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Livingston

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Reg. Applicability Determination

A293152226

FACILITY: DIAMOND CHROME PLATING INC		SRN / ID: A2931
LOCATION: 604 S MICHIGAN, HOWELL		DISTRICT: Lansing
CITY: HOWELL		COUNTY: LIVINGSTON
CONTACT: Celeste Holtz , Environmental Scientist		ACTIVITY DATE: 12/23/2019
STAFF: Daniel McGeen	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Review by AQD Lansing District of Rule 290 demonstration for use of NEXT 5408 solvent in BACT-72A vapor degreaser.		
RESOLVED COMPLAINTS:		

During the morning of 12/23/2019, the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD) conducted a review of the exemption demonstration for Diamond Chrome Plating, Inc.'s (DCP) BACT-72A vapor degreaser, which was received by AQD on the afternoon of Friday, 12/20/2019. The exemption demonstration was submitted to AQD by Ms. Celeste Holtz, Program Manager/Environmental Scientist for BB&E, DCP's environmental consulting firm. The purpose of the exemption demonstration was to demonstrate that use of a new solvent, NEXT® 5408, in the degreaser was exempt from the requirement of EGLE Michigan Air Pollution Control (MAPC) Rule 201 to obtain an air use permit, or permit to install, by meeting the exemption criteria of MAPC)Rule 290.

On 12/17/2019, I had called Ms. Holtz, and requested that AQD be sent a Rule 290 demonstration for the use of NEXT® 5408 in the current vapor degreaser. This solvent was to be a substitute for the use of trichloroethylene (TCE) in the degreaser. Ms. Holtz was out of the state at this time, but had verbally committed to following up on this. On 12/20/2019, she emailed to AQD the Rule 290 demonstration, which was dated 12/9/2019.

On the morning of 12/23/2019, I reviewed the information she submitted. The 12/9/2019 memorandum at the start of the exemption demonstration indicated that the use of the NEXT® 5408 solvent in the current vapor degreaser would satisfy the EGLE MAPC Rule 290 exemption criteria. It then gave an overview of the new solvent, NEXT® 5408.

NEXT® 5408 was said to be free of carcinogens. AQD has subsequently confirmed that the ingredients are not known to be carcinogens, based on available data. The product is also free of any currently listed Hazardous Air Pollutants (HAPs) from the U.S. Environmental Protection Agency's (EPA) list of HAPs. All 3 of the ingredients are toxic air contaminants (TACs). Subsequent to my review, the AQD Toxicologist Mike Depa reviewed data on the 3 ingredients of NEXT® 5408. Please refer to M. Depa's 1/31/2020 email to the AQD Lansing District Office, for a summary of his review.

NEXT® 5408 contains the three following ingredients:

- 50 to 70% 1,1,1,3,3-Pentafluorobutane; chemical abstract service (CAS) # 406-58-6. This is a VOC. It has no initial threshold screening level (ITSL).
- 25 to 50% 1,2 trans-dichloroethylene; CAS # 156-60-5. This is not a VOC. It has an ITSL of 200 micrograms per meters cubed (ug/m3).
- 1-8% 1,1,2,2-Tetrafluoroethyl 2,2,2-trifluoroethyl ether; CAS # 406-78-0. This is not a VOC. It has no ITSL.

Note: The above percentage ranges add up to over 100%. This is because the ranges given are broad, and do not disclose the actual percentage, due of the proprietary nature of the product. Therefore, the Rule 290 demonstration calculations use the highest percentage for each identified compound, representing a worst case scenario for estimating monthly emissions.

Surrogate ITSLs:

- Because 1,1,1,3,3-Pentafluorobutane (Pentafluorobutane) has no ITSL, AQD Toxicologist Mike Depa used an Air Contaminant Benchmark from Ontario, Canada, of 1,500 ug/m3 with a 24-hour averaging time as a surrogate ITSL, during his review of NEXT® 5408 (documented separately).
- Because 1,1,2,2-Tetrafluoroethyl 2,2,2-trifluoroethyl ether (Tetrafluoroethyl trifluoroethyl ether) has no

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ITSL, AQD's M. Depa used a surrogate ITSL of 4,000 ug/m³ over an 8-hour average, during his review of NEXT® 5408 (documented separately).

