DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR EMISSIONS AGREEMENT

RECITALS:

1. Uroboros Glass Studios, Inc. (Uroboros) owns and operates a glass manufacturing facility located at 2139 N. Kerby Avenue, Portland, Oregon, 97227 (the Facility).

a. The Facility commenced operations at its current location in 1984.

b. The Facility currently employs approximately 34 people.

c. Typically, the Facility used the following elements in the production of glass: cadmium, chromium III, chromium VI, lead, manganese, and nickel. Uroboros has not used arsenic for at least 20 years and does not currently.

d. Following a request by DEQ, Uroboros voluntarily suspended the use of cadmium.

e. On February 11, 2016, DEQ requested that Uroboros suspend use of chromium as a raw material in its production of glass at the Facility.

f. On February 12, 2016, Uroboros agreed to suspend use of chromium at its Facility.

g. Uroboros has continued to operate without the use of cadmium and chromium as of the date of this executed agreement.

2. The Oregon Health Authority has reviewed the ambient concentration levels used in this agreement for chromium VI and nickel and has determined that they are protective.

3. DEQ and Uroboros enter into this agreement during an interim period prior to the development of new air toxics regulations.

NOW THEREFORE, it is stipulated and agreed that:

4. The recitals described above are incorporated into this agreement.

5. For the purpose of this agreement, the following terms will have the given meanings:

a. "Chromium III" means chromium in the +3 oxidation state, also known as trivalent chromium;

b. "Chromium VI" means chromium in the +6 oxidation state, also known as hexavalent chromium;

c. "Chromium", without a following roman numeral, means chromium in any

oxidation state;

d. "Controlled" means the glass-making furnace emissions are treated by an emission control device approved by DEQ;

e. "Cullet" means recycled glass that is mixed with raw materials and charged to glass melting furnace to produce glass. Cullet is not considered to be a raw material for the purposes of this agreement;

f. "Raw material" means minerals, such as silica sand, limestone, and dolomite; inorganic chemical compounds, such as soda ash (sodium carbonate), salt cake (sodium sulfate), and potash (potassium carbonate); metal oxides and other metal-based compounds, such as lead oxide, chromium oxide, and sodium antimonate; metal ores, such as chromite and pyrolusite; and other substances that are intentionally added to a glass manufacturing batch and melted in glass melting furnace to produce glass. Metals that are naturally-occurring trace constituents or contaminants of other substances are not considered to be raw materials. Cullet and material that is recovered from a furnace control device for recycling into the glass formulation are not considered to be raw materials for the purposes of this agreement;

g. "Uncontrolled" means the glass-making furnace emissions are not treated by an emission control device approved by DEQ; and

h. "Week" means Sunday through Saturday.

6. No later than September 1, 2016:

a. Uroboros must install one or more emission control devices to control all glass-making furnaces that use raw material containing any of the following metals: arsenic, cadmium, chromium or nickel; and

b. Each emission control device must meet either of the following requirements: 99.0% removal efficiency for particulate matter as measured by DEQ Method 5 or 0.2 pounds of particulate matter per ton of glass produced as measured by EPA Method 5.

7. Uroboros must not use arsenic, cadmium or chromium VI in raw materials in any glass-making furnace that is not controlled by an emission control device approved by DEQ.

8. Uroboros must comply with either paragraph 9 (Option 1) or paragraph 10 (Option 2), and may comply with both but is not required to comply with both.

9. Option 1: Uroboros must not use chromium III in uncontrolled glass-making furnaces until DEQ establishes a maximum allowable chromium III usage rate for uncontrolled

glass-making furnaces that will not result in ambient concentrations that exceed 1.6 ng/m^3 of chromium VI. Thereafter, Uroboros must comply with the maximum allowable chromium III usage rate for uncontrolled glass-making furnaces established by DEQ. For the purpose of establishing a maximum allowable chromium III usage rate, the following are required:

a. Performing a source test in an uncontrolled furnace or at the inlet of an emission control device as specified below:

i. Test using DEQ approved protocols and methods for total chromium and chromium VI and submit a source test plan detailing the approach to DEQ for approval;

ii. Test while making a glass that DEQ agrees is made under the most oxidizing combustion conditions and that contains a high percentage of chromium III as compared to other formulas used by Uroboros;

iii. Keep records of the amount of chromium III used in the batches that are produced during the source test runs, as well as other operational parameters identified in the source test plan; and

iv. Prior to the source test, clean the furnace stack in a manner that has been approved by DEQ and complies with applicable OSHA standards, or replace the furnace stack to be tested.

b. Performing dispersion modeling to determine the ambient concentrations of Uroboros's air emissions at nearby and adjacent receptors as follows:

i. Submit a modeling protocol for approval by DEQ;

ii. Use the maximum chromium VI emission rate;

iii. Determine the impact at receptors approved by DEQ; and

iv. Establish a maximum chromium III usage so as not to exceed an ambient concentration of 1.6 ng/m^3 of chromium VI.

c. Uroboros must keep daily records of all batches produced and provide to DEQ, each week, the daily amount of DEQ monitored metals used.

