

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection**

P060371788

FACILITY: Williams International CO., LLC.	SRN / ID: P0603
LOCATION: 2000 CENTERPOINT PARKWAY, PONTIAC	DISTRICT: Warren
CITY: PONTIAC	COUNTY: OAKLAND
CONTACT:	ACTIVITY DATE: 02/06/2024
STAFF: Iranna Konanahalli	COMPLIANCE STATUS: Compliance
SUBJECT: Scheduled FY 2024 Inspection (on-site) of Williams International ("Williams") located at 2000 Centerpointe Pkwy., Pontiac, MI 48341-3146.	
RESOLVED COMPLAINTS:	

**Williams International (P0603)
2000 Centerpointe Pkwy.
Pontiac, MI 48341-3146**

Address change: Street number was changed by City of Pontiac in 2017: This street address 2000 Centerpointe Pkwy. used to be **1999 Centerpointe Pkwy.** EGLE-AQD must associate this new address, **2000 Centerpointe Pkwy.**, with **SRN P0603**. The location and the building are still the same as before and process equipment has never been moved or relocated.

Contacts:

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- 2. Steve Trombat** (Phone: 248-624-5200-Ext. 2206; E-mail: sTrombat@Williams-Int.com), Engineering Launch Manager
- 3. Tom Littlefield** (Phone: 248-624-5200-Ext. 2550; E-mail: tLittlefield@Williams-Int.com), Director of Facilities Engineering
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8. **Bryce Chandler** (Phone: 248-624-5200-Ext. 1703; E-mail: bChandler@Williams-Int.com), HVAC Maintenance Technician

9. Hailey Blasdell (Phone: NA; E-mail: hBlasdell@Williams-Int.com), Materials Science Engineering Specialist,

Active Permit: PTI No. 42-23 (App-2022-0242) dated March 17, 2023, for fabricated metal treatment operation, including plating, carburizing, and nitriding.

Voided Permits: the following permits have been voided and consolidated into PTI No. **4223**:

1. **PTI No. 25-22** (App-2021-0324) dated March 14, 2022, for nickel (Ni) plating line controlled by a packed bed wet scrubber using pH-controlled water using NaOH (sodium hydroxide). The packed bed scrubber (MAPCO) controls of acid and nickel emissions. Nickel (Ni) emissions are based on the 0.63 grains/A-hr emission factor.
2. **PTI No. 34-22** (App-2021-0253) dated March 31, 2022, for a nitric acid-etch line with rust prevent tank. The acidic emissions are controlled by a 1,000 CFM water scrubber. However, the rust prevent tank (Rustlick™ 606, Moisture-absorbing rust preventative, Flash point: 174.2 °F (79.0 °C) Pensky-Martens Closed Cup) emits into the in-plant environment.

On **February 06, 2024**, I conducted a level-2 **Scheduled FY 2024 Inspection (on-site)** of Williams International ("Williams") located at 2000 Centerpointe Pkwy., Pontiac, MI 48341-3146. The inspection was conducted to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994, PA 451; Michigan Department of Environment, Great Lakes and Energy, Air Quality Division (EGLE-AQD) administrative rules; and the consolidated permit (PTI No. **42-23**). This air emissions source is uniquely identified by the Air Quality Division with the State Registration Number (SRN) of **P0603** (R 336.1119(m) Definitions: S. Stationary source) under US EPA tripartite test.

During the inspection, **Dave Holden**, Sr. Safety and Security Specialist, **Steve Trombat**, Engineering Launch Manager, **Tom Littlefield**, Director of Facilities Engineering, and **Jim Hertel**, Safety and Security Specialist, Collin Hartman, Lead Engineer, **Michael Greeley**, Engineer, **Emily Eggart**, Machine Maintenance Technician, and **Bryce Chandler**, HVAC Maintenance Technician, assisted me.