AQD does not grant or approve exemptions. Facilities are allowed to use exemptions for certain processes under EGLE's Michigan Air Pollution Control Rules without a formal approval from EGLE, if a process meets the exemption criteria.

Review under EGLE MAPC Rule 278, Exclusion from exemption:

In order to use one of the exemption rules, a facility must not be excluded by EGLE MAPC Rule 278.

EGLE MAPC Rule 278(1)(b) prohibits use of exemptions by any facility where there is a potential increase in actual emissions above *significance* levels, as defined in EGLE MAPC Rule 119. For VOCs, the significance level for an actual increase would be 40 tons per year (TPY). The exemption demonstration indicates that actual emissions from the degreaser using NEXT® 5408, even when combined with VOC emissions from natural gas-burning equipment at the plant, would only be 1.3 TPY, well below significance levels. Therefore, DCP is not prohibited by Rule 278(1)(b) from using an exemption, provided it can meet the criteria for that specific exemption.

EGLE MAPC Rule 278(2) next prohibits a *major source* of HAPs from using an exemption. Based the submitted data the degreaser using NEXT® 5408 is not classified as a major source of HAP emissions. A major source of HAPs has the potential to emit of 10 tons per year (TPY) or more of any single HAP, or 25 TPY or more of a combination of combined HAPs. DCP does not exceed these thresholds, and so is not prohibited by Rule 278(2) from using an exemption, provided it can meet the criteria for that specific exemption. Because it is not a major source of HAP emissions, DCP is classified as an *area source* of HAPs.

Review under EGLE MAPC Rule 278a, Scope of permit exemptions:

EGLE MAPC Rule 278a states that to be eligible for a specific exemption, any owner or operator must be able to provide information demonstrating the applicability of the exemption. The demonstration may include:

- a. *A description of the exempt process or process equipment, including the date of installation.* A description was provided in the demonstration. The installation date of the BACT-72A vapor degreaser has previously been identified to AQD as 11/20/2018.
- b. *The specific exemption being used by the process or process equipment.* The exemption demonstration identifies Rule 290 and various subrules under 290 as relevant to the BACT-72A vapor degreaser.
- c. *An analysis demonstrating that R 336.1278 does not apply to the process or process equipment.* This was demonstrated, as discussed above.

Additionally, the exemption demonstration is to be provided within 30 days of a written request from the department. BB&E provided this demonstration on 12/20/2019, within 3 days of my 12/17/2019 verbal request to them for an exemption demonstration.

Review under EGLE MAPC Rule 290, Permit exemptions; emission units with limited emissions:

EGLE MAPC Rule 290 exempts emission units with limited emissions from the requirement of EGLE MAPC Rule 201 to obtain a permit to install. It contains limits on emissions which have been determined to be protective of public health. It also contains requirements for monthly recordkeeping of calculated emissions. Mass balance can be used to estimate the emissions.

Subparts of Rule 290 relevant to this review were Rule 290(1), 290(2)(a)(i), 290(a)(ii)(A) through (E), and 290(2)(b) through(e). Please see discussion below.

Rule 290(1):

This subrule excludes emission units which are prohibited by Rule 278 and unless the requirements of Rule 278a have been met. Rules 278 and 278a have been previously discussed, above.

Rule 290(2)(a)(i):

EGLE MAPC Rule 290(2)(a)(i) allows an emission unit to be exempt if it emits only noncarcinogenic VOCs or noncarcinogenic materials that are listed in EGLE MAPC Rule 122(f) as not contributing appreciably to the formation of ozone, if the total uncontrolled or controlled emissions of air contaminants are not more than 1,000 or 500 lbs/month, respectively.

*Note: the term **emission control equipment** in Rule 290(2) is somewhat ambiguous. The DEQ EQP 3558 (Rev. 2/05) form, Rule 290 Permit to Install Exemption: Sources with Limited Emissions Record provides some clarification, on page 1. It states, in part, **If the emission unit is not equipped with a control device or the control device is vital to the production of the normal product of the process or to its normal operation, then the quantity of each emission of air contaminant identified in Sections 2, 3, 4, and 5 should be recorded as uncontrolled emissions.** It also describes a control device as **equipment that captures and/or destroys air contaminants.***

Since the BACT-72A vapor degreaser does not have an add-on control device, like a carbon adsorber, AQD would classify it as uncontrolled, in regard to Rule 290.

