



DEPARTMENT OF
ECOLOGY
State of Washington

PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMIT

Issued To:	The Boeing Company Boeing Commercial Airplanes Everett Facility
Facility Location:	3003 West Casino Road Everett, Washington 98203
Permit Number:	PSD 14-01, Amendment 1
Date of Original Permit Issuance:	September 10, 2014
Effective Date of Permit:	September 10, 2014
Effective Date of Amendment 1:	December 9, 2015

This PSD permit is issued under the authority of the Washington State Clean Air Act, Chapter 70.94 Revised Code of Washington; the Washington State Department of Ecology regulations for the Prevention of Significant Deterioration of Air Quality as set forth in Washington Administrative Code 173-400-700 through 750.

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PROJECT SUMMARY

Boeing Commercial Airplane's Everett facility (Boeing Everett) builds wide-body airplanes. Boeing Everett manufactures the model 747, 767, 777, and 787 airplanes. This manufacturing effort includes making the airplane cabin interior components for the Boeing 737, as well as for the 747, 767, 777, and 787.

Boeing proposes to produce new models of the Boeing 777, hereafter referred to as the "777X" models in this document. Production of the 777X is scheduled to begin in 2017. Delivery of the first 777X is targeted for 2020. As production of the 777X ramps up, production of the current 777 models, hereafter referred to as "legacy 777s" in this document, will decrease. By the early to mid-2020s, production of the legacy 777 models is expected to be phased out.

Certain components for the 777X wing will be made in Everett in a new building located on the Boeing Everett site. Final assembly of the 777X will occur in the same building where the legacy 777 models are currently assembled.

The proposed project includes two phases. The first phase will transition production of legacy 777 models to 777X models. The second phase will increase the maximum production capacity and thereafter the production rate from the current rate of about 8.3 legacy 777s per month (or about 100 per year) to as many as 10.4 777X models per month (about 125 777X per year).

Boeing requested Phase 1 to consist of two components:

1. The first component of Phase 1 will be to make the changes to the facility necessary to begin production of the 777X model while maintaining production of legacy 777 models at levels up to approximately 8.3 airplanes per month per existing approval under PSD Permit No. 11-01. The changes include constructing a new building to manufacture the components for the new composite wing and creating additional wing and airplane assembly capacity for the 777X within the existing buildings.
2. The second component of Phase 1 is an increase in 777X production capacity and rate to approximately 8.3 airplanes per month that corresponds with a decrease production of legacy 777 models to the point where eventually the facility will no longer produce legacy 777 models. During Phase 1, Boeing Everett does not plan to exceed a combined 777 production rate (i.e., rate for legacy 777s plus 777Xs) of approximately 8.3 airplanes per month.

Phase 1 will include the following modifications at Boeing Everett to achieve a production capacity of 8.3 777Xs per month:

1. Constructing a new building (Building 40-58) to fabricate 777X wing components.
2. Installing a new 777X wing spar build-up line in an existing building.
3. Installing a new 777X wing assembly line in an existing building.
4. Installing a new 777X final assembly line in an existing building.

5. Reconfiguring the existing legacy 777 final assembly line to accommodate final assembly of the 777X.
6. Constructing new 777X vertical fin spray booths and prep booths in an existing building.
7. Changing existing tooling and equipment throughout the 777 factory to accommodate the larger 777X body sections and/or wings.

Boeing requested Phase 2 be included in this permit. The second phase of this project will be to make further changes to the Boeing Everett facility with the intent of increasing the overall 777X production capacity. Phase 2 will make further changes to Boeing Everett to increase overall 777X production capacity to up to about 10.4 airplanes per month. Phase 2 is tentatively scheduled to begin in 2021, and will involve additional tooling and equipment to increase the 777X production capacity. For example, additional tape layup machines for fabricating wing panels might be installed in the wing component fabrication building, and include additional spray booths.

A Prevention of Significant Deterioration (PSD) analysis was performed for the project for all pollutants to determine if any increase was above the “significance” level. The project will result in a significant net emissions increase of volatile organic compounds (VOC).

A full technical review of the project for VOC, including a Best Available Control Technology (BACT) analysis, and the project’s effect on national ambient air quality standards (NAAQS), PSD increments, visibility, soils, and vegetation, is required and included in a Technical Support Document (TSD) prepared by the Washington State Department of Ecology (Ecology) on July 30, 2014.

