Cardinal FG - Winlock

Title V Basis Statement

April 11, 2025

DRAFT

Southwest Clean Air Agency
5101 NE 82nd Ave, Suite 102
Vancouver, WA 98662
Telephone: (360) 574-3058

AIR OPERATING PERMIT:	SW08-14-R2
PLANT SITE:	545 Avery Road W Winlock, WA 98596
PERMIT ENGINEER:	Wess Safford, Air Quality Engineer
REVIEWED BY:	Clinton Lamoreaux, Chief Engineer Uri Papish, Executive Director

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I. GENERAL INFORMATION AND CERTIFICATION

Company Name	Cardinal FG
Facility Name	Cardinal FG - Winlock
Facility Address	545 Avery Road W Winlock, WA 98596
Mailing Address	545 Avery Road W Winlock, WA 98596
Parent Company/Address	Cardinal Glass Industries 311 E Wisconsin Street Portage, WI 53901
Unified Business Identification	602082179
Standard Industrial Classification	3211
North American Industrial ..... Classification System	327211
Responsible Official	Steven Smith, Plant Manager
Basis for Title V Applicability	Major source of regulated emissions as defined in WAC 173-401-200(19). Potential emissions of NO_X, CO, SO_2, and PM are greater than 100 tpy.

Facility-wide Potential To Emit Summary

Pollutant	Emissions (tpy)*
Nitrogen oxides	249.49
Carbon monoxide	249.73
Volatile organic compounds	57.79
Sulfur dioxide	114.21
Lead	0.04
Particulate Matter	141.95
Particulate Matter (<10 micron)	141.95
Particulate Matter (<2.5 micron)	141.95
Combined HAPs	3.43
Ammonia	9.58
CO_2 equivalent	163,864

* Potential emission values are taken from Technical Support Document for ADP 23-3596.

Current Permitting Action:
The purpose of the current permitting action is to renew the Air Operating Permit (AOP) for this facility. Cardinal FG has made significant changes to facility equipment since the last Title V Permit was issued. This AOP has been updated as appropriate to reflect the issuance of ADP 23-3596 and the rescinding of PSD-03-03-A2.

AOP SW08-14-R2 (renewal)

1. Permit Application Due:	July 22, 2023
2. Permit Application Submitted:	February 7, 2023
3. Permit Application Deemed Complete:	February 8, 2023
4. Permit Application Sent to EPA:	February 8, 2023
5. Draft Permit Issued:	April 11, 2025
6. Proposed Permit Issued:	*TBD*
7. Final Permit Issued:	*TBD*
8. Renewal Permit Application Due:	*TBD*
9. Permit Expiration:	*TBD*

Attainment Area:
Cardinal FG - Winlock is located in an area which is in attainment for all criteria pollutants.

Facility Description:
Cardinal FG - Winlock is a flat glass manufacturing facility located near the intersection of Avery Road and Highway 603 in Winlock, Washington. The facility is similar in design to other facilities operated by Cardinal FG in Wisconsin (Menomonie and Portage), Oklahoma (Durant) and North Carolina (Mooresville). All equipment at the facility operates in support of a single glass furnace. The facility uses both recycled cullet and raw minerals in its production process and makes only clear flat glass. The facility's glass furnace has a nominal production rating of 750 tons per day. The glass furnace commenced operation in September 2006.

II. EMISSION UNIT DESCRIPTIONS

EU #	Generating Equipment	Emission Control
EU1	Glass Furnace / Annealing Lehr	NO_X Selective Catalytic Reduction CO Combustion Controls VOC Combustion Controls SO_2 Spray Dryer Low-sulfur Fuel (Nat Gas) PM Electrostatic Precipitator
EU2	Glass Cutting Operations	VOC Restriction on Material Type and Use
EU3	Cullet Return System #1	PM Process Enclosure, Fabric Filtration
EU4	Cullet Return System #2	PM Process Enclosure, Fabric Filtration
EU5	EP Dust Collection System #1	PM Process Enclosure, Fabric Filtration
EU6	EP Dust Collection System #2	PM Process Enclosure, Fabric Filtration
EU7	Emergency Generator #1	NO_X Combustion Controls CO Combustion Controls VOC Combustion Controls SO_2 Ultra-low-sulfur Fuel (Diesel ≤0.0015% by wt), PM Combustion Controls
EU8	Emergency Generator #2	NO_X Combustion Controls CO Combustion Controls VOC Combustion Controls SO_2 Ultra-low-sulfur Fuel (Diesel ≤ 0.0015% by wt), PM Combustion Controls
EU9	Misc. Burners/Space Heaters	NO_X Combustion Controls CO Combustion Controls SO_2 Low-sulfur Fuel (Nat Gas) PM Combustion Controls
EU10	Hydrogen Generation System	NO_X Combustion Controls CO Combustion Controls SO_2 Low-sulfur Fuel (Nat Gas) PM Combustion Controls

EU1 Glass Furnace

The Glass Furnace is a site-built float furnace with a side port, multi-cell regenerative configuration. The Glass Furnace operates in conjunction with a dedicated annealing lehr. First glass pull from the furnace occurred on September 26, 2006. The furnace was partially rebricked in February/March 2019.

Emissions from the Glass Furnace consist of NO_X, CO, VOC, SO_2, PM, HAPs, and TAPs. Emissions are controlled as follows:

- NO_X emissions are controlled by a selective catalytic reduction (SCR) system. The SCR system is guaranteed by the manufacturer to reduce NO_X emissions by a minimum of 80%. Installation of the SCR system was a voluntary action by Cardinal and is not considered to be a BACT measure. The SCR system is configured with a direct-fired heater in the exhaust ductwork between the ESP and the SCR system to reheat the exhaust stream to the minimum temperature required by SCR system.
- CO and VOC emissions are minimized through the use of proper combustion control without the use of add-on control equipment.
- SO_2 emissions from the glass furnace are controlled by raw material selection and a spray dryer utilizing an aqueous sodium carbonate solution. The spray dryer system is capable of limiting SO_2 emissions to a maximum of 0.8 lb/ton_g (30-day avg).
- PM emissions (filterable) are controlled with a four field electrostatic precipitator (ESP). The ESP is capable of limiting filterable PM emissions to a maximum of 0.45 lb/ton_g (1-hr avg).

Glass Furnace

Make/Model:	Site-built
Rated Heat Input:	231.0 MMBtu/hr
Capacity:	750 tpd
Fuel:	Natural gas
Exhaust:	8' dia vertical stack at ~175' above ground level

Electrostatic Precipitator

ESP Make:	United McGill

Exhaust Reheater

Make/Model:	Maxon / Kinedizer LE
Rated Heat Input:	19.2 MMBtu/hr (nominal)
Fuel:	Natural gas
Exhaust:	Exhausted through furnace exhaust stack

Annealing Lehr

One site-built annealing lehr with direct SO_2 injection. The annealing lehr does not have an independent exhaust stack. Exhaust streams from the lehr are vented to a collection hood that discharges to the Glass Furnace combustion air header.

Approval requirements allow by-pass of the ESP/Spray Dryer and SCR systems for purposes of maintenance for up to 120 hours per year. Maintenance of each system may be conducted independently. The exhaust ductwork configuration allows for by-pass of either system individually.

The Glass Furnace is subject to applicable requirements found in 40 CFR 60 Subpart CC. The Glass Furnace is not subject to any requirements from 40 CFR Parts 61 or 63.

EU2 Glass Cutting Operations

Multiple computer-controlled cutting wheel assemblies are used on the main production line to size and trim product by scoring the glass ribbon into lites. Mineral spirits are used as a cutting lubricant.

Emissions from Glass Cutting Operations consist of VOC and HAP/TAP. Emissions are controlled as follows:

- VOC emissions are minimized through the use of good work practices.
- HAP/TAP emissions are minimized by material content limits.

Glass Cutting Operations are not subject to any requirements from 40 CFR Parts 60, 61 or 63.

EU3 Cullet Return System #1

Cullet Return System #1 collects and conveys broken/reject lites and glass dust from the primary production line back to the cullet flat storage area at a maximum rate of 750 tpd.

Emissions from Cullet Return System #1 consist of PM. Emissions are controlled as follows:

- Filterable PM emissions are controlled with process enclosure and Cullet Return Baghouse #1.

Mfg / Model:	Donaldson / 324MBWS10
Rated Airflow:	41,500 acfm
Filtration Area / Media:	5,196 ft^2 of 10.5 oz/yd^2 Dura-Life Polyester
Cleaning System:	Reverse Pulse-jet
Exhaust Configuration:	34" dia exhaust discharging vertical at 100' above grade

Cullet Return System #1 is not subject to any requirements from 40 CFR Parts 60, 61 or 63.

EU4 Cullet Return System #2

Cullet Return System #2 collects and conveys broken/reject glass and glass dust from lite packing lines approved in ADP 04-2568R2.

Emissions from Cullet Return System #2 consist of PM. Emissions are controlled as follows:

- Filterable PM emissions are controlled with process enclosure and Cullet Return Baghouse #2.

Mfg / Model:	Carothers and Son / 195TR10HEI
Rated Airflow:	25,000 acfm
Filtration Area / Media:	3,120 ft^2 of 16 oz/yd^2 polyester
Cleaning System:	Reverse Airjet
Exhaust Configuration:	32" dia exhaust discharging vertical at 32’ 6" above grade

Cullet Return System #2 is not subject to any requirements from 40 CFR Parts 60, 61 or 63.