The BB&E exemption demonstration provides calculations of estimated emissions based upon an assumed usage of 0.5 gallons per hour of NEXT® 5408 in the BACT-72A vapor degreaser, over 3.5 hours of operating per day, 6 days/week 4 weeks per month. In the case of this demonstration, "operating" refers to the actual cleaning of parts. This calculation assumes that 0.5 gallons of solvent are lost to volatilization during each of the 3.5 operating hours per day, and that 100% of that is emitted.

Pentafluorobutane falls under Rule 290(2)(a)(i), because it is a noncarcinogenic VOC which is listed in EGLE MAPC Rule 122(f) as not contributing appreciably to the formation of ozone, and the total uncontrolled emissions of air contaminants are not more than 1,000 lbs/month. The estimated emissions of 333.57 lbs/month of Pentafluorobutane fall below the maximum allowed by this subrule, even when combined with emissions from the other compounds which make up NEXT® 5408.

Rule 290(2)(a)(ii)(A) through (E):

These subrules must be checked against estimated emissions of 1,2 trans-dichloroethylene (Trans-DCE) and 1,1,2,2-Tetrafluoroethyl 2,2,2-trifluoroethyl ether (Tetrafluoroethyl trifluoroethyl ether). Under Rule 290(2)(a)(ii), the CO₂ equivalent emissions are not allowed to be more than 6,250 tons per month. Because the vapor degreaser is not a fossil fuel-fired combustion source, CO₂ equivalent emissions are not expected to be more than 6,250 tons per month. Also under Rule 290(2)(a)(ii), the uncontrolled emissions of all non-CO₂-equivalent air contaminants are not allowed to be more than 1,000 lbs/month. The emissions of Trans-DCE and Tetrafluoroethyl trifluoroethyl ether controlled under this Subpart are estimated to be below 1,000 lbs/month. Additionally, Subrules (A) through (E) contain requirements, which are discussed below:

- (A) does not apply to this case. It states that for toxic air contaminants, excluding noncarcinogenic VOCs and noncarcinogenic materials listed in Rule 122(f) as contributing appreciably to the formation of ozone, with ITSLs greater than or equal to 0.04 ug/m³ and less than 2.0 ug/m³, uncontrolled emissions are not to exceed 20 lbs/month. However, Trans-DCE has an ITSL of 200 ug/m³, and so is not subject to the 20 lbs/month limit. The Tetrafluoroethyl trifluoro ethyl ether has no ITSL, but the surrogate ITSL of 4,000 ug/m³ determined by AQD's M. Depa qualifies and so is not subject to the 20 lbs/month limit.
- (B) does not apply to this case. It states that for toxic air contaminants with initial risk screening levels (IRSLs) greater than or equal to 0.04 micrograms per cubic meter, the uncontrolled emissions are not to exceed 20 lbs/month. However, neither Trans-DCE nor tetrafluoroethyl trifluoro ethyl ether have IRSLs, and so the 20 lbs/month limit does not apply.
- (C) states that the emission unit shall not emit any toxic air contaminants, excluding noncarcinogenic VOCs

and noncarcinogenic materials that are listed on EGLE MAPC Rule 122(f) as contributing appreciably to the formation of ozone, with an ITSL or IRSL less than 0.04 ug/m³. None of the compounds in NEXT® 5408 have either an ITSL or an IRSL less than 0.04 ug/m³.

- (D) limits total mercury emissions from an emission unit to no more than 0.01 lbs/month, whether controlled or uncontrolled. No mercury is known to be in NEXT® 5408, and no emissions of mercury are expected to be emitted. .
- (E) limits uncontrolled or controlled emissions of lead from an emission unit to no more than 16.7 lbs/month. No lead is known to be in NEXT® 5408, and no emissions of lead are expected to be emitted.

Rule 290(2)(a)(iii):

Rule 290(2)(a)(iii) is not applicable, because it regulates particulate air contaminants without IRSLs, in addition to air contaminants exempted under Rule 290(2)(a)(i) or (ii). The BACT-72A vapor degreaser using NEXT® 5408 solvent is not expected to be a source of particulate emissions.

