |
| XXX | Existing, 0.011 New, 0.0017 | Ferroalloys Production: Ferromanganese and Silicomanganese |
| EEEEE | Various,  0.001 - 0.006 | Iron and Steel Foundries |
| JJJJJ | 0.0021 | Brick and Structural Clay Products Manufacturing |
| RRRRR | Existing, 0.008 New, 0.005 | Taconite Iron Ore Processing |
| TTTTT | 0.016 | Primary Magnesium Refining |
| YYYYY | 0.0052 | Electric Arc Furnace Steelmaking Facilities |
| GGGGGG | 0.005 | Primary Nonferrous Metals Area Sources—Zinc, Cadmium, and Beryllium |
| TTTTTT | Existing, 0.015 New, 0.010 | Secondary Nonferrous Metals Processing Area Sources |
| ZZZZZZ | Existing, 0.015 New, 0.010 | Area Source Standards for Aluminum, Copper, and Other Nonferrous Foundries |

In this survey, the lowest (most stringent) limits are 0.0016, 0.0017 and 0.002 gr/dscf. The first two limits apply to new facilities; that is, facilities designed from the start to meet the lower limits. The third limit applies to commercial and industrial solid waste incinerators (CISWI), which are subject to very stringent limits. Staff do not believe that these limits should be considered because the Tier 1 CAGMs addressed by the proposed rule are all existing facilities, and because they are small facilities and in staff’s judgement represent a smaller risk than either the Tier 2 CAGMs or a CISWI.

The next lowest limits range from 0.005 gr/dscf to 0.0095 gr/dscf. A number of limits are 0.010 gr/dscf or higher. Staff consider 0.010 gr/dscf an easily achievable limit for baghouses at Tier 1 CAGMs, so limits greater than 0.010 gr/dscf were not considered.

Other considerations

The Tier 1 CAGMs are relatively small businesses, and DEQ is sensitive to the costs imposed on the Tier 1 CAGMs by the temporary CAGM rule and the proposed permanent CAGM rule. In staff’s experience, baghouses perform very well at controlling particulate matter emissions, and achieve emission rates below the limits that apply if properly designed. Staff are therefore of the opinion that it is not necessary to specify a very low limit in order to achieve a high degree of emission control. On the other hand, staff do not believe an easily achievable limit is appropriate. Staff therefore propose a limit of 0.0075 gr/dscf, which is the average of the second-lowest limit found in the NESHAPs (0.005 gr/dscf) and what staff consider the easily achievable limit of 0.010 gr/dscf.

DEQ proposes to replace the 99.0 percent removal efficiency requirement for the Tier 1 CAGMs with an emission limit of 0.0075 gr/dscf. DEQ further proposes that testing to show compliance with the limit will only be required on the emission control device out. Rules typically do not go into detail on the testing requirements, and neither does the proposed rule. However, as is typical with other rules, the proposed rule requires review and approval of the test plan and DEQ staff expect to specify the necessary detail in the test plan approval.