EU5 EP Dust Collection System #1

A pneumatic transfer system is used to convey material catch from the Glass Furnace ESP to the raw material storage silos.

Emissions from EP Dust Collection System #1 consist of PM. Emissions are controlled as follows:

- Filterable PM emissions are controlled with process enclosure and EP Dust Baghouse #1.

Mfg / Model:	Nol-Tec / 238-84NT25
Rated Airflow:	1,500 acfm
Filtration Media:	263 ft^2 of 16 oz/yd^2 polyester
Cleaning System:	Reverse Airjet
Exhaust Configuration:	8" dia exhaust discharging ~100' above grade

EP Dust Collection System #1 is not subject to any requirements from 40 CFR Parts 60, 61 or 63.

EU6 EP Dust Collection System #2

A pneumatic transfer system is used to convey material catch from the Glass Furnace ESP to the raw material storage silos.

Emissions from EP Dust Collection System #2 consist of PM. Emissions are controlled as follows:

- Filterable PM emissions are controlled with process enclosure and EP Dust Baghouse #2.

Mfg / Model:	Nol-Tec / 238-84NT25
Rated Airflow:	1,500 acfm
Filtration Media:	263 ft^2 of 16 oz/yd^2 polyester
Cleaning System:	Reverse Airjet
Exhaust Configuration:	8" dia exhaust discharging ~100' above grade

EP Dust Collection System #2 is not subject to any requirements from 40 CFR Parts 60, 61 or 63.

EU7 Emergency Generator #1

Emergency Generator #1 is a diesel engine driven package generator used to provide electricity to essential systems during interruptions in utility power.

Emissions from Emergency Generator #1 consist of NO_X, CO, VOC, SO_2, and PM. Emissions are controlled as follows:

- SO_2 emissions are minimized through the use of ultra-low sulfur diesel fuel.
- All other emissions are minimized through combustion controls.

Engine Make / Model:	Caterpillar / D3516 (s/n GZS00700)
Engine Power Rating:	2,885 bhp
Engine Fuel Consumption:	146.6 gal/hr (100% load)
Engine Mfg Date:	2005 (EPA Tier 1)
Generator Make / Model:	Caterpillar (s/n 1HN00940)
Generator Power Rating:	2,000 kW
Exhaust Configuration:	16.5" dia exhaust discharging 58' above grade

Emergency Generator #1 is subject to applicable requirements found in 40 CFR 63 Subpart ZZZZ (*existing compression ignition RICE*). This emission unit is not subject to any requirements from 40 CFR Parts 60 or 61.

EU8 Emergency Generator #2

Emergency Generator #2 is a diesel engine driven package generator used to provide electricity to essential systems during interruptions in utility power.

Emissions from Emergency Generator #2 consist of NO_X, CO, VOC, SO_2, and PM. Emissions are controlled as follows:

- SO_2 emissions are minimized through the use of ultra-low sulfur diesel fuel.
- All other emissions are minimized through combustion controls.

Engine Make / Model:	Caterpillar / 3516C (s/n ??)
Engine Power Rating:	2,937 bhp
Engine Fuel Consumption:	133.6 gal/hr (100% load)
Engine Mfg Date:	October 2022 (EPA Tier 2)
Generator Make / Model:	Caterpillar
Generator Power Rating:	2,000 kW
Exhaust Configuration:	16.5" dia exhaust discharging 58' above grade

Emergency Generator #2 is subject to applicable requirements found in 40 CFR 60, Subpart IIII and 40 CFR 63 Subpart ZZZZ (*new compression ignition RICE*). This emission unit is not subject to any requirements from 40 CFR Part 61.

EU9 Miscellaneous Burners / Space Heaters

A collection of natural gas fired maintenance burners, minor process heaters and air makeup heaters are operated in support of general glass production operations. Combined rated heat input for all equipment is 19.188 MMBtu/hr. Individual pieces of equipment are described below.

Emissions from Miscellaneous Burners / Space Heaters consist of NO_X, CO, SO_2, PM, VOC, HAPs, and TAPs. Emissions are controlled as follows:

- NO_X, CO, VOC, and PM emissions are minimized through the use of proper combustion controls.
- SO_2 emissions are minimized through the use of low-sulfur fuel (natural gas).

Facility Area	Unit Description	Unit Count	Unit Capacity (Btu/hr)
Cafeteria	Oven	1	70,000
	Range	1	191,000
	Charbroiler	1	50,000
	Griddle	1	80,000
	Fryers	2	180,000
Warehouse/Cold End	Unit Heater 2	22	250,000
	Rooftop Unit 11	1	120,000
Cold End Addition	HVAC-1 Heater/Cooler	1	80,000
	Unit Heater 1	1	100,000
Office	Rooftop Unit 4	1	80,000
	Rooftop Unit 5	1	120,000
	Rooftop Unit 6	1	120,000

Facility Area	Unit Description	Unit Count	Unit Capacity (Btu/hr)
	Rooftop Unit 7	1	60,000
	Rooftop Unit 8	1	80,000
	Rooftop Unit 9	1	60,000
	Rooftop Unit 10	1	150,000
	Rooftop Unit 12	1	60,000
	Water Heater 3	1	75,000
Shop/Utility Room	Rooftop Unit 3	1	120,000
	Unit Heater 6	1	250,000
	Unit Heater 5	3	175,000
Generator Room	Unit Heater 7	3	100,000
SO_2/Water Meter Building	Unit Heater 8	1	25,600
	Unit Heater 9	1	25,600
Hot End Control Room	Rooftop Unit 1	1	120,000
	Rooftop Unit 2	1	120,000
Batch House	Unit Heater 1st Floor	1	400,000
	Unit Heater 4LX60	2	200,000
Maintenance Heaters	Shotgun Burners	2	705,000
	Shotgun Burners	8	412,000
	Shotgun Burners	2	2,420,000

The Miscellaneous Burners / Space Heaters are not subject to any requirements from 40 CFR Parts 60, 61, or 63.

EU10 Hydrogen Generating System

One stand-alone packaged hydrogen generation system is used to produce hydrogen for use in the tin bath. The system converts pipeline natural gas into hydrogen using a steam methane reformer. Hydrogen produced by the system is mixed with nitrogen to create the necessary production atmosphere for the Glass Furnace tin bath.

Emissions from the Hydrogen Generating System consist of NO_X, CO, SO_2, PM, VOC. Emissions are controlled as follows:

- NO_X, CO, and PM emissions are minimized through the use of proper combustion controls.
- SO_2 emissions are minimized through the use of low-sulfur fuel (natural gas).

Make / Model:	Air Products / PHG100
Rated Heat Input:	0.85 MMBtu/hr
Fuel:	Natural gas
Exhaust:	18" dia vertical stack at 18' above ground level.

The Hydrogen Generating System is not subject to any requirements from 40 CFR Parts 60, 61, or 63.

Compliance Assurance Monitoring (CAM) Applicability

The CAM rule (40 CFR 64) requires facilities to monitor compliance indicators for emission units to provide reasonable assurance for compliance with regulatory emission limitations. When monitoring indicates the occurrence of a parameter excursion or exceedance, the facility is required to take corrective action to restore the monitoring parameter to the value range established as part of a source compliance or performance test. The facility is also required to document/report corrective actions, maintain monitoring records, and provide an annual certification of compliance to the delegated authority that administers the Title V operating permit program.

In accordance with 40 CFR 64.2, the CAM rule applies to Pollutant Specific Emission Units (PSEU) at major sources that are required to obtain a Part 70 or 71 permit and meet all of the following criteria:

1) The PSEU is subject to an emission limitation or standard for the applicable regulated air pollutant (or surrogate);
2) The PSEU uses a control device to achieve compliance with the emission limit or standard; and
3) The PSEU has potential pre-control device emissions of the applicable regulated pollutant equal to or above the major source threshold.

In accordance with 40 CFR 64.2(b), the following are exempt from requirements of the CAM rule:

1) Emission limitation or standards proposed by the Administrator after November 15, 1990, pursuant to section 111 and 112 of the Clean Air Act; and
2) Emission limitations or standards for which a part 70 or 71 permit specifies a continuous compliance determination method.

PSEU	Pollutant	CAM Applicable	Basis of Determination
EU-1 Glass Furnace / Annealing Lehr	NO_X SO_2 PM All Other	No No Yes No	Continuous emission monitor in use. Continuous emission monitor in use. Potential pre-control emissions greater than major source threshold. No emission control device in use.
EU-2 Glass Cutting Operations	VOC	No	No emission control device in use.
EU-3 Cullet Return System #1	PM	No	Potential pre-control emissions less than major source threshold.
EU-4 Cullet Return System #2	PM	No	Potential pre-control emissions less than major source threshold.
EU-5 EP Dust Collection System #1	PM	No	Potential pre-control emissions less than major source threshold.
EU-6 EP Dust Collection System #2	PM	No	Potential pre-control emissions less than major source threshold.

PSEU	Pollutant	CAM Applicable	Basis of Determination
EU-7 Emergency Generator #1	All	No	No emission control device in use.
EU-8 Emergency Generator #2	All	No	No emission control device in use.
EU-9 Misc. Burners / Space Heaters	All	No	No emission control device in use.
EU-10 Hydrogen Generation System	All	No	No emission control device in use.

