Overview of proposed rules and reasons for approaches taken (White elephant paper)

The temporary CAGM rules being proposed at this time are significantly different from the temporary GAGM rules proposed in March, 2016. Below is a summary of the changes, with discussions about the main points of the currently proposed temporary rules.

| **Rules proposed in March** | **Rules proposed in April** |  |
| --- | --- | --- |
| **Sources affected** |  |  |
| Affect 5 known CAMGs in the Portland area. | Affect 5 known CAMGs in the Portland area. |  |
| **Treatment of CAGMs** |  |  |
| Treated all 5 CAGMs the same. | Establish two tiers for the treatment of CAGMs  Smaller CAGMs (3 of the 5 known, Tier 1 in the proposed rules) have different and potentially less burdensome requirements.  Larger CAGMs (2 of the 5 known, Tier 2 in the proposed rules) have requirements that are generally similar to those proposed in March. | See (1) below for more details |
| **Cutoffs for rule applicability** |  |  |
| Apply to CAGMs that produce 10 tons of glass per year or more. | Apply to CAGMs that produce 10 tons of glass per year or more.  Tier 1 is CAGMs that produce 10 to 100 tons per year in electrically heated furnaces.  Tier 2 is CAGMs that produce 10 tons or more per year in fuel-heated furnaces, and CAGMs that produce more than 100 tons per year in electrically heated furnaces. | See (2) below for more details |
| **Emission control device requirements** |  |  |
| Install emission control devices on glass making furnaces that use any of 4 metals (arsenic, cadmium, chromium VI and lead) by September 1, 2016. | Tier 1 CAGMs (smaller) have 3 options, and may use different options on different furnaces or groups of furnaces:   * Install emission control devices on furnaces that use any of 6 metals (arsenic, cadmium, chromium, lead, manganese and nickel) by October 1, 2016; * Exempt from the requirement to install emission control devices if able to demonstrate through source testing that emissions are less than protective levels specified in the rules; or * Request permit conditions prohibiting the use of certain metals.   Tier 2 CAGMs must install emission control devices on all glass making furnaces that use any of 6 metals (arsenic, cadmium, chromium, lead, manganese and nickel) by September 1, 2016. | See (3) below for more details |
| **Chromium III usage** |  |  |
| Chromium III may not be used in uncontrolled furnaces until testing is done to show how much, if any, chromium VI is emitted when chromium III is used (i.e. how much chromium III is converted to chromium VI). | Chromium III may not be used in uncontrolled furnaces until testing is done to show how much, if any, chromium VI is emitted when chromium III is used (i.e. how much chromium III is converted to chromium VI). | See (4) below for more details |
| **Chromium VI usage** |  |  |
| Prohibit the use of chromium VI in uncontrolled furnaces. | Prohibit the use of chromium VI in uncontrolled furnaces (Tier 1 and Tier 2). | See (5) below for more details |
| **Source testing for metals** |  |  |
| Required source (stack) testing for total chromium and chromium VI. Two stack testing options were given. | Tier 1 CAGMs (smaller) only have to test for metals if they wish to use the exemption from the requirement to install emission control devices.  Tier 2 CAGMs must source test for total chromium and chromium VI. Two stack testing options reduced to one and revised. | See (6) below for more details |
| **Dispersion modeling** |  |  |
| Required dispersion modeling using source test results to determine maximum allowable chromium III and chromium VI usage rates. | Tier 1 CAGMs (smaller) are not required to perform dispersion modeling; DEQ dispersion modeling was used to establish exemption levels.  Tier 2 CAGMs are required to perform dispersion modeling using source test results to determine maximum allowable chromium III and chromium VI usage rates. | See (7) below for more details |
| **Source testing for particulate matter (PM)** |  |  |
| Testing for PM required at inlet and outlet of emission control devices to establish removal efficiency. | Testing for PM required at inlet and outlet of at least one emission control device to establish removal efficiency. | See (8) below for more details |
| **Maximum allowed ambient impact** |  |  |
| Proposed a maximum allowable ambient concentration of chromium VI at 1.6 ng/m3 (20 times the Ambient Benchmark Concentration). CAGM emissions, plus background concentration, could not exceed this level. | Proposes a maximum acceptable source impact level for all 6 metals. Acceptable source impact level is set at the Ambient Benchmark Concentration for 5 of the metals, and at 1/10th of the Ambient Benchmark Concentration for lead. | See (9) below for more details |