Rule 290(2)(b):

Rule 290(2)(b) applies to emission units utilizing control equipment. In this exemption rule, control equipment would be add-on control equipment, such such as carbon adsorption, which the BACT-72A does not have. Therefore, this subrule is nonapplicable.

Rule 290(2)(c):

Rule 290(2)(c) requires a description of the emission unit to be maintained throughout the life of the unit. DCP was maintaining manufacturer documentation on the BACT-72A degreaser, as well as documentation on enhancements they have made to the unit, and a safety data sheet on the NEXT® 5408 solvent they proposed to use. They will have to continue to keep this information for the life of the degreaser.

Rule 290(2)(d):

Rule 290(2)(d) requires records of material use and calculations identifying the quality, nature, and quantity of the air contaminant emissions be maintained in sufficient detail to demonstrate that the emissions meet the emission limits contained in Rule 290. The estimated emissions in the exemption demonstration demonstrate that the emission limits are expected to be met. However, DCP will have to keep ongoing material use and emission records on a monthly basis, to demonstrate compliance based on the actual operations.

Rule 290(2)(e):

Rule 290(2)(e) requires the records to be maintained on file for the most recent 2-year period and made available to the department upon request. For using NEXT® 5408 solvent in the degreaser, DCP will have to keep the records of monthly solvent usage and emission estimates, and keep them on file for the most recent 2-year period. AQD will ask for the records during unannounced quarterly inspections of the degreaser, and routinely, on a monthly basis.

Estimated monthly actual emissions for each of the contaminants under Rule 290(2)(a)(ii) were as follows:

- Trans-DCE: 238.26 lbs/month
- Tetrafluoroethyl trifluoroethyl ether: 38.12 lbs/month

Combined emissions from the two contaminants above were calculated as 276.38 lbs/month. The Rule 290 exemption demonstration identifies them in the DEQ (now EGLE) *Rule 290 Permit to Install Exemption: Sources with limited Emissions Record*, Form EQP 3558, as having screening levels greater than 2.0 micrograms per meters cubed (ug/m³). This is consistent with Trans-DCE having a screening level of 200 ug/m³, and Tetrafluoroethyl trifluoroethyl ether having a surrogate screening level, per

AQD's M. Depa, of 4,000 ug/m3.

Total estimated monthly emissions from vapor degreaser, under EGLE MAPC Rule 290:

Estimated monthly actual emissions of each of the 3 ingredients:

- Trans-DCE: 238.26 lbs/month
- Tetrafluoroethyl trifluoroethyl ether: 38.12 lbs/month
- Pentafluorobutane: 333.57 lbs/month.

TOTAL estimated monthly emissions: 238.26 lbs/month + 38.12 lbs/month + 333.57 lbs/month = 609.95 lbs/month

The total estimated monthly emissions for the BACT-72A , at 609.95 lbs/month, are less than 1,000 lbs of noncarcinogenic VOCs or noncarcinogenic materials that are listed in R 336.1122(f) as not contributing appreciably to the formation of ozone. The proposed use of NEXT ® 5408 in the vapor degreaser therefore appears to satisfy the Rule 290 criteria, based upon my review. Under Rule 290, the actual solvent usage and calculated emissions will need to be recorded monthly by DCP.

Conclusion:

My review conducted this morning showed that the EGLE MAPC Rule 290 exemption demonstration appeared to satisfy the relevant criteria. On 1/6/2020, AQD Senior Permit Engineer Andrew Drury advised me that he had reviewed the demonstration, and that he also felt that it satisfied the exemption criteria. A summary of the subsequent toxics review by AQD's Toxics Unit is attached to a 1/31/2020 email from AQD Toxicologist Mike Depa to myself; please refer to district file.

AQD will conduct unannounced, quarterly inspections of the BACT-72A vapor degreaser, and will request recordkeeping on a monthly basis, to verify compliance with EGLE MAPC Rule 290. AQD will also check compliance with EGLE MAPC Rule 708, which now applies to the unit, because it no longer uses TCE.

NAME 

DATE 2/28/2020 SUPERVISOR 