The emissions of other air pollutants not subjected to PSD review will be covered in the Puget Sound Clean Air Agency (PSCAA) Notice of Construction (NOC) approval for this project.

APPROVAL CONDITIONS

Based on the PSD permit application for Amendment 1, submitted by Boeing on September 2, 2015, and the technical review performed by Ecology, Ecology finds that all requirements for issuance of this PSD permit have been satisfied. Ecology determined the application complete on September 24, 2015. Approval of the project is granted subject to the following conditions:

I. EFFECTIVE DATE OF PERMIT

In accordance with 40 CFR § 124.15 and § 124.19, and the Washington Administrative Code (WAC) 173-400-730(2)(c), the effective date of this PSD permit is one of the following dates:

- A. If no comments requesting a change in the preliminary determination were received: the date of issuance; or
- B. If comments requesting a change in the preliminary determination were received: thirty (30) days after the applicant and the commenters receive the final determination; or
- C. If a review of the final determination is requested pursuant to 40 CFR § 124.13 and 40 CFR § 124.19 (see WAC 173-400-730(4)), the effective date of this permit is suspended until such time as the review and any subsequent appeal against this permit are resolved.

II. PERMIT EXPIRATION

Pursuant to 40 CFR § 52.21(r)(2) and WAC 173-400-730(5), and unless an extension is granted by Ecology prior to expiration, Boeing's authorization to construct under this PSD permit expires as follows:

- A. This permit expires, and re-permitting will be required before any further construction activity may occur, if:
 - 1. Construction of Phase 1 has not commenced (as defined in 40 CFR § 52.21 (b)(9)) within eighteen (18) months of the effective date of this permit; or
 - 2. Construction of Phase 1 is discontinued for a period of eighteen (18) months or more; or
 - 3. Construction of Phase 1 is not completed within a reasonable time.
- B. Phase 2 of this permit expires, and re-permitting will be required before any further construction activity occurs on the Phase 2 changes, if:

1. Construction of Phase 2 has not commenced (as defined in 40 CFR § 52.21(b)(9)) within eighteen (18) months of December 1, 2021; or
 2. Construction of Phase 2 is discontinued for a period of eighteen (18) months or more; or
 3. Construction of Phase 2 is not completed within a reasonable time.
- C. The expiration of Boeing's authorization to continue construction of the Phase 2 changes pursuant to Section II.B. does not affect Boeing's authorization to continue construction the Phase 1 changes subject to all applicable requirements of this permit.

III. PERMIT NOTIFICATION REQUIREMENTS

- A. Boeing's requirements in this PSD permit to notify, report to, or acquire approval or agreement from "Ecology and/or the PSCAA" may be satisfied by providing such notification, reporting, or approval request to PSCAA if the conditions of this PSD permit have been incorporated into Boeing Everett's Title V Air Operating Permit issued pursuant to 40 CFR Part 70 and Chapter 173-401 WAC.
- B. Boeing must notify Ecology and PSCAA in writing or electronic mail of the date construction on the 777X project is commenced, postmarked or received no later than thirty (30) days after such date.
- C. By June 15 of each year, Boeing must submit to Ecology, in writing or electronic mail, an annual report containing a brief summary of the construction activities related to the 777X project that occurred during the previous calendar year. This reporting obligation shall end when Boeing submits a notification to Ecology, in writing or electronic mail, that all construction activities related to the 777X project have been completed. This notification of completion shall contain a brief summary of any construction activities related to the 777X project that have not been included in a prior annual report.

IV. EQUIPMENT RESTRICTIONS

This PSD permit authorizes the construction of the new and modified equipment associated with the 777X project, as listed in Table IV-1. However, Boeing may choose not to construct all the listed equipment.