1. **Treatment of CAGMs**

There are significant differences between the two larger CAGMs and the three smaller CAGMs. These differences are:

|  |  |  |
| --- | --- | --- |
|  | Tier 1 CAGMs (smaller) | Tier 2 CAGMs (larger) |
| Glass production | 30 to 55 tons per year | 450 to 2,200 tons per year |
| Furnace heat | Electric | Fuel |
| Furnace venting | Furnaces vent into the workspace, fumes are then draw into fume hoods that vent to atmosphere | Direct to atmosphere through stacks |

The largest of the Tier 1 CAGMs (Northstar Glassworks) produces 1/40th as much glass as the largest of the Tier 2 CAGMs (Bullseye Glass). Based on production, DEQ expects the ambient impact of Tier 1 CAGMs to be 1/40th as much, or less. The impact is further reduced by the fact that the Tier 1 CAGM furnaces vent into the workspace and then through fume hoods. The fume hoods will provide significant dilution, resulting in even lower concentrations in the exhaust and therefore lower ambient impacts.

1. **Cutoffs for rule applicability**

The proposed rule does not apply to glass-making facilities that produce less than 10 tons of glass per year. This amount is 1/220th of the amount of glass made by Bullseye, and DEQ expects that the ambient impact of such facilities would be approximately 1/220th as much as the impact of Bullseye or less, depending on actual production and furnace type. Based on the October ambient monitoring results, cadmium levels were almost 50 times the ambient benchmark concentration and arsenic levels were almost 160 times the ABC. DEQ chose 10 tons per year of glass as the cutoff for rule applicability because glass-making furnaces this size are not expected to cause ambient concentrations that exceed the ABCs.

A very large CAGM using only electric furnaces could have emissions that would have significant ambient impacts. DEQ therefore proposes an upper size cutoff of 100 tons per year for the Tier 1 facilities. Other cutoff levels could have been chosen, but DEQ did not have time to examine the question in detail. DEQ therefore chose the relatively low value of 100 tons per year as the upper cutoff for Tier 1; larger CAGMs would fall into Tier 2.

1. **Emission control device requirements**

There are two significant differences in the April rule proposal with regard to emission control device requirements:

The requirement to install emission control devices now applies to furnaces that use any of six metals rather than four as in the March rule proposal. The March rule proposal did not include lead and manganese because the October ambient concentrations of these metals were below their respective ABCs. DEQ was guided in this decision to include lead and manganese by EPA’s area source NESHAP for Glass Manufacturing, 40 CFR Part 63, Subpart SSSSSS (6S), which regulated the same six metals. DEQ also concluded that extending the rule applicability to all six metals would provide for additional reductions to help ensure that ambient concentrations of lead and manganese would not become problems in the future.

The Tier 1 CAGMs have an option of installing emission control devices, or showing that they meet an exemption from the emission control device requirement, or requesting permit limits that prohibit the use of certain metals. In considering the Tier 1 CAGMs, DEQ concluded that they are much less likely to have unacceptable ambient impacts; however, DEQ has no emissions data that could be used to show that they should be, or should not be, required to install emission control devices. DEQ therefore provided an opportunity for Tier 1 CAGMs to show that the emissions from individual furnaces or groups of furnaces would not cause ambient impacts over the acceptable source impact levels, and if such a showing can be made, then the Tier 1 CAGM would not have to install an emission control device on that furnace or group of furnaces. DEQ also learned that the Tier 1 CAGMs do not use all six of the metals addressed in the proposed temporary rule, and may only three or four of them. DEQ is also proposing that Tier 1 CAGMs may request permit conditions that prohibit the use of certain metals in a furnace or group of furnaces in lieu of installing emission control devices.