III. EXPLANATION OF INSIGNIFICANT EMISSION UNIT DETERMINATIONS

Each emission unit listed as insignificant in the permit has been reviewed by SWCAA to confirm its status. Emission units were determined to be insignificant as follows:

IEU1 Bottom Material Elevator Dust Collectors

The bottom material elevator dust collectors have been determined to be insignificant emission units due to the configuration of their exhaust, which discharges inside the building envelope.

IEU2 Batch House Dust Collectors

The batch house dust collectors have been determined to be insignificant emission units due to the configuration of their exhaust, which discharges inside the building envelope.

IEU3 Cooling Tower

Primary cooling of process water at the facility takes place in a cooling tower located adjacent to the glass furnace building. The cooling tower is a categorically exempt insignificant emissions unit under WAC 173-401-532(121) because of processing exclusively non-contact cooling water. The cooling tower does not use chromium-based water treatment chemicals.

IV. EXPLANATION OF SELECTED PERMIT PROVISIONS AND GENERAL TERMS AND CONDITIONS

P11. Unavoidable Excess Emissions — SWCAA 400-107

SWCAA 400-107 establishes criteria and procedures for determining when excess emissions are considered unavoidable. Emissions that meet the requirements to be classified as unavoidable are still considered excess emissions and are reportable but are excused and not subject to penalty. Notification of excess emissions is required as soon as possible and shall occur by the next business day following the excess emissions event. Excess emissions due to process upsets are considered unavoidable if the Permittee adequately demonstrates the upset event was not caused by poor or inadequate design, operation, maintenance, or other reasonably preventable condition, and the Permittee takes appropriate corrective action that minimizes emissions during the event, taking into account the total emissions impact of that corrective action.

The provisions of SWCAA 400-107 do not apply to federal standards such as NESHAP/MACT standards. Such federal standards often have specific, and often more restrictive, affirmative defense provisions that only apply to malfunctions.

G1. Asbestos — 40 CFR 61 Subpart M; SWCAA 400-076

SWCAA has established a program to control asbestos emissions from the removal, salvage, disposal, or disturbance of asbestos-containing materials for the purpose of protecting public health. The program established under SWCAA 400-476 is intended to work in conjunction with the requirements of 40 CFR 61 Subpart M. Requirements of the program are applicable when triggered by asbestos related activities at the facility. Compliance with program requirements is assured via audits of asbestos program records and compliance certification by the responsible official.

G2. Chemical Accident Prevention — 40 CFR 68

40 CFR 68 requires affected facilities to develop risk management plans for the substances and thresholds listed in 40 CFR 68.130. None of the processes at this facility currently store or handle affected substances in quantities large enough to trigger applicability of the provisions in 40 CFR 68. The regulation has been included in the general terms of the permit in order to address future operations that may store or handle substances subject to the regulation.

The primary material of concern at this facility is ammonia, which is stored onsite for use in the SCR system of the Glass Furnace. Aqueous ammonia used at facility has an ammonia concentration ≤20%, which not an affected substance. Therefore, the regulation does not currently apply. Compliance with program requirements is assured via material certification.

G3. Protection of Stratospheric Ozone — 40 CFR 82 Subpart B; 40 CFR 82 Subpart F

The standards for recycling and emissions reduction provided in 40 CFR Part 82, Subparts B and F are intended to reduce emissions of class I and class II refrigerants and their non-exempt substitutes to the lowest achievable level by maximizing the recapture and recycling of such refrigerants during the maintenance, service, repair, and disposal of appliances and restricting the sale of refrigerants consisting in whole or in part of a class I or class II ozone-depleting substance or their non-exempt substitutes in accordance with Title VI of the Clean Air Act. Recycling and emission reduction standards are applicable when triggered by refrigerant handling activities at the facility. Compliance with program requirements is assured via audits of facility records and compliance certification by the responsible official.

G8. Permit Renewal **WAC 173-401-710(1)**

An AOP has an effective term of 5 years from the date of final issuance. Pursuant to WAC 173-401-710(1), the Permit specifies a date by which a renewal application is required to be submitted to SWCAA.

A preliminary renewal application for this facility must be submitted no later than 12 months prior to permit expiration. A complete renewal application must be received no later than 6 months prior to permit expiration. Early submittal of a preliminary application is intended to provide SWCAA with the opportunity to review the application for completeness and allow the Permittee sufficient time to amend the application, if necessary, prior to the final submission date.

G10. Reporting of Emissions of Greenhouse Gases **WAC 173-441**

WAC 173-441 requires owners and operators to quantify and report greenhouse gas emissions from applicable source categories if actual emissions from their facility are ten thousand metric tons CO_2e or more per year. Annual greenhouse gas emissions from this facility are greater than ten thousand tons so the facility is subject to the reporting program. The greenhouse gas reporting program is administered by Ecology, and all required reports are to be submitted directly to that agency. SWCAA receives a copy of each report, but report review and approval of calculation methodology is performed by Ecology. Compliance with program requirements is assured via audits of records submitted to Ecology and compliance certification by the responsible official.

G13. Portable Sources **SWCAA 400-036**
SWCAA 400-110(6)

SWCAA 400-110(6) establishes procedures for approving the operation of portable sources of air emissions that locate temporarily at project sites. These requirements are general statewide standards and apply to all portable sources of air contaminants. Common equipment subject to these conditions include emergency generators, engine-powered pumps, rock crushers, concrete batch plants, and hot mix asphalt plants that operate for a short time period at a site to fulfill the needs of a specific project. Portable sources exempt from registration under SWCAA 400-101 are also exempt from SWCAA 400-110 and not subject to the portable source requirements. Among those categories listed in SWCAA 400-101 that are exempt are operations with potential to emit less than 1 ton per year of all criteria pollutants other than $PM_{2.5}$ and less than 0.5 tons per year of $PM_{2.5}$.

G14. New Source Review **WAC 173-400-117 / WAC 173-400-720**
WAC 173-460 / SWCAA 400-072
SWCAA 400-076 / SWCAA 400-109
SWCAA 400-110 / SWCAA 400-820

Construction or modification of an air pollution source is subject to review to ensure that applicable emission standards are met and appropriate control technology is employed. The program under which a new source or modification is reviewed depends on the type and quantity of potential air emissions associated with the project. New sources or modifications meeting the definition of a 'major stationary source' and located in attainment or unclassified areas are subject to review under the Prevention of Significant Deterioration (PSD) program administered by the Department of Ecology. New sources or modifications meeting the definition of a 'major stationary source' and located in a nonattainment area and minor (area) sources are subject to review under SWCAA's new source review program. New sources or modification of existing sources that increase the emission of toxic air pollutants are subject to review under SWCAA's toxic air pollutant program, which implements the provisions of WAC 173-460.

G19. Outdoor Burning SWCAA 425

SWCAA has established a program to implement the limited burning policy authorized by sections 743 through 765 of the Washington Clean Air Act (Chapter 70A.15 RCW) and other provisions of the act that pertain to outdoor burning. The limited burning policy requires the Agency to reduce outdoor burning to the greatest extent practical, establish a permit program for limited burning that requires permits for most types of outdoor burning, and encourage development of reasonable alternatives to burning. Requirements of the program are applicable when open burning is conducted at the facility. Compliance with program requirements is assured via audits of burn program records and compliance certification by the responsible official.

V. EXPLANATION OF OPERATING TERMS AND CONDITIONS

Reqs 1-8 General Standards for Maximum Emissions SWCAA 400-040

Req 1 through Req 8 incorporate general maximum emission standards for various air contaminants established in SWCAA 400-040. These standards apply to all emission units at the source, both EU and IEU. Pursuant to WAC 401-530(2)(c), the permit does not contain any testing, monitoring, recordkeeping, or reporting requirements for affected IEUs except those specifically identified by the underlying requirements. General monitoring provisions have been created under 'gap-filling' to provide reasonable compliance assurance for general standards that do not specify a monitoring regime.

Req 9 Emission Standards for Combustion and Incineration Units SWCAA 400-050

Req 9 incorporates the particulate matter emission limit for combustion or incineration units established in SWCAA 400-050(1). This requirement applies to all combustion and incineration units at the source, both EUs and IEUs. Pursuant to WAC 401-530(2)(c), the permit does not contain any testing, monitoring, recordkeeping, or reporting requirements for affected IEUs except those specifically identified by the underlying requirements. General monitoring provisions have been created for EUs under 'gap-filling' to provide reasonable compliance assurance.

Req 10 Emission Standards for General Process Units SWCAA 400-060

Req 10 incorporates the particulate matter emission limit for general process units established in SWCAA 400-060. This requirement applies to all general process units at the source, both EUs and IEUs. Pursuant to WAC 401-530(2)(c), the Permit does not contain any testing, monitoring, recordkeeping, or reporting requirements for affected IEUs except those specifically identified by the underlying requirements. General monitoring provisions have been created for EUs under 'gap-filling' to provide reasonable compliance assurance.