10. Option 2: Uroboros must not use chromium III in controlled or uncontrolled glass-making furnaces until DEQ establishes maximum allowable chromium III usage rates for uncontrolled or controlled glass-making furnaces that will not result in ambient concentrations that exceed 1.6 ng/m^3 of chromium VI. Thereafter, Uroboros must comply with the maximum

allowable chromium III usage rates for uncontrolled or controlled glass-making furnaces established by DEQ. For the purpose of establishing maximum allowable chromium III usage rates, the following are required:

a. Performing a source test as specified below:

i. Test using DEQ approved protocols and methods for total chromium, chromium VI, and particulate matter (DEQ Method 5) and submit a source test plan detailing the approach to DEQ for approval;

ii. Test for chromium and chromium VI at the outlet of the emission control device, and test for particulate matter at both the inlet and the outlet of the emission control device;

iii. Test while making a glass that DEQ agrees is made under the most oxidizing combustion conditions and that contains a high percentage of chromium III as compared to other formulas used by Uroboros;

iv. Keep records of the amount of chromium III used in the batches that are produced during the source test runs, as well as other operational parameters identified in the source test plan; and

b. Performing dispersion modeling to determine the ambient concentrations of Uroboros's air emissions at nearby and adjacent receptors as follows:

i. Submit a modeling protocol for approval by DEQ;

ii. Use the maximum chromium VI emission rate;

iii. Determine the impact at receptors approved by DEQ; and

iv. Establish a maximum chromium III usage so as not to exceed an ambient concentration of 1.6 ng/m^3 of chromium VI.

c. Uroboros must keep daily records of all batches produced and provide to DEQ, each week, the daily amount of DEQ monitored metals used.

11. Uroboros may apply source testing protocols equivalent to those in paragraph 10 to the use of chromium VI in a glass-making furnace to establish maximum usage rates for chromium VI in controlled glass-making furnaces that will not result in ambient concentrations that exceed 1.6 ng/m^3 of chromium VI.

12. Uroboros must limit the use of nickel in Table 1 in raw materials as follows:

a. This limitation applies to all glass-making furnaces that are not controlled

by an emission control device approved by DEQ;

b. In any week, Uroboros must use no more than the listed Maximum Weekly Usage for nickel in raw materials;

i. This limitation applies to the total usage of nickel in raw materials in all glass-making furnaces that are not controlled by an emission control device approved by DEQ; and

ii. This limitation applies to the weight of nickel itself in raw materials, not the weight of the compounds that contain nickel.

c. Uroboros must reduce or stop use of nickel in raw materials as provided in paragraph 13.

Table 1

	Action Levels*			80%	60%	40%
Metal	**Reduce Use Level (ng/m^3)**	**Stop Use Level (ng/m^3)**	**Maximum Weekly Usage, pounds per week**	**Reduction Step 1, pounds per week**	**Reduction Step 2, pounds per week**	**Reduction Step 3, pounds per week**
Nickel [1]	40	80	10	8	6	4

[1] The ABC of 4 ng/m3 for nickel refinery dust is based on a cancer risk of one potential occurrence of cancer in a population of 1 million people (1×10^{-6}). The Stop Use Level for nickel is 20 times the ABC, which is related to a cancer risk of 20 potential occurrences of cancer in a population of 1 million people (2×10^{-5}). The Reduce Use Level is 10 times the ABC, which is related to 10 potential occurrences of cancer in a population of 1 million people (1×10^{-5}).

*The ranges listed in Table 1 have been reviewed by and are acceptable to the Oregon Health Authority as protective.