1. **Chromium III usage**

Both the March and April proposed rules prohibit the use of chromium III in uncontrolled furnaces until DEQ has established maximum chromium III usage rates. To establish the maximum usage rates, the CAGM must perform source testing to show whether or not chromium III converts to chromium VI in the furnace, and if so, how much is emitted. Based on the test results and dispersion modeling, DEQ proposes to establish maximum chromium III usage rates that will ensure that the acceptable source impact level is not exceeded.

1. **Chromium VI usage**

Both the March and April proposed rules prohibit the use of chromium VI in uncontrolled furnaces. DEQ has no information on how much chromium VI stays in that form when emitted. To be protective, DEQ assumes that 100 percent of the chromium emissions from the use of chromium VI are in the form of chromium VI. If and when information becomes available, DEQ may change this assumption, but for the purpose of the proposed rules, DEQ proposes to err on the side of protection and require emission control devices for furnaces that use chromium VI.

1. **Source testing for metals**

In the March rule proposal, all CAGMs were required to perform source testing for total chromium and chromium VI. Two stack testing options were given.

In the April rule proposal, Tier 1 CAGMs only have to test for metals if they wish to use the emission control device exemption.

Tier 2 CAGMs must source test for total chromium and chromium VI. The two original stack testing options were reduced to one and revised to eliminate the need to clean the exhaust stack.

1. **Dispersion modeling**

In the March proposed rules, dispersion modeling for chromium VI related to chromium III usage was required for all CAGMs.

In the current proposed rules, ?????????????????????????????

1. **Source testing for particulate matter (PM)**

In both the March and April rule proposals, at least one emission control device must be tested at the inlet and outlet for PM. The purpose of this testing is to establish the control, or reduction, efficiency of the emission control device. The tested PM control efficiency will be used as the control efficiency of all of the metals. Some concern has been expressed that baghouses cannot effectively control metals if they are in the vapor state. DEQ has concluded that metals will condense into a particulate state because of the inlet temperature requirements of a baghouse and will therefore be controlled at the same efficiency as other PM.

1. **Maximum allowed ambient impact**

The March rule proposal included a maximum allowable ambient concentration of chromium VI at 1.6 ng/m3 (20 times the ABC). CAGM emissions, plus background concentration, could not exceed this level on a two-week average basis. The two-week average basis was chosen in part because the DEQ ambient monitoring data become available on a roughly weekly to bi-weekly schedule, and in part because health protective levels relate to single day concentrations (acute effects), single day to two week average concentrations (intermediate effects), and annual concentrations (chronic effects). Both DEQ and OHA felt that the intermediate time frame was appropriate.

The following explanation of the current proposed approach was taken from the Response to Comments document:

DEQ has reconsidered the approach to chromium VI in the original proposed rules, and also considered the approach to other metals when proposing the emission control device exemption option for the Tier 1 CAGMs. Ambient concentrations of a metal result from many possible sources, some natural such as rock and soil erosion, and some anthropogenic. All of these possible sources create the ambient concentration of the metal, which is considered the “background” concentration. The emissions from a single facility add to this background. Hopefully, though not always, the background concentration is below the concentration that is considered acceptable. The difference between the background concentration and the acceptable ambient concentration then provides a margin for the increased concentration that may result from a facility’s emissions. This concept is illustrated below:

\_\_\_\_\_\_\_\_\_\_ Acceptable ambient concentration

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Margin

…v……….. Background concentration

\_ \_ \_ \_ \_ \_ Zero concentration

Acceptable ambient concentrations are a human-health risk-based concentration of pollutants in the air; they are used as a protective goal that ideally should not be exceeded. When background concentrations are below the acceptable level it does not make sense to use the entire remaining margin as the total allowable impact from one facility because there are multiple sources that contribute to the acceptable ambient concentration. Instead, to be protective, a fraction of the margin is used for each facility; this fraction establishes the acceptable source impact level.