Table IV-1. New and Modified Equipment Associated with the 777X Project		
Unit ID	Equipment Description	New or Modified
WCF-2	Gas-fired heater for liquid nitrogen vaporization unit	New
WCF-3a	Gas-fired process heater for autoclave #1	New
WCF-3b	Gas-fired process heater for autoclave #2	New
WCF-3c	Gas-fired process heater for autoclave #3	New
WCF-4	Vacuum pump(s) servicing autoclaves	New
WCF-6a	Wing panel wash stall #1	New
WCF-6b	Wing panel wash stall #2	New
WCF-6c	Wing spar and stringer wash stall #1	New
WCF-6d	Wing spar and stringer wash stall #2	New
WCF-7	Gas-fired plasma unit for treatment of wing panel stringers	New
WCF-8a	Up to two (2) Wing panel prep booth(s) (abrasive blast/sanding, solvent hand-wipe, edge seal)	New
WCF-8b	Wing spar prep booth (abrasive blast/sanding, solvent hand-wipe, edge seal)	New
WCF-9a	Wing panel spray booth #1	New
WCF-9b	Wing panel spray booth #2	New
WCF-9d	Wing panel spray booth #3	New
WCF-9c	Wing spar spray booth #1	New
WCF-9e	Wing spar spray booth #2	New
WCF-10a	Wing panel primer curing booth #1	New
WCF-10b	Wing panel primer curing booth #2	New
WCF-10c	Wing spar primer curing booth	New
WCF-11a	Small quantity paint mix booth #1	New
WCF-11b	Small quantity paint mix booth #2	New
WCF-11c	Small quantity paint mix booth #3	New
WCF-11d	Small quantity paint mix booth #4	New
WCF-12a	Coating equipment cleaning booth #1	New
WCF-12b	Coating equipment cleaning booth #2	New
WCF-12c	Coating equipment cleaning booth #3	New
WCF-12d	Coating equipment cleaning booth #4	New
WCF-14	Up to four (4) Wing spar seal booth(s)	New
WBSP-1a	Robotic wing spray booth for left hand wing	Modified
WBSP-1b	Robotic wing spray booth for right hand wing	Modified
WBSP-2	Forward body section spray booth	Modified
WBSP-3	Mid body section spray booth	Modified
WBSP-4	Aft body section spray booth	Modified
WBSP-6	Forward body section corrosion-inhibiting compound spray booth	Modified
WBSP-7	Mid body section corrosion-inhibiting compound spray booth	Modified
WBSP-8	Aft body section corrosion-inhibiting compound spray booth	Modified

Table IV-1. New and Modified Equipment Associated with the 777X Project		
Unit ID	Equipment Description	New or Modified
WBSP-10	Vertical fin hybrid laminar flow control prep booth	New
WBSP-11a	Vertical fin hybrid laminar flow control spray booth #1	New
WBSP-11b	Vertical fin hybrid laminar flow control spray booth #2	New
WBSP-11c	Vertical fin hybrid laminar flow control spray booth #3	New
AA-2a	Wing stub spray coating enclosure #1	New
AA-2b	Wing stub spray coating enclosure #2	Modified
F-1	Combustion equipment for comfort or process heating not otherwise identified elsewhere in this table; multiple units, most of which will be less than 5 MMBtu/hr, and all of which will be less than 10 MMBtu/hr	New
F-2a	Up to nine (9) 2,750-kW diesel generators	New
F-2b	Up to two 750-kW diesel generators	New
IRC-1a	Adhesive spray booth #1	New
IRC-1b	Adhesive spray booth #2	New
IRC-1c	Adhesive spray booth #3	New
IRC-2	Paint spray booth	New
IRC-3	Crushed core press	New

V. EMISSION LIMITS

1. Consistent with requirements of 40 CFR § 52.21(j)(3), the following limitations apply to VOC emissions from the Boeing 777X project:
 - a. This permit hereby amends the VOC emission limit from wing cleaning and coating operations in the 777 robotic wing laydown spray booths and the nonrobotic southwest wing laydown spray booth in Building 40-37 in Approval Condition IV.A3. of PSD-11-01 from 34 tons per year (tpy) to 59 tpy in any twelve (12) consecutive months and in Approval Condition IV.A.2. of PSD-11-01 from 0.17 tons per wing to 0.24 ton per wing.
 - b. This permit hereby amends the VOC emission limit from wing cleaning and coating operations in the 777 robotic wing laydown spray booths and the nonrobotic southwest and southeast wing laydown spray booths in Building 40-37 in Approval Condition IV.B of PSD-11-01 from 36.3 tpy to 61.3 tpy in any twelve (12) consecutive months.
 - c. This permit hereby amends the 777 assembly operations VOC emission limit in Approval Condition 3.1 of PSD-91-06 from 238.8 tpy to 513 tpy in any twelve (12) consecutive months. For purposes of demonstrating compliance with Approval Condition 3.1 of PSD PSD-91-06, all 777X related production operations in Building 40-58 are considered part of 777 assembly operations.