Req 11 Emission Standards for Certain Source Categories SWCAA 400-070(8)
Abrasive Blasting

Req 11 incorporates general limitations and work practice requirements for abrasive blasting established in SWCAA 400-070(8). The limitations and requirements apply to any construction and/or maintenance activities at the facility that involve abrasive blasting. IEU3 is subject to these requirements, but consistent with WAC 401-530(2)(c), the permit does not contain any testing, monitoring, recordkeeping, or reporting requirements for the affected IEU except those specifically identified by the underlying requirements. General monitoring provisions have been created under 'gap-filling' to provide reasonable compliance assurance with applicable requirements.

Req 12 Operation of Pollution Control Devices ADP 23-3596 Condition 20

Req 12 incorporates a general permit requirement from ADP 23-3596. The intent of the requirement is to ensure approved control devices are properly maintained and operated. Compliance with this requirement is assured via compliance certification by the responsible official.

Req 13 Equipment Maintenance and Operation ADP 23-3596 Condition 21

Req 13 incorporates a general permit requirement from ADP 23-3596. The intent of the requirement is to ensure approved emission generating equipment is properly maintained and operated. Compliance with this requirement is assured via compliance certification by the responsible official.

Req 14 Source Testing Access and Sampling Ports ADP 23-3596 Condition 32

Req 14 incorporates a general permit requirement from ADP 23-3596. Permitted sources are required to provide safe access and proper sampling ports for each emission unit subject to emission testing requirements. Generally, safe access consists of permanent platforms and sampling ports that meet the requirements of 40 CFR, Part 60, Appendix A Method 1. Compliance with this requirement is assured via compliance certification by the responsible official.

Req 15 Good Air Pollution Control Practices 40 CFR 60.11(d)
SWCAA 400-115

Req 15 incorporates general work practice requirements from 40 CFR 60.11(d), which are applicable to the Glass Furnace. The Permittee is required to maintain and operate affected equipment in a manner that is consistent with good air pollution control practices to minimize emissions. Compliance with this requirement is assured via compliance certification by the responsible official.

Req 16 Glass Furnace Emission Limits ADP 23-3596 Condition 1

Req 16 incorporates emission limits from ADP 23-3596. The emission limits apply to criteria pollutants as well as HAP/TAP pollutants. All emission limits apply on a rolling 12-month basis. The emission limits for NO_X and CO are voluntary limits proposed by Cardinal for the purpose of limiting facility emissions to levels below major source thresholds. Emission limits for other pollutants are reflective of BACT (VOC, SO_2, PM_{10}) or emission data from similar sources (HAP/TAP). Compliance is assured by a combination of continuous emission monitoring, emission testing, recorded glass production, and emission factors.

Req 17 Glass Furnace Hourly/Performance Emission Limits 40 CFR 60.292(a), Table CC-1
ADP 23-3596 Condition 2

Req 17 incorporates criteria pollutant emission limits from ADP 23-3596 (lb/hr, lb/ton glass).

Pollutant	Emission Limit Basis	Control Measure	Compliance Assurance
NO_X	Voluntary Limit	SCR (≥80% Reduction)	Continuous Emission Monitoring
CO	Voluntary Limit	Proper Combustion Controls	Continuous Emission Monitoring
VOC	BACT	Proper Combustion Controls	Periodic Emission Testing
SO_2	BACT	Low Sulfur Fuel (Nat Gas) Spray Dryer System	Continuous Emission Monitoring
PM/PM_{10}	BACT 40 CFR 60 Subpart CC	Electrostatic Precipitator	Periodic Emission Testing CAM Plan

Emission standards/limits for NO_X and CO are voluntary limits proposed by Cardinal for the purpose of limiting facility emissions to levels below major source thresholds (PSD). The BACT emission standard for filterable PM/PM_{10} (0.45 lb/ton glass) is equal to the PM emission limit specified in 40 CFR 60 Subpart CC (Table CC-1 - 0.225 g PM/kg glass). The SO_2 spray dryer system uses a sodium carbonate solution to reduce emissions.

Req 18 Glass Furnace SCR Maintenance Emission Limit ADP 23-3596 Condition 3

Req 18 incorporates a NO_X emission limit from ADP 23-3596 (lb/hr). This limit is a short term limit applicable during maintenance periods when the SCR system is offline or by-passed. This limit is intended to maintain compliance with appliable NAAQS. Compliance with this requirement is assured by CEM data.

Req 19 Glass Furnace ESP/Spray Dryer Maintenance Emission Limits **ADP 23-3596 Condition 4**

Req 19 incorporates SO_2 and PM_{10} emission limits from ADP 23-3596 (lb/hr). These limits are short term limits applicable during maintenance periods when the electrostatic precipitator and/or spray dryer system are offline or by-passed. The limits are intended to maintain compliance with appliable NAAQS. Compliance with this requirement is assured by CEM data and emission test data.

Req 20 Glass Furnace Visible Emission Limits **ADP 23-3596 Condition 5**

Req 20 incorporates visible emissions limits from ADP 23-3596 (% opacity). Two visible emission limits are identified for the Glass Furnace. A limit of 10% opacity is applicable to routine operating periods. A higher limit of 20% opacity is allowed during periods of hot fan transition due to the potential for elevated opacity as shifting air flows disturb fine particulate deposited in the exhaust ductwork. Compliance with this requirement is assured by visible emission surveys and/or COM data.

Req 21 Glass Furnace Fuel Limitation **ADP 23-3596 Condition 22**

Req 21 incorporates a fuel limitation from ADP 23-3596. The Glass Furnace may only fire natural gas meeting the definition provided in 40 CFR 60.41b. This limitation is consistent with the operating scheme proposed in previous permit applications for the Glass Furnace and formed part of the basis for associated BACT determinations. Compliance with this requirement is assured by facility fuel records.

Req 22 Glass Furnace Glass Draw Limitation **ADP 23-3596 Condition 23**

Req 22 incorporates a limitation on glass draw rate from ADP 23-3596. Glass Furnace glass draw rates can be varied in response to market demand and furnace status. Increases in glass draw rate generally increase contemporaneous air emissions, and significant changes in glass draw rate have the potential to affect control equipment efficiency. Consequently, glass draw rate may not be increased more than 1.11 times the lowest glass draw rate during the most recent emission test. The facility must retest to operate at higher levels. Compliance with this requirement is assured by facility production records.

Req 23 Glass Furnace ESP/Spray Dryer **ADP 23-3596 Condition 24**

Req 23 incorporates a control equipment requirement from ADP 23-3596. The Glass Furnace must be equipped with an ESP/Spray Dryer combination for control of SO_2 and PM emissions. The ESP/Spray Dryer combination must be operated during normal Glass Furnace operation. This requirement is consistent with the operating scheme proposed in previous permit applications for the Glass Furnace and is part of associated BACT determinations. Compliance with this requirement is assured by facility operating records.

Req 24 Glass Furnace SCR System **ADP 23-3596 Condition 25**

Req 24 incorporates a control equipment requirement from ADP 23-3596. The Glass Furnace must be equipped with an SCR system for control of NO_X emissions. The SCR system must achieve a minimum NO_X emission control efficiency of 80% and be operated during normal Glass Furnace operation. This requirement is consistent with the operating scheme proposed in previous permit applications for the Glass Furnace. Compliance with this requirement is assured by facility operating records.

Req 25 Glass Furnace Control Equipment Maintenance **40 CFR 60.292(e) ADP 23-3596 Condition 26**

Req 25 incorporates maintenance provisions for Glass Furnace emission control equipment from ADP 23-3596. Each Glass Furnace emission control system may be by-passed or shutdown for up to 120 hours per year for the purposes of routine maintenance. Maintenance of each system may be done independently. The

maintenance provisions are similar but slightly more restrictive than similar provisions in 40 CFR 60.292(e), which allow maintenance periods of up to 6 days. In addition, seasonal and daily limitations are imposed on SCR system maintenance to ensure compliance with applicable NAAQS. Compliance with this requirement is assured by facility operating records.

Req 26 Annealing Lehr SO_2 Limitation ADP 23-3596 Condition 27

Req 26 incorporates a process limitation from ADP 23-3596. This limitation is a BACT measure that restricts the rate of SO_2 injection in the Annealing Lehr (lb/ton glass). Compliance with this requirement is assured by facility operating records.

Req 27 Annealing Lehr Circulation Air ADP 23-3596 Condition 28

Req 27 incorporates an operational requirement from ADP 23-3596. The facility is required to draw circulation air through the hood between the tin bath and Annealing Lehr at all times during glass production. Collected air must be exhausted through the Glass Furnace emission control system. This requirement is a BACT measure for SO_2. Compliance with this requirement is assured by facility operating records.

Req 28 Glass Cutting Emission Limit ADP 23-3596 Condition 6

Req 28 incorporates an emission limit from ADP 23-3596. This emission limit applies to VOC emissions from glass cutting operations and apply on a rolling 12-month basis. This limit reflects BACT for VOC. Compliance with this requirement is assured by facility operating records.

Req 29 Glass Cutting Material Limitation ADP 23-3596 Condition 29

Req 29 incorporates a material limitation from ADP 23-3596. Lubricant used in glass cutting operations must meet the specifications of ASTM D-235 for Type 3C mineral spirits. This material limitation is a BACT measure intended to minimize VOC emissions. Alternative lubricants may be used if approved by SWCAA. Compliance with this requirement is assured by facility operating records.

