



west virginia department of environmental protection

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Evaluation Memo

Application Number: PD17-018
Facility ID Number: 061-00061
Name of Applicant: Addivant USA, LLC
Name of Facility: Morgantown North Plant
Location of Facility: Morgantown, Monongalia County
Latitude/Longitude: 39.609949/-79.975551°
Application Type: Permit Determination
Submission Date: March 9, 2017
Complete Date: March 9, 2017
Due Date: **April 8, 2017**
Engineer: Mike Egnor

Background Information

On March 9, 2017 Addivant USA, LLC submitted a Permit Determination Form (PDF) for proposed changes at their Morgantown North Plant located at the Morgantown Industrial Park, Morgantown, WV. According to Addivant, the facility was constructed in the 1960's and the majority of the facility is considered grandfathered under 45CSR13. The facility was the subject of some permits in the 2000's (with the last permit issued on August 22, 2003). One previous permit determination has been submitted for the facility in 2010. There is no Title V permit for the facility.

Statutory Authority of the DAQ

The statutory authority of the of the DAQ is given under the Air Pollution Control Act (APCA) - West Virginia Code §22-5-1, et. seq. Based on the language under §22-5-1, et. seq., the DAQ, in making “stationary source” determinations under 45CSR13, does not take into consideration non-air quality issues such as nuisance potential (noise, sight line obstruction, traffic)

or non-air quality environmental impacts.

Description of Process

Description of Proposed Plant Trial of W430ZP (Zero Phenol)

Currently, W430 is produced in the plant by reacting Triphenyl Phosphite (TPP) with Di Propylene Glycol (DPG) in the presence of catalyst (sodium methylate). Phenol and excess DPG are removed from the product, and the product is then cooled down, filtered, and transferred into plastic totes or drums. This operation is all performed at the 183 Production area, using the K-3 reactor and K-23 filtration vessel systems.

The regular W430 product contains residual phenol, and the customer for this product has now requested a phenol-free version of this product. The W430ZP grade uses Trimethyl Phosphite (TMP) instead of the TPP to react with the DPG. Methanol is generated instead of phenol, and excess DPG is still removed from the product at the end of the reaction. The product would then still need to be cooled down, filtered and transferred into plastic totes or drums.

A 3-batch plant trial is proposed to demonstrate the scale-up of the W430ZP process. The reaction would be done in the K-20 reactor, located in the K-9 Production Building. DPG would be metered into K-20, and drums of TMP would be vacuum transferred into the reactor. Catalyst would be added last. Methanol would be distilled through an existing, distillation column and condenser and would collect in a receiver. Chilled water would be used on the condenser and receiver jacket to collect the methanol. An existing water/steam jet utility would be used in the distillation process. The effluent from the water/steam jets will be collected into temporary portable holding tanks. Once the methanol is removed from the batch by a combination of atmospheric and vacuum distillation, the methanol from the receiver will be pumped into waste drums. Excess DPG would then be vacuum distilled into the same receiver to complete the distillation process for the batch. The collected DPG in the receiver will be re-used in the next batch of W430ZP produced. The resulting W430ZP product in K-20 would then be cooled down using an external product cooler and transferred to the K-4 filtration vessel, located at the 183 Production Building. The W430ZP will then be filtered in K-4, then transferred into plastic totes or drums after passing QC approval testing.

The modifications that will be performed for the plant trial include the following:

1. Piping tie-ins will be made to an existing 1-1/2" stainless steel transfer line that runs from the 183 Production Building to the K-9 Production Building to enable DPG to be transferred from the T-9 storage tank to the K-20 reactor; and also be able to get W430ZP product back through the line and into K-4 filter treatment vessel.
2. A Metering manifold will be fabricated and installed at the K-9 Building to allow metering of DPG from the storage tank and receiver into K-20 and also to allow metering of the W430ZP from K-20 to K-4.
3. Piping modifications will be done on the existing tempered water circulating system to keep the tempered water on K-20's primary condenser and keep the chilled water on K-20's secondary

condenser.

4. A new level transmitter will be installed on K-20's receiver (R-44). Also, an amp meter will be installed on K-20's agitator motor.

5. A small exhaust blower and activated carbon drums will be installed at the methanol drumming area to reduce odor generation.

6. Piping modifications will be made at K-4's pump manifold to enable the W430 ZP product to be isolated from other product made in the adjacent K-3 reactor that also uses this manifold.

The plant used to make a similar product to W430ZP in the past called TIOP (Tri-iso octyl phosphite) where octyl alcohol and TMP were reacted in a similar fashion. It was made in the K-20 reactor using the water/steam jet system. Any vapors from the DPG & TMP charging operation and the methanol distillation operation will be scrubbed by the water/steam jet utility. Vapors from the methanol drumming operations will be exhausted through an activated carbon drum unit. Upon a successful trial, a new vacuum system and other equipment would be installed for an improved, plant production process.

Air Emissions and Calculation Methodologies

Addivant submitted extensive, complex, and detailed emissions calculations of the emissions increase associated with the proposed change discussed above. They based the calculations on the following basic parameters: W430ZP Trial Process occurs 3 times a year with a 1,500 gallon/trial batch size. The batch time was assumed to be 1 hour per batch. The efficiency of the control equipment was zeroed out to determine the Potential to Emit (PTE) for the process. The emissions increase was additionally based on only the additional and new raw materials used in the production of W430ZP over the use of the materials used in the grandfathered production of W430. This is acceptable as the production occurs in the existing grandfathered reactor.

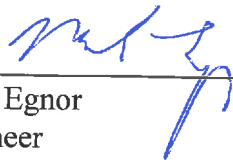
Based on the submitted calculations, the maximum emissions increase with the proposed changes are estimated to be a maximum of 3.26 lb-VOC/hr (1.04 lbs-HAPs/hr) and 0.10 tons-VOCs/year (0.02 tons-HAPs/year). The complete and detailed calculations are available in the file.

Determination of Permit Applicability

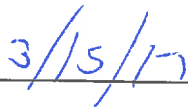
Pursuant to §45-13-5.1, “[n]o person shall cause, suffer, allow or permit the . . . modification . . . and operation of any stationary source to be commenced without . . . obtaining a permit to . . . modify.” The definition of “modify” is given under Section 2.17 of 45CSR13 and primarily defines various emission levels that would define any proposed changes as a modification and require Addivant to get a permit prior to construction. Based on the emission estimate submitted by Addivant as discussed above, the proposed changes do not exceed any of the modification thresholds under §45-13-2.17.

Summary and Recommendation

Based on the information provided by Addivant, I recommend the issuance of a “no permit needed” letter to Addivant USA, LLC for the proposed changes at their Morgantown North Plant.



Mike Egnor
Engineer



Date