When background concentrations are above the acceptable ambient concentration it doesn’t mean that there should be a ban on economic growth. It means that there are likely other sources of the emissions, and even if emissions from the source in question were completely eliminated, the ambient concentration would still exceed the acceptable level. In this situation, a single source should not be prevented from operating while other sources are allowed to continue. Instead, emissions from all sources affecting the area should be assessed and reduced, if possible, to minimize the total impact. The contribution from the source in question should also be held down to an acceptable level, which may be the same as the acceptable source impact level discussed in the preceding paragraph.

For the purpose of the April proposed temporary rule, DEQ finds that it is necessary to propose acceptable source impact levels for the HAP metals emitted by the CAGMs. DEQ stresses that the proposed acceptable source impact levels does not represent a recommendation to use the same approach or for the statewide risk-based rules.

Ambient Benchmark Concentrations (ABCs) are not mandatory maximum allowed ambient concentrations; rather, they are goals to be used for program planning purposes. The ABCs are based on one in a million additional cancer risk for carcinogens and a non-cancer hazard quotient of one. DEQ cannot predict whether the same levels will be recommended for the statewide risk-based rules, and other regulatory programs around the nation use other levels ranging from one in ten thousand to one in ten million for cancer risk.

DEQ’s goal at this time is to be protective while at the same time being clear that any maximum source impact levels used for this proposed temporary rule do not represent a recommendation to use the same levels in the statewide risk-based rules.

DEQ proposes to establish both annual and daily (24-hour) acceptable source impact levels.

DEQ proposes to use the ABCs, which are annual average values, as the annual acceptable source impact levels for each metal addressed in the proposed rules (except lead, see below). This means that emissions from a source that uses all six of the metals addressed in the rules might create an additional cancer risk that is greater than one in a million but less than six in a million (not all of the six metals are carcinogens), which is within the range of acceptable risk levels referred to above (i.e., one in ten thousand to one in ten million). The proposed acceptable source impact levels are not emission limits; rather, they are ambient concentrations, and when required, DEQ expects that any emissions limits needed to meet the acceptable source impact levels will be determined through dispersion modeling.

Lead is a unique case because the ABC is also the National Ambient Air Quality Standard. A National Ambient Air Quality Standard is a level that is not to be exceeded by all facilities in an airshed (?), so it is not appropriate to use this as the acceptable source impact level. DEQ therefore proposes to use 1/10th of the ABC, or 15 ng/m3, as the acceptable source impact level. As with the other acceptable source impact levels, this does not represent a recommendation to use this approach in the statewide risk-based rules.

DEQ proposes to use the Oregon 24-Hour Screening levels as the daily acceptable source impact levels for each metal addressed in the proposed rules. These screening levels, developed by other municipalities, were selected by toxicologists at OHA and DEQ because they are designed to be compared against 24-hour samples. They are also based on health endpoints other than cancer, which is important because there is too much uncertainty about the impact of a 24-hour exposure to cancer risk over the course of a lifetime. To establish this list, OHA and DEQ toxicologists chose the lowest from among: 24-hour Ambient Air Limit from New Hampshire’s Code of Administrative Rules, Ontario’s Ministry of the Environment 24-hour Ambient Air Quality Criteria (AAQC), short-term Environmental Screening Level (ESL) developed by the Texas Commission of Environmental Quality, or the Agency for Toxic Substances and Disease Registry’s (ATSDR) Acute Minimal Risk Level (MRL). As with the other acceptable source impact levels, this does not represent a recommendation to use this approach in the statewide risk-based rules. For the purpose of the proposed rules, only the chromium VI of 36 ng/m3 Oregon 24-hour Screening level is used.