Founded in 1955, by Dr. Sam B. Williams upon separating from Chrysler Corporation, as Williams Research Corporation (the company name changed to Williams International in 1981), Williams International ("Williams") provides jet-powered propulsion engineering, technology, and services. The privately-owned company, Williams, manufactures general aviation gas turbine engines. Williams' line of powerful, efficient gas turbine and turboprop engines are designed for trainer aircraft and private business jets, traditionally flown by piston engines. Williams' engines also supply industrial and military small-scale craft, such as drones used for naval gunnery practice. Its engines, also, propel high profile projects like Tomahawk cruise missiles and subsonic target drones. Guarding its market share, the engine builder also offers maintenance and aftermarket parts services. Williams has a product line covering from 1,000 to 3,600 pounds (lbf) of thrust.

Williams operates R&D (research and development) and R&O (repair and overhaul) out of the headquarters in Pontiac, Michigan. As a privately-owned company, Williams has a flexibility to focus on long-term goals with no Wall Street pressure.

PTI No. 42-23, Emission Units (EUs)

Emission Unit ID	Emission Unit Description	Installation Date / Modification Date	Flexible Group ID	
EU-01	A nitric acid etching line with a wet scrubber for control.	06/09/2023	FG-01	
This is known as NITAL process (a Common Process Found in Aerospace Manufacturing). MAPCO Model # MW-300 scrubber is used.				
EU-01RSTPRVNTDIP	A 15.6-gallon tank used as a rust prevention dip . Emissions are exhausted into the in-plant environment.	06/09/2023	FG-01	
One dip tank. RUSTLICK (Rustlick™ 606, Moisture-absorbing rust preventative, Flash point: (79.0 °C Pensky-Martens Closed Cup) is used. Both EU-01 (nitric acid etching line) & EU-01RSTPRVNTDIP (rust prevention dip) were previously covered by now voided PTI No. 34-22 .				
The nitric acid etching line is controlled by a wet (water) scrubber (Scrubber 01; Mapco Wet Air Scrubber 1,000 CFM). The rust prevention dip tank (totally enclosed) emissions are released into the in-plant environment.				
Similar scrubber but smaller size than the other Scrubber 02 (about 50%). The tanks are fully enclosed and hence no push-pull but only pull ventilation.				
Load station. Tank1 = Water wash with methanol. Tank2 = double rinse. Tank3 = HNO3 cleaning strip. Tank4 = DI Water rinse. Tank5 = Hot DI water rinse. Tank6 = HCl etch. Tank7 = DI water rinse. Tank8 = NaOH etch. Tank9 = NaOH rinse. Tank10 = DI water rinse. Tank11 = Chamber air flow. RUST Dip is outside the line.				
EU-02	A nickel (Ni) electroplating line consisting of two cleaning, one pickling, one hydrochloric acid etch, one Woods nickel strike, one nickel sulfamate, one nickel strip, and multiple rinse tanks. Several tanks in the line, as specified in Appendix A, are controlled by a packed bed wet scrubber system with pH control	04/14/2023	NA	
Controlled by Scrubber System: Ultrasonic Clean, Electro Clean, Tri-Acid Pickle, 50%HCl, Woods Nickel Strike, Sulfamate Nickel (2 tanks), Nickel Strip, Hot DI Rinse				
Not Controlled by Scrubber System: Ultrasonic Counter Flow, Ultrasonic Rinse, six (6) Counterflow Rinse stations.				
EU-02 (a nickel (Ni) electroplating line) was previously, permitted by PTI No. 25-22 dated March 14, 2022.				

The emissions are controlled by packed bed wet scrubber with pH control (Scrubber 02; MAPCO, Model #MW300). Nickel (Ni) emissions are based on the **0.63 grains/A-hr** emission factor.

EU-03	A copper/silver (Cu/Ag) plating line consisting of 36 total stations, including loading/unloading. Several tanks in the line, as specified in Appendix A, are controlled by a packed bed wet scrubber with pH control.	10/12/2022	NA	
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Tanks 4-5 = NaOH cleaners (2). Tanks 6-7 = RO water rinse tanks. Tank 8 = Hydrochloric Acid (HCl) etch. Tanks 9-10 = RO water rinse tanks. Tanks 11-13 = Not in use. Tanks 14-15 = Acid Cu plating. Tanks 16-17 = RO water rinse tanks. Tank 18 = Cyanide Cu. Tanks 19-20 = DI water rinse tanks. Tank 21 = Cyanide Ag. Tanks 22-23 = DI water. Tank 24 = Cyanide Ag. Tanks 25-26 = DI water rinse tanks. Tanks 27-29 = Not used. Tank 30 = Cu-Ag strip tank. Tanks 31-33 = DI water rinse tanks.