13. Prior to installation of all emission control devices required in Paragraph 6, in the event that rolling bi-weekly averages of ambient monitoring data exceed an Action Level listed in Table 1, Uroboros must reduce or stop usage of nickel as specified below:

a. For the purpose of this paragraph, the following apply:

i. The term "Monitored Level" means the rolling bi-weekly average of the ambient monitoring data of nickel listed in Table 1 from monitors located within 0.4 mile radius of the Facility;

ii. The rolling bi-weekly average will be based on the most recent two weeks of monitoring; and

iii. The minimum data set required to calculate a rolling bi-weekly

average must have at least five daily values for each week.

b. If the Monitored Level of nickel exceeds the Reduce Use Level in Table 1, Uroboros must reduce the use of nickel in raw materials in uncontrolled glass-making furnaces to Reduction Step 1 upon being notified to do so by DEQ. The requirement to reduce usage applies to the week following the week in which notification was given.

c. If a second consecutive Monitored Level of nickel exceeds the Reduce Use Level in Table 1, Uroboros must reduce the use of nickel in raw materials in uncontrolled glass-making furnaces to Reduction Step 2 upon being notified to do so by DEQ. The requirement to reduce usage applies to the week following the week in which notification was given.

d. If a third consecutive Monitored Level of nickel exceeds the Reduce Use Level in Table 1, Uroboros must reduce the use of nickel in raw materials in uncontrolled glass-making furnaces to Reduction Step 3 upon being notified to do so by DEQ. The requirement to reduce usage applies to the week following the week in which notification was given and all following weeks until DEQ provides notification that the Monitored Level is again below the Reduce Use Level in Table 1.

e. If the Monitored Level of nickel exceeds the Stop Use Level in Table 1, Uroboros must stop using nickel in raw materials in uncontrolled glass-making furnaces upon being notified to do so by DEQ. The requirement to stop usage applies to the week following the week in which notification was given and all following weeks until DEQ provides notification that the Monitored Level is again below the Reduce Use Level in Table 1. In the event that DEQ requires Uroboros to stop using nickel in raw materials three times pursuant to this subparagraph, Uroboros must stop using nickel in raw materials in uncontrolled glass-making furnaces.

f. Following any requirement to reduce or stop usage of nickel in raw materials, Uroboros may resume usage of nickel in raw materials at the Maximum Weekly Usage level after DEQ provides notification that the Monitored Level of nickel is again below the Reduce Use Level. Uroboros may resume usage in the week following the week in which notification is given and all following weeks until Uroboros is required to reduce or stop usage again.

g. DEQ notifications will be provided no later than 12 PM on Friday and will affect the following week. Notification will be by email or facsimile and DEQ will attempt to confirm receipt by phone.

14. Uroboros must keep daily records of all batches produced and provide to DEQ

upon request, the daily amount of metals used.

15. On and after September 1, 2016 and provided DEQ does not notify Uroboros at least three times to stop using the metal in raw materials as described under Paragraph 13, Uroboros may continue to use nickel in uncontrolled glass-making furnaces as follows:

a. If DEQ did not notify Uroboros to reduce or stop using nickel, Uroboros must use no more than the listed Maximum Weekly Usage for nickel in raw materials without prior authorization from DEQ.

b. If DEQ notified Uroboros to stop or reduce using nickel, Uroboros will reduce the weekly usage of nickel in raw materials in uncontrolled glass-making furnaces to the appropriate Reduction Step in Table 1 as are in effect as of September 1, 2016 (if any) and Uroboros cannot increase the weekly usage of nickel without prior authorization from DEQ.

16. Emission control device requirements:

a. The design of all emission control devices must be approved by DEQ before installation.

b. Uroboros must submit a Notice of Intent to Construct in accordance with OAR 340-210-0205 through 340-210-0250 no later than 15 days prior to the date installation begins. If DEQ does not deny or approve the Notice of Intent to Construct within 10 days of receipt of the Notice, the Notice will be deemed to be approved.

c. Emission control devices may control emissions from more than one furnace.

d. Each emission control device must be equipped with the monitoring device or devices specified by DEQ in DEQ's approval of the Notice of Intent to Construct required in subparagraph b.

e. Each emission control device must be equipped with inlet ducting that provides the following:

i. Sufficient cooling of exhaust gases to no more than the maximum design inlet temperature under worst-case conditions; and

ii. Provision for inlet emissions testing, including sufficient duct diameter, sample ports, undisturbed flow conditions, and access for testing.

f. Each emission control device must be equipped with outlet ducting that provides for outlet emissions testing, including sufficient duct diameter, sample ports, undisturbed

flow conditions, and access for testing.

g. After commencing operation of any emission control device, Uroboros must observe and record the parameters specified by DEQ in DEQ's approval of the Notice of Intent to Construct, required in subparagraph b.

h. Uroboros must perform the following source testing on at least one controlled glass-making furnace approved by DEQ to demonstrate compliance with either requirement in Paragraph 6. Source testing done under paragraph 10 may be used in whole or in part to comply with this paragraph.

i. Within 60 days of commencing operation of the emission control devices, test control device inlet and outlet for particulate matter using DEQ Method 5 or comparable method;

ii. A source test plan must be submitted at least 30 days before conducting the source test; and

iii. The source test plan must be approved by DEQ before conducting the source test.