Req 30 Glass Cutting Benzene Limit ADP 23-3596 Condition 30

Req 30 incorporates a chemical constituent limit from ADP 23-3596. The benzene content of lubricant used in glass cutting operations must be less than 1% by weight. This material limitation is a BACT measure intended to minimize HAP emissions. Compliance with this requirement is assured by material content data and facility operating records.

Req 31 Work Practices for VOC Containing Materials ADP 23-3596 Condition 31

Req 31 incorporates work practices required by ADP 23-3596. VOC containing materials must be stored and disposed of in closed containers. The work practices are a BACT measure intended to minimize VOC emissions. Compliance with this requirement is assured via compliance certification by the responsible official.

Req 32 Cullet Return Baghouse #1 Emission Limits ADP 23-3596 Condition 7

Req 32 incorporates emission limits from ADP 23-3596. PM emissions from Cullet Return Baghouse #1 are limited by concentration (gr/dscf) and mass rate (lb/hr, tpy). The emission limits were representative of BACT at the time of unit approval. Compliance with this requirement is assured by emission testing and facility operating records.

Req 33 Cullet Return Baghouse #2 Emission Limits ADP 23-3596 Condition 8

Req 33 incorporates emission limits from ADP 23-3596. PM emissions from Cullet Return Baghouse #2 are limited by concentration (gr/dscf) and mass rate (lb/hr, tpy). The emission limits were representative of BACT at the time of unit approval. Compliance with this requirement is assured by emission testing and facility operating records.

Req 34 EP Dust Baghouse Emission Limits ADP 23-3596 Condition 9

Req 34 incorporates emission limits from ADP 23-3596. PM emissions from the EP Dust Baghouses are limited by concentration (gr/dscf) and mass rate (lb/hr, tpy). The emission limits were representative of BACT at the time of unit approval. Compliance with this requirement is assured by visual surveys and facility operating records.

Req 35 Dust Collector Visible Emission Limits ADP 23-3596 Condition 10

Req 35 incorporates visible emissions limits from ADP 23-3596 (% opacity). Visible emissions are limited to 0% opacity. This level of emission is consistent with proper operation of the affected dust collectors. Compliance with this requirement is assured by visible emission surveys.

Req 36 Dust Collector Differential Pressure Gauge ADP 23-3596 Condition 33

Req 36 incorporates an operational requirement from ADP 23-3596. The facility is required to install and maintain a gauge to measure differential pressure across the filtration media in each affected dust collector. The purpose of the gauge is to provide a continuous operational parameter indicative of proper operation. Compliance with this requirement is assured by facility operating records.

Req 37 Emergency Generator #1 Emission Limits ADP 23-3596 Condition 11

Req 37 incorporates emission limits from ADP 23-3596. Emissions from the associated diesel engine are limited by mass rate (lb/hr, tpy). Emission limits are based on manufacturer and/or EPA certification data. The emission limits were representative of BACT at the time of unit approval and correspond to limited operation consistent with the operating scheme proposed in the original permit application. Compliance with this requirement is assured by facility operating records.

Req 38 Emergency Generator #1 Maintenance/Testing Limitation ADP 23-3596 Condition 34

Req 38 incorporates an operational limit from ADP 23-3596. Operation for the purpose of maintenance and testing is allowed for up to 50 hr/yr. The limit does not apply to emergency service. The operational restriction was originally established as a voluntary limit by Cardinal in ADP 20-3409. The limit is more stringent than the 100 hr/yr maintenance and testing allowance found in 40 CFR 63.6640(f). Compliance with this requirement is assured by facility operating records.

Req 39 Emergency Generator #2 Emission Limits ADP 23-3596 Condition 12

Req 39 incorporates emission limits from ADP 23-3596. Emissions from the associated diesel engine are limited by mass rate (lb/hr, tpy). Emission limits are based on manufacturer and/or EPA certification data. The emission limits were representative of BACT at the time of unit approval and correspond to limited operation consistent with the operating scheme proposed in the original permit application. Compliance with this requirement is assured by facility operating records.

Req 40 Emergency Generator #2 Maintenance/Testing Limitation ADP 23-3596 Condition 35

Req 40 incorporates an operational limit from ADP 23-3596. Operation for the purpose of maintenance and testing is allowed for up to 35 hr/yr. The limit does not apply to emergency service. The operational restriction was originally established as a voluntary limit by Cardinal in ADP 21-3497. The limit is more stringent than the 100 hr/yr maintenance and testing allowance found in 40 CFR 63.6640(f). Compliance with this requirement is assured by facility operating records.

Req 41 Emergency Generator Visible Emission Limit ADP 23-3596 Condition 13

Req 41 incorporates a visible emission limit from ADP 23-3596. Visible emissions from the emergency generator diesel engines are limited to 10% opacity. The emission limit is consistent with proper engine operation and does not apply during startup periods. Compliance with this requirement is assured via periodic visible emission monitoring.

Req 42 Emergency Generator Fuel Limitation ADP 23-3596 Condition 36

Req 42 incorporates an operational limit from ADP 23-3596. Maximum fuel sulfur content of engine fuel is limited to 0.0015% by weight. This was a BACT measure for SO_2. Compliance with this requirement is assured through fuel sulfur content records.

Req 43 Emergency Generator Hour Meter 40 CFR 63.6625(f) ADP 23-3596 Condition 37

Req 43 incorporates an equipment requirement from 40 CFR 63 Subpart ZZZZ and ADP 23-3596. The Permittee must equip each emergency engine with a non-resettable hour meter, consistent with the provisions of 40 CFR 63.6625(f). The purpose of the hour meter is to provide a reliable record of unit operation that can be used to demonstrate compliance with applicable operational limits. Compliance with this requirement is assured via compliance certification by the responsible official.

Req 44 Emergency Generator Testing Limit ADP 23-3596 Condition XX

Req 44 incorporates an operational limit from ADP 23-3596. Only one emergency generator may be operated for testing and maintenance at any given time. This measure minimizes short term ambient NO_X impact and is part of facility compliance with applicable NAAQS. Compliance with this requirement is assured by facility operating records.

Req 45 Emergency Generator Glass Furnace Maintenance ADP 23-3596 Condition XX

Req 45 incorporates an operational limit from ADP 23-3596. Only one emergency generator may be operated for testing and maintenance at any given time. This measure helps to minimize ambient NO_X impact. Compliance with this requirement is assured by facility operating records.

Req 46 Emergency Generator Subpart ZZZZ Operational Limit 40 CFR 63.6640 (f)

Req 46 incorporates operational limits from 40 CFR 63 Subpart ZZZZ. The emergency generator engines must comply with these limitations in order to be considered emergency engines under 40 CFR 63, Subpart ZZZZ. Operation is limited to emergency situations, maintenance and readiness testing, and up to 50 hr/yr in nonemergency situations. Compliance with this requirement is assured via hour meter readings and facility operating records.

Req 47 Emergency Generator Minimize Idle/Startup 40 CFR 63.6625(h)

Req 47 incorporates an operational limit from 40 CFR 63 Subpart ZZZZ. Each emergency engine must minimize the time spent idling and starting up. Compliance with these requirements is assured by hour meter readings and facility operating records.

Req 48 Emergency Generator Operation and Maintenance **40 CFR 63.6605(b)**
40 CFR 63.6625(e)
40 CFR 63.6640(a)

Req 48 incorporates operational and maintenance requirements from 40 CFR 63 Subpart ZZZZ. Each emergency engine must be operated and maintained in a manner consistent with good air pollution control practices for minimizing emissions. Maintenance of emergency engines must be in accordance with manufacturer's written instructions or an equivalent facility specific maintenance plan. As provided for in 40 CFR 63.6625(e), the Permittee has opted to implement a facility specific maintenance plan that provides for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions. The maintenance plan requires annual inspection and/or replacement of critical engine components. Compliance with these requirements is assured by hour meter readings and facility maintenance records.

Req 49 Emergency Generator Subpart ZZZZ Maintenance **40 CFR 63.6603(a)**
40 CFR 63.6640(a)

Req 49 incorporates maintenance requirements from 40 CFR 63 Subpart ZZZZ. Each emergency engine must inspect and/or replace critical engine components on a regular schedule, not to exceed an annual frequency. Compliance with these requirements is assured by facility operating and maintenance records.

Req 50 Misc. Burners/Space Heaters Emission Limits **ADP 23-3596 Condition 14**

Req 50 incorporates emission limits from ADP 23-3596 (lb/hr, tpy). This emission unit is composed of multiple small burners and heaters located in various locations at the facility. The emission limits are based on fuel consumption and generic emission factors from EPA AP-42. Compliance with this requirement is assured by fuel consumption records.

Req 51 Misc. Burners/Space Heaters Visible Emission Limits **ADP 23-3596 Condition 15**

Req 51 incorporates visible emissions limits from ADP 23-3596. Visible emission limits are limited to 0% opacity. This level of emission is consistent with proper operation of the affected burners and heaters. Compliance with this requirement is assured by visible emission surveys.

Req 52 Hydrogen Generation System Emission Limits **ADP 23-3596 Condition 16**

Req 52 incorporates emission limits from ADP 23-3596 (lb/hr, tpy). This emission unit is a package hydrogen generation system operated by a third party under contract. The emission limits are based on operational information provided by the equipment vendor. Compliance with this requirement is assured by facility operating records.