Controlled by Scrubber System: Soak Clean, Electro Clean, Hydrochloric Acid Pickle, Woods Nickel Strike, Copper Plate (2 tanks), Copper Strike/Flash, Silver Strike, Silver Strip (2 tanks), Copper Strip, Hot DI Rinse.

Not Controlled by Scrubber System: Rinse (15 tanks).

EO-03 (Cu/Ag plating line) is equipped with twin scrubbers (Scrubbers 03) in parallel: Cyanide Scrubber & Acid-base scrubber (pH ≈ 8.5 (8-10) adjusted with NaOH).

EU-04	Electric nitriding furnace using ammonia and equipped with a 17,000 BTU per hour afterburner to control ammonia. The furnace is a batch furnace with a 1,700-pound capacity.	06/10/2022	FG-04	
EU-04NH ₃	A 500-gallon anhydrous ammonia storage tank to provide ammonia to EU-04.	06/10/2022	FG-04	
EU-05	Electrically heated carburizing oven using acetylene.	TBD	NA	

Carburizing process involves adding carbon (C) to steel surface to harden steel at the surface. The oven is heated to 1,700 °F. Acetylene (C₂H₂) is capable of producing the hottest flame (theoretical adiabatic flame temperature) of all other gases. Acetylene is a source of carbon (C) for this process.

The process is still under testing. The production has not started.

EU-06	An anodizing/Alodine plating line consisting of 43 stations, including loading/unloading stations. Several tanks in the line, as specified in Appendix A, are controlled by a packed bed wet scrubber with pH control.	09/18/2023	NA	
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Anodizing/Alodine aluminum (Al) parts: Stations 1-2 = only carts. Tank 3 = Alkaline cleaner. Tank 4 = DI water. Tank 5 = Anodal etch tank. Tanks 6-7 = DI water. Tank 8 = Anodal Deox. Tank 9 = Not in use. Tanks 10-11 = DI water. Tank 12 = Tri-valent chrome (Cr³⁺). Tanks 13-14 = DI water. Tank 15 = Not in use. Tanks 16-18 = Sulfuric acid (H₂SO₄) anodizing. Tanks 19-20 = DI water. Tank 21 = Nitric acid (HNO₃). Tanks 22-23 = DI water. Tank 24 = Blue dye. Tank 25 = DI water. Tank 26 = Black dye. Tank 27 = DI water. Tank 28 = Seal dye parts. Tank 29 = Seal non-dye parts. Tank 30 = DI water. Tank 31 = Seal for chrome (Cr). Tanks 32-33 = DI water. Tank 34 = Hot water soap.

Controlled by Scrubber System: Alkaline Clean, Etch, Casting Etch, Deoxidizer, Tri-Chrome, Anodize, Sulfuric Acid Anodize (2 tanks), Sulfuric Acid Hard Coat Anodize, Nitric Acid Dip, Blue Dye, Black Dye, Clear/Blue Seal, Black Seal, Alodine Seal. This is the largest scrubber at the facility.

Not Controlled by Scrubber System: Rinse (10 tanks). Hot Seal Soak.

Unless stated otherwise, each tank with emissions in all processes (EUs) is equipped with **push-pull capture system** for eventual control by a corresponding scrubber system. Each scrubber has its own Total Preventative Maintenance System (TPMS).

All scrubbers are Mapco Wet Air Scrubbers. In all, there are five (5) scrubbers of different capacity, i.e. gas and liquid flow rates. Each scrubber follows practically identical MAP with different operating ranges for pH (normally pH = 8-10), liquid & gas flow rates, pressure differential (ΔP), etc. All these operating variables are recorded using MS Excel Spreadsheet as a part of recordkeeping. Each scrubber is MAPCO Model #MW300.

PTI No. 42-23 Compliance

PTI No. 42-23, EU-02

EU-02: A nickel (Ni) electroplating line consisting of two cleaning, one pickling, one hydrochloric acid etch, one Woods nickel strike, one nickel sulfamate, one nickel strip, and multiple rinse tanks. Several tanks in the line, as specified in Appendix A of the permit, are controlled by a packed bed wet scrubber system with pH control (pH = 8-10).