- d. This permit hereby amends the Interiors Manufacturing VOC emission limit in Approval Condition 4 of PSD-05-02 from 205 tpy to 239 tpy in any (12) consecutive months.
 - e. VOC emission from 777X wing component fabrication operations in Building 40-58 must not exceed 1.73 tons per completed shipset of 777X wing components, on a 12-month rolling average.
 - f. As used in this PSD permit, VOC means any compound defined as VOC in 40 CFR § 51.100(s).
2. Boeing shall limit the increase in non-VOC criteria pollutant emissions resulting from the 777X project as follows:

NO _x :	39 tpy
CO:	99 tpy
CO _{2e} :	74,000 tpy
PM _{2.5} :	9 tpy
 3. Boeing Everett shall limit natural gas usage from the new 777X project combustion emission units listed in Table VI-1 below to 1,000,000 MMBtu per calendar year. The annual natural gas usage must be reported to PSCAA in writing or electronic mail, postmarked or received by June 15 of the following year.

VI. BACT EMISSION LIMITS

A. BACT for VOC Coatings Operations:

For cleaning and coating operations in the new and modified 777X spray booths, prep booths, and seal booths, the Boeing Everett facility must comply with all applicable VOC emission standards of the Aerospace NESHAP in 40 CFR 63 Subpart GG, as in effect on July 1, 2014. These requirements are described in more detail in Condition VII.A below.

B. BACT for Natural Gas Operations:

Boeing is required to use good combustion practices as BACT for VOC emissions from the proposed new natural gas combustion units listed in Table VI-1.

Table VI-1. Proposed Natural Gas Combustion Units

10–50 MMBtu/hr

Unit ID (from Table IV-1)	Description
WCF-3a	Gas-fired process heater for autoclave #1
WCF-3b	Gas-fired process heater for autoclave #2
WCF-3c	Gas-fired process heater for autoclave #3
WCF-9a	Space heating - wing panel spray booth #1
WCF-9b	Space heating - wing panel spray booth #2
WCF-9d	Space heating - wing panel spray booth #3
WBSP-11a	Space heating - vertical fin HLFC spray booth #1
WBSP-11b	Space heating - vertical fin HLFC spray booth #2
WBSP-11c	Space heating - vertical fin HLFC spray booth #3

5–10 MMBtu/hr

Unit ID (from Table IV-1)	Description
F-1	Combustion equipment for comfort or process heating not otherwise identified elsewhere in this table; multiple units, most of which will be less than 5 MMBtu/hr, and all of which will be less than 10 MMBtu/hr
WCF-2	Gas-fired heater for liquid nitrogen vaporization unit (if this option is chosen to supply autoclaves with nitrogen)
WCF-10a	Space heating - wing panel primer curing booth #1
WCF-10b	Space heating - wing panel primer curing booth #2

2–5 MMBtu/hr

Unit ID (from Table IV-1)	Description
WBSP-10	Space heating - vertical fin HLFC prep booth
WCF-9c	Space heating - wing spar spray booth
WCF-9e	Space heating - wing spar spray booth
WCF-8a	Space heating - wing panel prep booth
WCF-14	Space heating - wing spar seal booth

<2 MMBtu/hr

Unit ID (from Table IV-1)	Description
WCF-7	Gas-fired plasma unit for treatment of wing panel stringer
WCF-10c	Space heating - wing spar primer curing booth

Unit ID (from Table IV-1)	Description
WCF-6a	Space heating - wing panel wash stall #1
WCF-6b	Space heating - wing panel wash stall #2
WCF-8b	Space heating - wing spar prep booth
WCF-6c	Space heating - wing spar and stringer wash stall #1
WCF-6d	Space heating - wing spar and stringer wash stall #2

C. BACT for Emergency Generators:

This permit for the 777X project authorizes up to nine 2,750-kW diesel emergency generators for the autoclaves in Building 40-58, and up to two 750-kW diesel emergency generator for other emergency backup power needs in Building 40-58.

Boeing is required to meet the emergency generator requirements for VOC emissions contained in 40 CFR 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. These standards require emergency diesel engines of the size for the 777X project to comply with the Tier 2 emission standards for VOC emissions in 40 CFR 89.112, which are 6.4 g/kWh for VOC and NO_x combined. Compliance with the VOC emission standards will be determined by maintaining the engine according to manufacturer's recommendation, and an EPA issued emissions certificate which certifies that the engine complies with EPA Tier 2 emission rates. The operating requirements for emergency stationary internal combustion engines are provided in 40 CFR 60, Subpart IIII, which limit non-emergency use of each engine to 100 hours per year per engine.