Req 53 Hydrogen Generation System Visible Emission Limits **ADP 23-3596 Condition 17**

Req 53 incorporates visible emissions limits from ADP 23-3596. Visible emission limits are limited to 0% opacity. This level of emission is consistent with proper operation of the affected equipment. Compliance with this requirement is assured by visible emission surveys.

Req 54 Exhaust Discharge Requirements **ADP 23-3596 Condition 40**

Req 54 incorporates exhaust discharge requirements from ADP 23-3596 Condition 40. Exhaust gases from each affected emission unit must discharge vertically and at a minimum height. Installation of rain caps that inhibit vertical discharge is prohibited. The intent is to maximize dispersion and dissipation of exhaust streams from affected emission units. These requirements reflect the equipment configuration proposed in applicable permit applications and were relied upon in modelling the ambient impact of emissions from

affected units. Compliance with this requirement is assured via facility construction records and compliance certification by the responsible official.

VI. EXPLANATION OF MONITORING AND RECORDKEEPING TERMS AND CONDITIONS

M1. General Recordkeeping

This monitoring section cites recordkeeping requirements drawn from WAC 173-401-615 and ADP 23-3596. Recordkeeping requirements have been separated into sub-categories for easier reference. Records must be maintained for at least 5 years from the date of recording pursuant to the general recordkeeping provisions of WAC 173-401-615(2)(c).

M2. Visible Emissions Monitoring

This monitoring section is applicable to general requirements drawn from SWCAA 400-040 and ADP 23-3596. The applicable requirements limit visible emissions but do not establish a specific regime of monitoring or recordkeeping so SWCAA has implemented monitoring requirements under the "gap filling" provisions of WAC 173-401-615.

The monitoring scheme specified by this requirement is designed to provide periodic assurance of compliance and identify potential visible emission violations in a timely fashion, prompting corrective action when necessary. A monthly inspection frequency is considered adequate to assure compliance with applicable opacity requirements because this monitoring is applicable only to minor units at the facility, which have a good history of compliance. This monitoring is not applicable to the Glass Furnace, which is subject to separate monitoring requirements in M9.

M3. Fugitive Emissions and Fallout Monitoring

This monitoring section is applicable to general requirements drawn from SWCAA 400-040, SWCAA 400-070, and ADP 23-3596. These requirements do not establish a specific regime of monitoring or recordkeeping so SWCAA has implemented monitoring requirements under the "gap filling" provisions of WAC 173-401-615.

This monitoring requirement is designed to assure compliance through periodic visual inspections of the facility and prompt corrective action. A lack of visual emissions or material accumulation is considered indicative of compliance with the applicable particulate matter emission limits and work practices.

M4. Complaint Log

This monitoring section is applicable to requirements drawn from SWCAA 400 and ADP 23-3596. These requirements do not directly establish any specific regime of monitoring or recordkeeping so SWCAA has implemented monitoring requirements under the "gap filling" provisions of WAC 173-401-615.

The affected applicable requirements prohibit unacceptable impacts on neighboring properties and/or surrounding populations. While many of the prohibited impacts might be observed from the facility itself, compliance with all provisions cannot be assured by onsite observations alone (e.g., offsite odor impact). Therefore, this monitoring scheme relies on input from affected parties. The monitoring is designed to ensure compliance through prompt complaint response and corrective action. The facility is required to maintain records documenting the nature of each complaint, the complainant (if known), and corresponding corrective action (if any).

M5. Compliance Certification

This monitoring section is applicable to requirements drawn from SWCAA 400-040 and ADP 23-3596. These requirements do not directly establish any specific regime of monitoring or recordkeeping so SWCAA has implemented monitoring requirements under the "gap filling" provisions of WAC 173-401-615. There are few, if any, operational records relevant to demonstrating compliance. SWCAA relies upon facility records and compliance certification by the responsible official to provide compliance assurance.

The affected requirements are divided into two broad categories; equipment configuration/operation restrictions and general work practice requirements. Equipment restrictions are aimed at fundamental operating modes (no masking, fuel type, use of control technology, sampling port access, etc.) that do not change significantly once established. Hence, periodic certification that no changes have been made to equipment function or design is an appropriate means of assuring compliance for these requirements. The general work practice requirements (closed VOC containers, operate to minimize emissions, etc.) are primarily a function of worker training and workplace management. Compliance with these requirements is best ensured through active oversight by facility managers. The due diligence associated with periodic compliance certification serves to confirm compliance.

M6. Glass Furnace Operations Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Condition 45. The Permittee is required to record primary operational parameters (operating hours, glass draw, fuel consumption, exhaust flowrate, aqueous ammonia concentration), deviations from permit conditions (excess emissions, CAM excursions, upset conditions), furnace disruptions (startup/shutdown, hot fan transitions, hot hold periods, maintenance activities), and control equipment maintenance periods. Monitoring provisions are intended to aid in compliance assurance by documenting the operational status of the Glass Furnace on a continual basis.

Emissions of NO_X, SO_2, and PM are inherently higher when related control equipment is offline for maintenance and/or repair. Alternative emission limits are in effect during maintenance periods with the duration and timing of maintenance periods restricted in order to satisfy BACT and limit the ambient impact of associated emissions. Monitoring the time and duration of maintenance periods is intended to assure compliance with those restrictions.

M7. Glass Furnace NO_X / CO / SO_2 CEMS

The provisions of this monitoring section are drawn from ADP 23-3596 Conditions 45 and 53. The Permittee is required to install and maintain continuous emission monitoring systems (CEMS) to monitor NO_X, CO, and SO_2 emissions from the Glass Furnace. Pollutant emissions must be calculated and recorded for specified averaging periods using CEMS data, monitored flowrate, and recorded glass draw. All CEMS are to be operated in accordance with 40 CFR 60, Appendix B – Performance Specification 6 and 40 CFR 60, Appendix F.

M8. Glass Furnace Emission Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Conditions 45 and 52. Monitoring provisions establish emission testing and emission calculation requirements for VOC, PM, total fluoride, and sulfuric acid. Initial emission testing is required to quantify emissions of total fluoride and sulfuric acid from the Glass Furnace (*conducted March 13-14, 2007*). Periodic emission testing is required to quantify ongoing emissions of PM/PM_{10} and VOC from the Glass Furnace. Emission testing may be conducted at any glass draw rate selected by the Permittee, but low draw rates have the potential to limit subsequent production pursuant to Req 22 of this permit. These provisions are intended to assure compliance with applicable emission limits.

Annual emissions of PM/PM_{10}, VOC, total fluoride, and sulfuric acid must be calculated from recorded glass draw and the most recent emission test data. Emissions of PM/PM_{10} during ESP maintenance periods must be calculated from recorded glass draw and uncontrolled emission factors approved by SWCAA. The uncontrolled emission factors currently in use are based on emission test data from a similar facility (*Cardinal – North Carolina*).

Pollutant	Emission Factor
$PM_{10}/PM_{2.5}$ (filterable)	0.4213 lb/ton_g
$PM_{10}/PM_{2.5}$ (condensable)	0.2336 lb/ton_g

M9. Glass Furnace Opacity Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Conditions 45 and 54. The Permittee is required to monitor and record visible emissions from the Glass Furnace exhaust stack on a monthly basis using SWCAA Method 9. The length of each visible emission survey may vary from a minimum of 20 minutes to a maximum of 60 minutes depending on whether noncompliant visible emissions are observed. A continuous monitoring method may be used in lieu of performing Method 9 observations. This provision is intended to assure compliance with applicable visible emission limits.

M10. Glass Furnace Filterable PM Compliance Assurance Monitoring

The Glass Furnace is subject to an emission limitation for filterable PM, achieves compliance with the limit through the use of a control device (ESP), has potential pre-control device emissions of greater than 100 tpy, and is not equipped with a CEMS/CERMS to monitor filterable PM emissions. Therefore, filterable PM emissions from the Glass Furnace are subject to the provisions of CAM (40 CFR 64). The provisions of this monitoring section are intended to serve as the required CAM plan.

The Permittee has identified total ESP field power as an indicator of compliance consistent with 40 CFR 64.3. As specified in 40 CFR 64(b)(ii), the Permittee is required to collect four or more data values equally spaced over each hour and average the values. The Permittee has established a minimum value for total ESP field power (20 kW) that provides a reasonable assurance of ongoing compliance with the applicable filterable PM emission limits. The identified minimum value was derived from the results of multiple filterable PM emission tests (EPA Method 5) using a variety of field power levels and operating conditions. The test results indicate compliance with the applicable filterable PM emission limits by a significant margin at the identified value. The test results also demonstrated that as long as minimum total field power was maintained, compliance was achieved with only three of four ESP fields in operation. Consequently, operation of the ESP with one field out of service is not necessarily considered to be an excursion.

Any period during which total ESP field power falls below 20 kW and cannot be brought back into conformance within 6-hours from the time the out-of-range condition was first noted or recorded is considered to be an excursion.

M11. Annealing Lehr Emission Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Conditions 45 and 52. The Permittee is required to monitor SO_2 consumption in the Annealing Lehr by recording the beginning and ending weight of each SO_2 gas cylinder used in the process. The rate of SO_2 use is determined by dividing monitored SO_2 consumption by the contemporaneous glass draw. The Permittee is also required to record the time and duration of any instance during which the hood between the tin bath and Annealing Lehr does not exhaust to

the Glass Furnace combustion air header. These provisions are intended to assure compliance with use limits and operational restrictions applicable to the Annealing Lehr.