Control: Packed bed wet scrubber with pH control (Scrubber 02)

PTI No. 42-23, EU-02, III (Ni)

Williams submitted malfunction abatement plan (MAP).

FY24 Inspection Readings:

1. Pressure differential (ΔP): 3 inches of water (MAP: 2.2-3.2)
2. Liquid flow rate Rotameter reading: 51.2 gallons per minute (GPM) (MAP: 47-57)
3. pH: 8.94 (MAP: 8-10)

PTI No. 42-23, EU-02, IV (Ni)

Packed bed scrubber system is installed, maintained, and operated properly. ΔP , Rotameter, pH readings are recorded and logged using MS Excel Spreadsheet. The readings are in acceptable ranges per MAP.

PTI No. 42-23, EU-02, VI (Ni)

Pressure drop (ΔP), scrubber water pH level, and scrubber water flow rate for the packed bed scrubber system are logged using MS Excel Spreadsheet. The readings are verified by comparing with MAP values.

PTI No. 42-23, EU-02, VIII (Ni)

The emissions are discharged via SV-02.

PTI No. 42-23, EU-03

EU-03: A copper/silver (Cu/Ag) plating line consisting of 36 total stations, including loading/loading. Several tanks in the line, as specified in Appendix A, are controlled by a packed bed wet scrubber with pH control.

Control: A Packed bed wet scrubber system (twin scrubbers in parallel: Cyanide Scrubber & Acid-base Scrubber) with pH (8-10) control (Scrubber 03)

PTI No. 42-23, EU-03, III (Cu/Ag)

Williams submitted malfunction abatement plan (MAP).

PTI No. 42-23, EU-03, IV (Cu/Ag)

Packed bed scrubber system is installed, maintained, and operated properly. ΔP , Rotameter, pH readings are recorded and logged using MS Excel Spreadsheet. The readings are in acceptable ranges per MAP.

PTI No. 42-23, EU-03, VI (Cu/Ag)

FY24 Inspection Readings (Cu / Ag Cyanide):

1. Pressure differential (ΔP): Cu Scrubber = 3.5 & Ag Scrubber = 3.7 inches of water (MAP: 2.2-3.2)
2. Liquid flow rate Rotameter reading: Cu Scrubber = 29 & Ag Scrubber = 15 gallons per minute (GPM) (MAP: 47-57)
3. pH: 8.5 (MAP: 8-10)

PTI No. 42-23, EU-03, VIII (Cu/Ag)

The emissions are discharged via SV-03

PTI No. 42-23, EU-05

EU-5: Electrically heated **carburizing** oven (1,700 °F) using acetylene, which is a source of carbon.

Process has been installed but not operating yet.

Usage of acetylene is limited to 9,180 cubic meters of acetylene per 12-month rolling period. The usage corresponds to 11 tons of acetylene (VOC) emissions per 12-month rolling period.

PTI No. 42-23, EU-06

EU-6: An **anodizing/Alodine** plating line consisting of 43 stations, including loading/unloading stations. Several tanks in the line, as specified in Appendix A, are controlled by a packed bed wet scrubber with pH control.

Control: Packed bed wet scrubber with pH (8-10) control (Scrubber 06)

PTI No. 42-23, EU-06, III (anodizing/Alodine)

Williams submitted malfunction abatement plan (MAP).

PTI No. 42-23, EU-06, IV (anodizing/Alodine)

Packed bed scrubber system is installed, maintained, and operated properly. ΔP , Rotameter, pH readings are recorded and logged using MS Excel Spreadsheet. The readings are in acceptable ranges per MAP.