VII. SPECIFIC OPERATING REQUIREMENTS

- A. For cleaning and coating operations in the new and modified 777X spray booths, prep booths, and seal booths, Boeing Everett must comply with all applicable VOC emission standards of the Aerospace NESHAP, 40 CFR Part 63, Subpart GG (as in effect on July 1, 2014), including but not limited to the following requirements, as applicable:
1. Cleaning solvent laden cloth, paper, or any other absorbent applicators used for cleaning will be deposited in bags or other closed containers upon completing their use to the extent required by 40 CFR § 63.744(a)(1).

2. Fresh and spent cleaning solvents, except semi-aqueous solvent cleaners as defined in 40 CFR § 63.742 must be stored in closed containers to the extent required by 40 CFR § 63.744(a)(2).
3. Conduct the handling and transfer of cleaning solvents to or from enclosed systems and other cleaning operation equipment that hold or store fresh or spent cleaning solvents in a manner that minimizes spills to the extent required by 40 CFR § 63.744(a)(3).
4. Hand wipe cleaning solvents must comply with 40 CFR § 63.744(b):
 - a. A VOC composite vapor pressure not greater than 45 mm Hg at 20°C; or
 - b. The composition requirements in Table 1 of 40 CFR § 63.744.
5. To the extent required by 40 CFR § 63,744(d), when conducting flush cleaning operations subject to 40 CFR Part 63, Subpart GG (excluding those in which the cleaning solvents used either meet the composition requirements in Table 1 of 40 CFR § 63.744 or are semi-aqueous as defined in 40 CFR § 63.742), Boeing shall empty the used cleaning solvent each time aerospace parts or assemblies, or components of a coating unit (with the exception of spray guns) are flush cleaned into an enclosed container or collection system that is kept closed when not in use or into a system with equivalent emission control.
6. The VOC content level in primers and topcoats must meet the following requirements:
 - a. Exterior primers: Not greater than 5.4 lb VOC per gallon, as applied, less water and exempt solvents to the extent required by 40 CFR § 63.745(c)(2).
 - b. All other primers: Not greater than 2.9 lb VOC per gallon as applied, less water and exempt solvents to the extent required by 40 CFR § 63.745(c)(4).
 - c. Topcoats: Not greater than 3.5 lb VOC per gallon, as applied, less water and exempt solvents to the extent required by 40 CFR § 63.745(c)(4).

7. To the extent required by 40 CFR § 63.745(f)(1), spray applied primers and topcoats for wings must be applied using High Volume Low Pressure (HVLP), electrostatic, or other spray coating application methods, as approved by Ecology and/or PSCAA as specified in Condition III.A., with a transfer efficiency equivalent to or greater than HVLP or electrostatic spray application methods.
8. To the extent required by 40 CFR § 63.744(c), spray guns and hoses will be cleaned by one or more of the methods specified below, or equivalent methods that are approved by Ecology and/or PSCAA as specified in Condition III.A:
 - a. Enclosed system to the extent required by 40 CFR § 63.744(c)(1):
 - i. Clean the spray gun in an enclosed system that is closed at all times except when inserting or removing the spray gun.
 - ii. Cleaning must consist of forcing solvent through the gun.
 - b. Non-atomized cleaning to the extent required by 40 CFR § 63.744(c)(2):
 - i. Clean the spray gun by placing cleaning solvent in the pressure pot and forcing it through the gun with the atomizing cap in place.
 - ii. No atomizing air is to be used.
 - iii. Direct the cleaning solvent from the spray gun into a vat, drum, or other waste container that is closed when not in use.
 - c. Disassembled spray gun cleaning to the extent required by 40 CFR § 63.744(c)(3):
 - i. Disassemble the spray gun and clean the components by hand in a vat, which must remain closed at all times except when in use; or
 - ii. Soak the components in a vat, which must remain closed during the soaking period and when not inserting or removing components.
 - d. Atomized cleaning to the extent required by 40 CFR § 63.744(c)(4):
 - i. Clean the spray gun by forcing the cleaning solvent through the gun.