M12. Glass Cutting Emission Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Condition 47. The Permittee is required to maintain vender certification and material content data for each type of glass cutting lubricant in use and record monthly lubricant consumption. For emission inventory purposes, VOC, HAP, and TAP emissions are calculated from recorded material consumption using mass balance methodology. These provisions are intended to assure compliance with consumption limits and material specifications applicable to glass cutting operations.

M13. Cullet Return Baghouse #1 Emission Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Conditions 48 and 55. The Permittee is required to record hours of operation, measure filter media pressure drop, and maintenance activity. PM/PM_{10} emission concentration must be quantified by periodic emission testing using EPA reference methods. These provisions are intended to assure compliance with PM emission limits applicable to Cullet Return Baghouse #1.

The hourly PM/PM_{10} emission rate must be calculated from exhaust flowrate and the most recently tested emission concentration. Annual PM/PM_{10} emissions must be calculated from recorded hours of operation, exhaust flowrate, and the most recently tested emission concentration.

M14. Cullet Return Baghouse #2 Emission Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Conditions 33, 48, and 56. The Permittee is required to record hours of operation, measure filter media pressure drop, and maintenance activity. PM/PM_{10} emission concentration must be quantified by periodic emission testing using EPA reference methods. These provisions are intended to assure compliance with PM emission limits applicable to Cullet Return Baghouse #2.

The hourly PM/PM_{10} emission rate must be calculated from exhaust flowrate and the most recently tested emission concentration. Annual PM/PM_{10} emissions must be calculated from recorded hours of operation, exhaust flowrate, and the most recently tested emission concentration.

M15. EP Dust Baghouse Emission Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Conditions 33, 48, and 57. The Permittee is required to record hours of operation, measure filter media pressure drop, and maintenance activity. A lack of visible emissions serves as an indicator of compliance. Emission testing using an EPA reference method (Method 5/17) is not required unless a Notice of Violation is issued for excessive visible emissions. In combination with facility-wide visual surveys pursuant to monitoring requirement M1, these provisions are intended to assure compliance with PM emission limits applicable to the EP Dust baghouses.

Annual PM/PM_{10} emissions must be calculated from recorded hours of operation, exhaust flowrate, and the maximum allowable emission concentration (0.005 gr/dscf).

M16. Emergency Generator Emission Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Condition 49 and 40 CFR 63, Subpart ZZZZ. The Permittee is required to record hours of operation and the nature of each operating period. These records are the basis for assuring compliance with the various use restrictions applicable to the unit's diesel

engine. Periodic emission testing is not required for this unit due to its status as an existing, emergency use compression ignition engine. Vendor fuel certifications have been deemed sufficient to demonstrate compliance with applicable fuel sulfur content limitations. These provisions are intended to assure compliance with emission limits, fuel standards, maintenance requirements, and operational restrictions applicable to the Emergency Generators.

Annual emissions must be calculated from recorded hours of operation using the following emission factors:

Pollutant	Emergency Generator #1	Emergency Generator #2
NO_X	40.56 lb/hr	35.38 lb/hr
CO	4.15 lb/hr	1.94 lb/hr
VOC	1.08 lb/hr	0.70 lb/hr
$PM/PM_{10}/PM_{2.5}$	0.91 lb/hr	0.17 lb/hr
SO_2	0.03 lb/hr	0.03 lb/hr

M17. Misc. Burners/Space Heaters Emission Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Condition 50. The Permittee is required to maintain a record of fuel consumption and maintenance activity. These provisions are intended to assure compliance with emission limits applicable to Misc. Burners and Space Heaters at the facility.

Annual emissions must be calculated from recorded fuel consumption using the following emission factors:

Pollutant	Emission Factor
NO_X	0.0980 lb/MMBtu
CO	0.0820 lb/MMBtu
VOC	0.0054 lb/MMBtu
$PM/PM_{10}/PM_{2.5}$	0.0075 lb/MMBtu
SO_2	0.0006 lb/MMBtu

M18. Hydrogen Generation Station Emission Monitoring

The provisions of this monitoring section are drawn from ADP 23-3596 Condition 51. The Permittee is required to maintain a record of system operation. This provision is intended to assure compliance with emission limits applicable to the Hydrogen Generation Station.

Annual emissions must be calculated from recorded hours of operation using data provided by the contracted operator or the following default emission factors:

Pollutant	Emission Factor
NO_X	0.0850 lb/hr
CO	0.0714 lb/hr
VOC	0.0047 lb/hr
$PM/PM_{10}/PM_{2.5}$	0.0065 lb/hr
SO_2	0.0005 lb/hr

M19. Greenhouse Gas Emission Monitoring

The provisions of this monitoring section are drawn from WAC 173-441-050. The Permittee is required to maintain a record of applicable data elements specified in WAC 173-441-050(6)(a)-(h). Greenhouse gas emissions are to be calculated using the methodologies specified in relevant sections of WAC 173-441. These provisions are intended to assure compliance with applicable greenhouse gas emission requirements.

Greenhouse gas emissions must be calculated using the methodologies specified in relevant sections of WAC 173-441.

VII. EXPLANATION OF REPORTING TERMS AND CONDITIONS

R1. Deviations from Permit Conditions

The provisions of this reporting section are drawn from WAC 173-401-615(3), SWCAA 400-107, and ADP 23-3596 Condition 60. The Permittee is required to promptly report all permit deviations. SWCAA may request a full written report of any deviation if determined to be necessary. All permit deviations are also to be identified in the subsequent quarterly report. Reporting timelines vary depending on the type of deviation involved.

- The general timeline for deviation reporting (within 30 days following the end of the month of discovery) is cited in WAC 173-401-615(3) and ADP 23-3596 Condition 60.
- The timeline for reporting if the Permittee wishes to claim excess emissions as unavoidable (within 48 hours of discovery) is defined in SWCAA 400-107.
- The timeline for deviations that pose a potential threat to human health and safety (within 12 hours of discovery) is taken directly from WAC 173-401-615(3).

CAM excursions, as described in condition M10, are considered to be deviations for the purpose of reporting under this section.

R2. Complaint Reports

The provisions of this reporting section are drawn from ADP 23-3596 Condition 58. The Permittee is required to report all complaints to SWCAA within 3 business days of receipt. The intent of these provisions is to ensure a timely and effective response to complaints by either facility personnel or SWCAA.

R3. Glass Furnace Control Equipment By-pass

The provisions of this reporting section are drawn from ADP 23-3596 Condition 62. The Permittee is required to notify SCWAA at least 10 calendar days prior to by-passing Glass Furnace control equipment for purposes of routine maintenance. The intent is to allow SWCAA to track the frequency and duration of maintenance events and confirm compliance with applicable operational restrictions.

R4. New TAP Emissions

The provisions of this reporting section are drawn from ADP 23-3596 Condition 61. The Permittee is required to notify SWCAA at least 7 calendar days in advance of using any new material which results in the emission of toxic or hazardous air pollutants not previously emitted. SWCAA may require a written report detailing the anticipated change(s). The intent of these provisions is to assure compliance with applicable New Source Review and TAP requirements.

R5. Emission Test Reports

The provisions of this reporting section are drawn from ADP 23-3596 Condition 63. The Permittee is required to report emission test results and associated operational data to SWCAA within 45 days of test completion. The intent of this provision is to assure timely reporting of test results.

R6. Quarterly Reports

The provisions of this reporting section are drawn from ADP 23-3596 Condition 65. The Permittee is required to submit specified monitoring records and certification of monitoring records on a quarterly basis. The intent of this requirement is to provide SWCAA with timely information regarding facility operations and compliance status. The individual data elements to be reported are specified in the reporting requirement.

R7. Semi-Annual Reports

The provisions of this reporting section are drawn from WAC 173-401-615(3). The Permittee is required to report the status of all monitoring requirements. All instances of deviation from permit requirements during the reporting period must be clearly identified. If no deviations occurred, then a statement to that effect must be submitted. The report must contain a certification of all reports previously submitted during the semi-annual period that have not already been certified. The certification must be made consistent with WAC 173-401-520. No semi-annual report is necessary if all required information has been included in corresponding quarterly reports.

R8. Annual Compliance Certification

The provisions of this reporting section are drawn from WAC 173-401-630(5). The Permittee is required to report and certify compliance with all permit terms and conditions on an annual basis pursuant to SWCAA 401-630(5). The Permittee is required by 40 CFR 60.11(g) to consider credible evidence when submitting compliance certifications for NSPS affected units (Glass Furnace). The intent of this requirement is for the responsible official to formally review and confirm the compliance status of the facility with respect to each applicable requirement.

R9. Emission Inventory Reports

This reporting requirement is drawn from SWCAA 400-105 and ADP 23-3596 Condition 59. The Permittee is required to submit an emissions inventory report to SWCAA by March 15th for the previous calendar year. A complete emissions inventory includes quantification of emissions from all emission units at the facility. SWCAA's Executive Director may extend the submittal date by up to 60 days, pursuant to SWCAA 400-105(1). The intent of this requirement is to collect facility emissions data for the purposes of confirming compliance with applicable emission limits and reporting emission inventories to the Department of Ecology and EPA.

