DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

P056530262

FACILITY: Shannon Precision, LLC		**SRN / ID:** P0565
LOCATION: 4425 Purks, AUBURN HILLS		**DISTRICT:** Southeast Michigan
CITY: AUBURN HILLS		**COUNTY:** OAKLAND
CONTACT: Scott Mayer , Plant Engineer		**ACTIVITY DATE:** 07/14/2015
STAFF: Francis Lim	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** Minor
SUBJECT:		
RESOLVED COMPLAINTS:		

On July 14, 2015, AQD staff conducted an inspection at Shannon Precision Fastener located at 4425 Purks Road, Auburn Hills. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) Administrative Rules; and the conditions of Permit-To-Install (PTI) No. 177-14. The other purpose of the inspection is to look at the heat treating line and locate exhaust stacks where the facility will test for VOC emissions. Scott Mayer, Plant Engineer assisted me during the inspection.

Shannon Precision is a manufacturer of metal fasteners primarily for the automotive industry. This facility only manufacture external threaded bolts (no internally threaded nuts). The fasteners are produced from coiled steel wires. The metal parts are cut to size and produced in the cold heading machines. Basically, the cut steel wire is placed in a die and "hammered" or "punched" to form the shape of the fastener. The cold headers are powered by motors driving a flywheel. The flywheel stores kinetic energy which is released during the hammering/punching operation. The machines are called cold heading because the steel wires are not preheated prior to forming (hot forging). The formed parts are then threaded in the threading machines. The cold heading machines and screw machines do not use any coolant oil. The heading machines use a little lubricant during the cold heading process. There are 6 cold heading machines and 6 threading machines.

Shannon Precision has a permit (PTI No. 177-14) for a heat treating equipment. The heat treating process alters the alloy distribution and transforms the soft alloy into a hard alloy. This slow heating process occurs at elevated temperatures in the hardening furnace. This temperature is below the critical temperature where the alloy turns into a molten metal. The alloy must be cooled fast enough to fully harden. This fast cooling is called quenching. The hard metal coming out of the hardening furnace (after quenching) is extremely brittle. If the alloy is put into service in this condition, most alloy steels would shatter. To prevent this, a process called tempering is conducted after the hardening process. As soon as the alloy steel has been quenched to about 125/150°F, it should be immediately tempered. The tempering process involves reheating the alloy at elevated temperatures in a tempering (sometimes called "draw") furnace. Tempering retains the hardness of the alloy, but will be less brittle.

The heat treating equipment at Shannon Precision is a continuous, conveyor-equipped heat treating line with integral oil quenching. The parts are transferred to a conveyor and undergo a pre wash in the heated alkaline wash tank. The parts are then fed to the hardening furnace where the parts are heated to 1500 -1650 F for approximately 45 minutes to an hour. Atmospheric gas containing very low oxygen is continuously introduced and maintains the atmosphere in the furnace. The atmospheric gas is flared as it exits the furnace. From the

hardening furnace, the parts are dropped to a below grade quench oil tank. The oil quenching "freezes" the steel into a different lattice structure. The parts are then transferred to another conveyor for a post wash (heated alkaline wash tank) and then fed to the tempering furnace. The parts are reheated for approximately 45 minutes to an hour at 720 to 1000 F. The water in the pre wash and post wash is maintained at 150 F.

An endothermic gas generator produces the furnace atmospheric gas. For this facility, the purpose of atmospheric gas is to "normalize" or protect the metal from chemical reactions at the surface. In other facilities, atmospheric gases can be used to create a chemical reaction in the surface of the metal (adding carbon, nitrogen).

PTI No. 177-14 has a VOC limit of 4.4 tpy, based on a rolling 12-month time period. There is an oil usage limit of 1250 gallons per year, based on a rolling 12-month period. Facility started normal operations on April 2015. Usage is below 1250 gallons and emissions are below 4.4 tpy. See attached records.

For the proposed stack test, Scott pointed out that the stack test will be conducted from a hooded exhaust stack just after the oil quenching. The oil quenching is done in a compartment at the hardening furnace. The flash off from the oil quench tank (when very hot metal is immersed in the oil quench tank) is flared, together with the atmospheric gas. The facility believes this stack will emit the most VOCs from the oil quench.

The main purpose of the stack test is to obtain an EF factor based on VOC emissions/tons metal processed. I will discuss with the facility that they should conduct a test on at least one more stack.

NAME [signature] DATE 7-17-15 SUPERVISOR CJE