- ii. Direct the resulting atomized spray into a waste container that is fitted with a device designed to capture the atomized cleaning solvent emissions.
- B. In addition to complying with the VOC emission standards of the Aerospace NESHAP, 40 CFR Part 63, Subpart GG (as in effect on July 1, 2014), cleaning solvent for all cleaning and coating operations in the new and modified 777X spray booths, prep booths, and seal booths must comply with the following requirements:
 1. All wing panel and wing spar cleaning solvents must be applied either manually or by low pressure applicators, except in the following situations:
 - a. Cleaning intricate surfaces;
 - b. Where access is limited to the extent that using a low pressure applicator is infeasible;
 - c. Use of a cleaning solvent that either meets the composition requirements in Table 1 of 40 CFR § 63.744 or meets the definition of a semi-aqueous cleaning solvent as defined in 40 CFR § 63.742 (as in effect on July 1, 2014).
 2. Solvent used for hand wiping inside of fuel cells, fuel tanks, and confined spaces must have a VOC composite vapor pressure not greater than 72 mm Hg at 20°C.

VIII. COMPLIANCE MONITORING REQUIREMENTS

- A. Boeing must monitor compliance with Condition V.1.a. and V.1.b. by complying with the compliance monitoring requirements in Condition VI.A of PSD 11-01.
- B. Boeing must monitor compliance with Condition V.1.c. by complying with the compliance monitoring requirements in Condition 15 of PSD 91-06.
- C. Boeing must monitor compliance with Condition V.1.d. by complying with the compliance monitoring requirements in Condition 6 of PSD 05-02.
- D. Beginning the first calendar month that production operations begin in Building 40-58, Boeing must monitor compliance with Condition V.1.e. as follows:
 1. Quantify the amount of each VOC-containing material used in each calendar month in the 777X wing component fabrication operations in Building 40-58 and calculate the corresponding total consumption over the previous twelve (12) consecutive months. For this calculation, the amount of each VOC-

containing material used in the 777X wing component fabrication operations in Building 40-58 during the eleven (11) months prior to the first month in which production operations begin in Building 40-58 will be considered zero.

2. Determine VOC content of each VOC-containing material from the corresponding Material Safety Data Sheets (MSDS) or other data supplied by the material's manufacturer, or other method approved by Ecology and/or PSCAA.
 3. Calculate the monthly VOC emissions from each VOC-containing material used in the 777X wing component fabrication operations in Building 40-58 by multiplying the VOC content of each material as obtained in Condition VIII.D.2. by the amount of that material used during the month as obtained in Condition VIII.D.1, then sum the monthly total VOC-emissions from all VOC containing materials used over the previous twelve (12) consecutive months.
 4. Quantify the total number of 777X wing component shipsets completed in Building 40-58 over the previous twelve (12) consecutive months. Verify compliance with Condition V.1.e. by dividing the twelve (12) consecutive month total VOC emissions as obtained in Condition VIII.D.3. by the total number of 777X wing component shipsets completed in Building 40-58.
 5. Boeing may deduct from the total VOC emissions calculated:
 - a. Any VOCs that are included in the coating formulation as reactive components to the extent that they are incorporated into the final wing coating as verified by the coating's manufacturer documentation.
 - b. Any VOCs recovered for reuse, recycling or disposal, or discharged from Boeing Everett to wastewater or solid waste, from materials used in the 777X wing component fabrication operations in Building 40-58.
- E. Beginning the first calendar month that any of the new and modified 777X spray booths, prep booths, or seal booths are first used, Boeing must monitor compliance with conditions VII.A.1. through VII.A.5., VII.A.7., VII.A.8., and VII.B by:
1. Conducting inspections of the work practice activities in the new and modified 777X spray booths, prep booths, or seal booths at least once per calendar year.
 2. Work practices will be randomly sampled during each inspection, and observed for consistency with permit requirements.

3. To monitor compliance with Condition VII.A.4.a. and VII.B.2., Boeing must determine, as applicable, each cleaning solvent's VOC composite vapor pressure in accordance with:
 - a. 40 CFR § 63.750(b)(1) for single component solvents (as in effect on July 1, 2014); or
 - b. The equation in 40 CFR § 63.750(b) (2) for blended solvents (as in effect on July 1, 2014).
 4. To monitor compliance with Condition VII.A.4.b., Boeing must determine, as applicable, each cleaning solvent's composition in accordance with 40 CFR § 63.750(a) (as in effect on July 1, 2014) or by another method approved by Ecology and/or PSCAA.
- F. Beginning the first calendar month that any of the new or modified 777X spray booths, prep booths, or seal booths are first used for cleaning and coating, Boeing must monitor compliance with Condition VII.A.6. by determining the VOC content (less water and exempt solvents) for each affected coating from the MSDS or other data supplied by the manufacturer, or by another method approved by Ecology and/or PSCAA as specified in Condition III.A.
- G. Boeing must monitor compliance with Condition V.2 by complying with the requirements in WAC 173-400-720(4)(b)(iii)(D).