R10. Greenhouse Gas Emission Reports

This reporting requirement incorporates the annual greenhouse gas (GHG) emission reporting requirements contained in WAC 173-441-050(3). The report and certificate or representation must be submitted in accordance with the requirements of WAC 173-441-050 and 173-441-060 and in a format specified by Ecology. Each annual report and any other submission under Chapter 173-441 WAC must be certified, signed, and submitted by the designated representative or any alternate designated representative.

VIII. EXPLANATION OF FUTURE REQUIREMENTS

No future requirements have been identified.

IX. EXPLANATION OF OBSOLETE REQUIREMENTS

1. Glass Furnace – Notification for NSPS Subpart CC

The Glass Furnace is subject to an NSPS regulation (40 CFR 60, Subpart CC), and must provide notification as provided in 40 CFR 60.7. These requirements have been met as described below.

Notification of construction:	Submitted via letter dated December 12, 2005
Notification of anticipated startup:	Submitted via letter dated August 1, 2006
Notification of actual startup:	Submitted via letter dated August 31, 2006

2. Glass Furnace – Initial Performance Test for NSPS Subpart CC 4

The Glass Furnace is subject to the PM standard described in 40 CFR 60.292(a). Therefore, the unit is also subject to the initial performance testing requirements of 40 CFR 60.8. These requirements have been met as described below.

Initial performance test:	Performed March 12, 2007
Source test report:	Submitted May 1, 2007

3. Obsolete PSD Permits

The Department of Ecology has issued a total of three PSD permits for the Winlock facility since it was initially proposed. As identified in Section XI below, the facility no longer has a PSD permit.

PSD-03-03-A2 issued December 13, 2010	Rescinded by Ecology (*December 3, 2024 ltr*)
PSD-03-03-A1 issued February 14, 2008	Superseded by PSD-03-03-A2
PSD-03-03 issued January 13, 2005	Superseded by PSD-03-03-A1

4. Obsolete Air Discharge Permits

SWCAA has issued a total of seven ADPs for the Winlock facility since it was initially proposed. As identified in Section XI below, only the latest permit is still active (ADP 23-3596). Approval conditions in previous permits have been superseded.

ADP 22-3529 issued July 27, 2022	Superseded by ADP 23-3596
ADP 21-3497 issued February 15, 2022	Superseded by ADP 22-3529
ADP 20-3409 issued February 11, 2021	Superseded by ADP 21-3497
ADP 04-2568R2 issued December 16, 2008	Superseded by ADP 20-3409
ADP 04-2568R1 issued September 26, 2007	Superseded by ADP 04-2568R2
ADP 04-2568 issued October 4, 2004	Superseded by ADP 04-2568R1

X. RESPONSE TO COMMENTS

1. Response to Public Comments

To be completed after public comment period closes.

2. Response to EPA Comments

To be completed after EPA review period closes.

XI. Facility History

Permit/Regulatory Order Actions

The following table lists each Permit and Order issued for this facility. Permits or Orders in italics contain no active requirements. The requirements may have been superseded, may have been of limited duration, or the equipment may have been removed.

Permit/Order	App. #	Date Issued	Description of Action
ADP 23-3596	L-735	8/14/2023	Modification of SCR maintenance schedule and hot fan transition language in ADP 22-3529.
Obsolete Order/Permit			
ADP 22-3529	*L-729*	*7/27/2022*	*Installation of a hydrogen generation system and modification of the maintenance period for control equipment maintenance.*
ADP 21-3497	*L-723*	*2/15/2022*	*Installation of a larger emergency generator than previously proposed to accommodate changes in emission control equipment at the facility.*
ADP 20-3409	*L-706*	*2/11/2021*	*Modification of Glass Furnace to install a new Selective Catalytic Reduction control system for NOx emissions and increase glass production from 650 to 750 tpy. Installation of Emergency Generator 2 (Caterpillar 1829 bhp, EPA Tier 2). Removal of SCR from Emergency Generator 1. Establishment of voluntary plant site emission limits below PSD major source thresholds (PSD Opt-out).*
PSD-03-03-A2	*--*	*12/3/2010*	*Modification of existing permit terms to incorporate an annual maintenance shutdown of the spray drier scrubber and electrostatic precipitator.*
ADP 04-2568R2	*L-627*	*12/16/2008*	*Installation of two manual glass packing lines with dedicated baghouse (Cullet Return Baghouse #2). Modification of Glass Furnace visible emissions limit to approve higher values during lead fan switching events.*
PSD-03-03-A1	*--*	*2/14/2008*	*Administrative modification of original permit terms related to conducting all compliance tests at not less than 90% of the daily glass draw capacity of the facility. Cardinal FG proposed to establish a permit clause that would retain the 90% relationship, but allow testing at a lower operating rate in exchange for a lower operating limit. The amended permit terms allow Cardinal to return to full capacity subsequent to a successful compliance test at a higher glass draw rates provided the 90% relationship is maintained.*

Permit/Order	App. #	Date Issued	Description of Action
ADP 04-2568R1	*L-597*	*9/26/2007*	*Approval of two "EP dust" baghouses associated with the material catch reclaim system on the Glass Furnace electrostatic precipitator. The baghouses were installed during initial facility construction but were not cited in either of the original new source review permits (PSD-03-03, ADP 04-2568).* *Revision of equipment citations and emission estimates to reflect installation of one emergency generator rather than two as approved in original permit applications.*
PSD-03-03	*--*	*1/13/2005*	*Installation of a new flat glass manufacturing facility in Winlock, Washington.*
ADP 04-2568	*L-524*	*10/4/2004*	*Installation of a new flat glass manufacturing facility in Winlock, Washington.*

Title V Permit Actions

1. SW08-14-R2 (Renewal Permit)

Application received:	January 16, 2023 (*initial*)
	February 7, 2023 (*final*)
Application complete:	February 8, 2023
Application sent to EPA:	February 8, 2023
Draft permit issued:	April 11, 2025
Proposed permit issued:	TBD
Final permit issued:	TBD

2. SW08-14-R1 (Renewal Permit)

Application received:	September 14, 2016
Application complete:	December 9, 2016
Application sent to EPA:	December 9, 2016
Draft permit issued:	September 27, 2018
Proposed permit issued:	November 1, 2018
Final permit issued:	January 22, 2019

3. SW08-14-R0 (Initial Permit)

Application received:	September 9, 2008
Application complete:	September 19, 2008
Application sent to EPA:	September 24, 2008
Draft permit issued:	June 20, 2012
Proposed permit issued:	August 2, 2012
Final permit issued:	September 27, 2012

Compliance History

The following Notices of Violation (NOV) or Notices of Correction (NOC) were issued during the last permit term (January 22, 2019 to present):

NOC/NOV	Date Issued	Description
10956	3/22/2024	Emissions of sulfur dioxide and opacity in excess of applicable emission standards.
10954	12/28/2023	Emissions of nitrogen oxides in excess of applicable emission standards.
10952	9/22/2023	Emissions of nitrogen oxides and sulfur dioxide in excess of applicable emission standards.
10397	3/3/2023	Emissions of nitrogen oxides, sulfur dioxide, and opacity in excess of applicable emission standards during a plantwide power outage.
10393	12/9/2022	Emissions of sulfur dioxide and opacity in excess of applicable emission standards during a power outage.
10391	5/4/2022	Emissions of sulfur dioxide and opacity in excess of applicable emission standards during a power outage.
10389	9/22/2021	Visible emissions from the glass furnace in excess of applicable emission standards.
10383	3/8/2021	Visible emissions from the glass furnace in excess of applicable emission standards.
6611	10/1/2020	Visible emissions from the glass furnace in excess of applicable emission standards.
6605	10/23/2019	Excess emissions from the glass furnace exhaust stack during maintenance by-pass.

XII. EXPLANATION OF APPENDICES

Appendix A / Glass Furnace – Emission Testing Requirements

Appendix A contains a testing protocol to be used when emission testing the Glass Furnace. The testing protocol is drawn from ADP 23-3596, Appendix A. The reference test methods presented in the appendix are the same as those specified in the original permit sections.

Appendix B / Glass Furnace – CEMS Audit Requirements

Appendix B contains performance specifications for the continuous monitoring systems installed on the Glass Furnace. The specifications are applicable to the CEMS for NO_X, CO, and SO_2. The performance specifications are drawn from ADP 23-3596, Appendix B.

Appendix C / Cullet Return Baghouse #1 – Emission Testing Requirements

Appendix C contains a testing protocol to be used when emission testing Cullet Return Baghouse #1. The testing protocol is drawn from ADP 23-3596, Appendix C. The reference test methods presented in the appendix are the same as those specified in the original permit sections.

Appendix D / Cullet Return Baghouse #2 – Emission Testing Requirements

Appendix D contains a testing protocol to be used when emission testing Cullet Return Baghouse #2. The testing protocol is drawn from ADP 23-3596, Appendix D. The reference test methods presented in the appendix are the same as those specified in the original permit sections.

Appendix E / EP Dust Baghouses – Emission Testing Requirements

Appendix E contains a testing protocol to be used when emission testing the EP Dust Baghouses. The testing protocol is drawn from ADP 23-3596, Appendix E. The reference test methods presented in the appendix are the same as those specified in the original permit sections.