17. This agreement imposes no restrictions on the raw materials that may be used in glass-making furnaces that are controlled by an emission control device approved by DEQ, except that the use of chromium III and chromium VI will be subject to maximum usage rates determined by DEQ.

18. Notwithstanding this agreement, Uroboros will be subject to any rules adopted by the Environmental Quality Commission.

19. Upon receipt of a written DEQ finding that Uroboros has breached a provision of this agreement, Uroboros agrees to pay the following stipulated damages:

a. $1,600 for each day that Uroboros breaches any compliance requirement detailed in Paragraphs 6 and 7 of this agreement; and

b. $800 for each breach of any of the maximum weekly usage levels or reduction or stop levels in Table 1.

20. If any event occurs that is beyond Uroboros's reasonable control that causes or may cause a delay or deviation in performance of the requirements of this agreement, Uroboros must promptly notify DEQ verbally of the cause of delay or deviation and its anticipated duration, the measures that have been or will be taken to prevent or minimize the delay or deviation, and the

timetable by which Uroboros proposes to carry out such measures. Uroboros must confirm in writing this information within five (5) working days of the onset of the event. It is Uroboros's responsibility in the written notification to demonstrate to DEQ's satisfaction that the delay or deviation has been or will be caused by circumstances beyond the reasonable control and despite due diligence of Uroboros. If Uroboros so demonstrates, DEQ will extend times of performance of related activities under this agreement as appropriate. Circumstances or events beyond Uroboros's control include, but are not limited to, acts of nature, unforeseen strikes, work stoppages, fires, explosion, riot, sabotage, or war. Increased cost of performance or consultant's failure to provide timely reports will not be considered circumstances beyond Uroboros's reasonable control. However, delay in DEQ approval of documents due to no act or omission of Uroboros's will be considered circumstances beyond Uroboros's control.

21. Each party reserves the right to enforce this agreement through appropriate administrative and judicial proceedings.

22. DEQ and Uroboros may amend the terms of this agreement only by mutual written agreement.

23. Uroboros agrees that this agreement shall be binding on Uroboros and its respective successors, agents, and assigns. The undersigned representative of Uroboros certifies that he or she is fully authorized to execute and bind Uroboros to this agreement. No change in ownership or corporate or partnership status relating to the Facility will, in any way, alter Uroboros's obligation under this agreement, unless otherwise approved in writing by DEQ.

24. All reports, notices and other communications required under or relating to this agreement should be sent to: Air Quality Section Manager, DEQ Northwest Region Office, 700 NE Multnomah St., Suite 600, Portland, OR 97232. The contact person for Uroboros is: Eric Lovell, 2139 N. Kerby Avenue, Portland, Oregon 97227 and Leonard DuBoff, DuBoff Law Group, 6665 SW Hampton Street, #200, Portland, OR 97223.

25. Uroboros acknowledges that it has actual notice of the contents and requirements of this agreement and that failure to fulfill any of the requirements hereof will constitute a violation of this agreement and will subject Uroboros to payment of stipulated damages.

26. Any stipulated damages imposed pursuant to Paragraph 18 are due upon written demand. Stipulated damages must be paid by check or money order made payable to the "State Treasurer, State of Oregon" and sent to: Business Office, Department of Environmental Quality,

811 SW Sixth Avenue, Portland, Oregon 97204.

27. This agreement will terminate in 5 years of the date this agreement is fully executed, or upon issuance of a permit that incorporates the provisions of new air toxics regulations adopted by the Environmental Quality Commission, or at the mutual agreement of the parties, whichever is sooner, and on condition that Uroboros has paid all stipulated damages required by Paragraph 18.

28. Provided that Uroboros complies with the provisions of this agreement, DEQ agrees not to take enforcement action at this time related to Uroboros's emissions of metals in Table 1. Uroboros expressly denies that it is in violation of any emission standard.

29. This agreement is not intended to limit, in any way, DEQ's right to proceed against Uroboros in any forum for any past or future violations not expressly addressed herein, or any rights or defenses that Uroboros may raise in any such proceeding.

UROBOROS GLASS STUDIOS, INC.

3-14-16
Date

Signature

ERIC LOVELL
Name (print)

PRESIDENT
Title (print)

DEPARTMENT OF ENVIRONMENTAL QUALITY

3-14-16
Date

Joni Hammond, Deputy Director
on behalf of DEQ