IX. RECORDKEEPING AND REPORTING REQUIREMENTS

- A. Beginning the first calendar month that any of the 777X production begins, Boeing must keep the following records at the site (or electronically accessible at the site):
1. Number of 777X wing component shipsets completed in Building 40-58 in the previous twelve (12) consecutive month period.
 2. The calculations and results pursuant to Condition VIII.D.
 3. An annually updated list of all VOC containing materials used in the 777X wing component fabrication operations in Building 40-58 within the immediate past twelve (12) months. For the purpose of this record, the immediate past twelve (12) months shall not include any month prior to the month that production operation began in Building 40-58.
 4. For material containing VOCs that were deducted as reactive VOCs, the manufacturer documentation verifying the quantity of reactive VOC incorporated into the final wing coating.

5. For VOCs that were deducted as waste, inventory records verifying the quantity of VOCs recovered for reuse, recycling or disposal, or discharged from Boeing Everett to wastewater or solid waste, from materials used in the 777X wing component fabrication operations in Building 40-58.
- B. Records must be retained for not less than five (5) years after their origination.
1. At a minimum, the most recent two (2) years of data must be retained onsite (or be electronically accessible at the site). The remaining three (3) years of data may be retained offsite.
 2. Records must be available for inspection by Ecology and PSCAA within ten (10) days of request.
- C. Beginning the first calendar year after 777X production operations begin in Building 40-58, Boeing must report in writing or electronic mail, postmarked or received by June 15 of each year, the following information to Ecology and/or PSCAA.
1. The types and corresponding monthly and rolling 12-month total quantities of VOC containing materials used in the 777X wing component fabrication operations in Building 40-58 for the previous calendar year.
 2. The quantity of VOCs in the VOC containing materials reported.
 3. For VOCs that were deducted, the monthly and rolling 12-month total quantity of reactive VOCs incorporated into the final coating for the previous calendar year.
 4. For VOCs that were deducted, the monthly and rolling 12-month total quantity of VOCs recovered for reuse, recycling or disposal, or discharged from Boeing Everett to wastewater or solid waste, from materials used in the 777X wing component fabrication operations in Building 40-58 for the previous calendar year.
- D. Boeing must keep records and submit reports with regard to Condition V.2 as specified in WAC 173-400-720(4)(b)(iii)(D).

X. GENERAL RESTRICTIONS ON FACILITY OPERATIONS

- A. At all times, Boeing must, to the extent practicable, maintain and operate the 777X spray and sealing booths, including any associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

- B. Determination of whether acceptable operating and maintenance procedures are being used for the 777X spray and sealing booths will be based on information available to Ecology, PSCAA, EPA and/or their authorized representatives, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

XI. MALFUNCTION AND EXCESS EMISSIONS REPORTING

- A. Prior to incorporation of the conditions of this PSD permit into Boeing's Title V Air Operating Permit issued pursuant to 40 CFR Part 70 and WAC 173-401, Boeing must report to Ecology and PSCAA, in writing or electronic mail, following the discovery of any malfunction of air pollution control equipment, process equipment, or of a process, which results in an increase in VOC emissions above the allowable emission limits of this permit, in accordance with WAC 173-400-107 and the following conditions:
 - 1. Boeing must notify Ecology and PSCAA, in writing or electronic mail, postmarked or received no later than thirty (30) days after the end of the month in which a malfunction is discovered, for any malfunction of air pollution control equipment, process equipment, or of a process, which results in an increase in emissions above the allowable emission limits of this permit. This notification must include a description of the malfunctioning equipment, process equipment or process, the date and time of the initial malfunction (if known), the period of time over which emissions were increased due to the malfunction, the cause of the malfunction (if known), the estimated resultant excess emissions, and the methods utilized to mitigate emissions and restore normal operations.
 - 2. For purposes of this permit, "malfunction" means any failure of air pollution control equipment, process equipment, or of a process to operate in a normal manner.
- B. After the conditions of this PSD permit have been incorporated into Boeing's Title V Air Operating Permit issued pursuant to 40 CFR Part 70 and WAC 173-401, Boeing shall report to PSCAA the discovery of any malfunction of air pollution control equipment, process equipment, or of a process, which results in an increase in emissions above the allowable emission limits specified in this permit, pursuant to the deviation reporting requirements and, if applicable, pursuant to the unavoidable excess emissions reporting requirements of that Title V Air Operating Permit.
- C. Compliance with the malfunction notification requirements, as applicable, will not excuse or otherwise constitute a defense to any violation of this PSD permit or any law or regulation such malfunction may cause.