PTI No. 42-23, EU-06, VI (anodizing/Alodine)

FY24 Inspection Readings (anodizing/Alodine):

1. Pressure differential (ΔP): 3 inches of water (MAP: 2.2-3.2)
2. Liquid flow rate Rotameter reading: 71.2 gallons per minute (GPM) (MAP: 72)
3. pH: 8.95 (MAP: 8-10)

PTI No. 42-23, EU-06, VIII (anodizing/Alodine)

The emissions are discharged via SV-06

PTI No. 42-23, Flexible Groups (FGs)

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FG-01	A nitric acid etching line with a rust prevention dip tank. The nitric acid etching line is controlled by a wet scrubber and the rust prevention dip tank emissions are into the in-plant environment.	EU-01, EU-01RSTPRVNTDIP
Similar scrubber but smaller size than the other (about 50%). The tanks are fully enclosed and hence no push-pull but only pull ventilation. Load station. Tank1 = Water wash with methanol. Tank2 = double rinse. Tank3 = HNO ₃ cleaning strip. Tank4 = DI Water rinse. Tank5 = Hot DI water rinse. Tank6 = HCl etch. Tank7 = DI water rinse. Tank8 = NaOH etch. Tank9 = NaOH rinse. Tank10 = DI water rinse. Tank11 = Chamber air flow. RUST Dip is outside the line.		
FG-04	An electric nitriding furnace and associated anhydrous ammonia storage tank. The furnace has an afterburner to control ammonia emissions.	EU-04, EU-04NH ₃
Hailey Blasdel , Materials Science Engineering Specialist, assisted me with electric nitriding furnace. Nitriding involves adding nitrogen (N) to tool steel surface using electric heat at 900-1,000 °F. Ammonia (NH ₃), nitrogen-rich gas, is nitrogen source. Excess ammonia and hydrogen are burnt off using an afterburner.		

PTI No. 42-23, FG-01

FG-01 (EU-01, EU-01RSTPRVNTDIP): A **nitric acid etching line** with a **rust prevention** dip tank. The nitric acid etching line is controlled by a wet scrubber and the rust prevention dip tank emissions are into the in-plant environment.

Control: Wet Scrubber (Scrubber 01). The rust prevention dip tank (totally enclosed) emissions are released into the in-plant environment and, therefore, not controlled by the scrubber.

PTI No. 42-23, FG-01, III (nitric acid etching)

Williams submitted malfunction abatement plan (MAP).

PTI No. 42-23, FG-01, IV (nitric acid etching)

Packed bed scrubber system is installed, maintained, and operated properly. ΔP , Rotameter (flow rate), pH readings are recorded and logged using MS Excel Spreadsheet. The readings are in acceptable ranges per MAP.

PTI No. 42-23, FG-01, VI (nitric acid etching line)

FY24 Inspection Readings (nitric acid etching line):

1. Pressure differential (ΔP): 1.1 inches of water (MAP: 0.7-1.7)
2. Liquid flow rate Rotameter reading: 15 gallons per minute (GPM) (MAP: 14)
3. pH: 9 (MAP: 8-10)

PTI No. 42-23, FG-01, VIII (nitric acid etching)

The emissions are discharged via SV-01 (nitric acid etching)

PTI No. 42-23, FG-04

FG-04 (EU-04, EU-04NH₃): An electric nitriding furnace and associated anhydrous ammonia storage tank. The furnace has an afterburner to control ammonia emissions.

Control: EU-04 is equipped with an afterburner to control ammonia (NH₃) emissions.

The ammonia tank has a capacity of 500 gallons. First fill was on May 23, 2023. No fill after that. Emergency response plan has been submitted to Oakland County (63). Excess ammonia and hydrogen are burnt off using an afterburner (natural gas fired).

The nitriding emissions are discharged via SV-04 (EU-04, EU-04NH₃)

Miscellaneous PM processes

BAY9: R&D machining. The stand-alone machines equipped with cartridge filter (mist collectors)

BAY1: Mills (12) and lathes (8).

BAY2: Oil EDM (electro discharge machine). Mills (6). Automatic polishing cells. Deburring.

BAY3: Mills and lathes .

So on: BAY 4 thru 8.

Each machine is equipped with cartridge filter (mist collector) for particulate or mist control. Most machines use aqueous coolant. Each exhaust discharge is to in-plant environment.

The machines are exempt from Rule 336.1201 (Permit-to-Install) pursuant to Rule 336.1285 (2)(I).

CONCLUSION

Williams is in compliance with its permit (PTI No. **42-23**) and Clean Air Act. Repeat inspection may be necessary as some equipment is not yet operational and the processes have not yet achieved full potential.

NAME *J. S. Marshall* DATE 05-07-2024 SUPERVISOR *Joyce*