XII. RIGHT OF ENTRY

Section 114 of the federal Clean Air Act, 42 U.S.C. § 7414, and the Revised Code of Washington (RCW) 70.94.200, and WAC 173-400-105(3) provide authorized representatives of EPA, Ecology, and PSCAA certain rights to enter and inspect the source. Refusal by Boeing to allow such entry and inspection may be a violation of the federal Clean Air Act and/or the RCW subject to penalty as provided in those statutes. Pursuant to these statutes, authorized representatives of EPA, Ecology, and PSCAA, upon the presentation of credentials:

- A. Have a right of entry to, upon, or through any premises of Boeing or any premises in which any records this permit requires Boeing to maintain are located.
- B. Have the right, at reasonable times, to access and copy any records this permit requires Boeing to maintain.
- C. Have the right, at reasonable times, to inspect any monitoring equipment or method required by this permit.
- D. Have the right, at reasonable times, to sample any emissions that Boeing is required to sample under this permit.

XIII. TRANSFER OF OWNERSHIP

- A. In the event of any changes in control or ownership of facilities to be constructed, this PSD permit will be binding on all subsequent owners and operators. The applicant must notify the succeeding owner and operator of the existence of this PSD permit and its conditions by letter, a copy of which must be forwarded to Ecology and/or PSCAA as specified in Condition III.A.
- B. If the conditions of this PSD permit have been incorporated into Boeing Everett's Title V Air Operating Permit issued pursuant to 40 CFR Part 70 and WAC 173-401, then the provisions for amending that Title V Air Operating Permit to allow for a change in ownership or operational control shall apply in place of the notification provisions in Condition XIII.A.

XIV. ADHERENCE TO APPLICATION AND COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS

- A. Pursuant to 40 CFR § 52.21(r) (1), Boeing must construct and operate the proposed emissions units in accordance with this PSD permit and the application on which this permit is based.

- B. Pursuant to 40 CFR § 52.21(r)(3), this PSD permit shall not relieve Boeing of the responsibility to comply fully with applicable provisions of the State Implementation Plan and any other requirements under local, state, or federal law.
- C. Any applicant who fails to submit any relevant facts or who has submitted materially incorrect relevant information in a permit application must, upon becoming aware of such failure, or incorrect submittal, promptly submit such supplementary facts or corrected information.
- D. To the extent provided by 40 CFR § 52.12(c), for the purpose of establishing whether or not Boeing has violated or is in violation of any requirement of this permit, nothing in this permit shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether Boeing would have been in compliance with applicable requirements if the appropriate performance or reference test or procedure had been performed.

XV. APPEAL PROCEDURES

This PSD permit, or any conditions contained in it, may be appealed to:

- A. The Pollution Control Hearings Board (PCHB) as provided in Chapter 43.21B RCW and Chapter 371-08 WAC.

ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
Boeing Everett	The Boeing Company, Boeing Commercial Airplanes–Everett Facility
CFR	Code of Federal Regulations
CEMS	Continuous Emissions Monitoring System
CO	carbon monoxide
CO ₂ e	carbon dioxide equivalents
EAB	Environmental Appeals Board
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
gal	gallon(s)
GHG	greenhouse gases
H ₂ SO ₄	sulfuric acid mist
HVLP	High Volume Low Pressure
kW	kilowatt
lb	pound(s)
lb/hr	pound(s) per hour
mm Hg	millimeters of mercury column
MMBtu/hr	million British thermal units per hour
MSDS	Material Safety Data Sheet
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO _x	nitrogen oxides
NWCAA	Northwest Clean Air Agency
O ₂	oxygen
PCHB	Pollution Control Hearings Board
PM	particulate matter
PM ₁₀	particulate matter less than 10 micrometers in diameter
PM _{2.5}	particulate matter less than 2.5 micrometers in diameter

ppm	parts per million
ppmv	parts per million by volume
ppmvd	parts per million by volume on a dry basis
PSCAA	Puget Sound Clean Air Agency
PSD	Prevention of Significant Deterioration of Air Quality
RCW	Revised Code of Washington
scf	standard cubic feet
SCR	selective catalytic reduction
tpy	tons per year
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
WAC	Washington Administrative Code