



Mike DeWine, Governor  
Jon Husted, Lt. Governor  
Laurie A. Stevenson, Director

June 15, 2021

Jane Neal  
AMG Vanadium LLC  
60790 Southgate Road  
Cambridge, Ohio 43725

**Re: AMG Vanadium LLC  
Non-permit Related Variance  
Correspondence  
RCRA C - Hazardous Waste  
Guernsey County  
OHD 042 319 244**

**Subject: Variance From Classification as a Waste Modification**

Dear Ms. Neal,

On June 11, 2021, the Director of Ohio EPA approved a Variance from classification as a waste (Variance) modification to AMG Vanadium LLC (AMG) for the facility located at 60790 Southgate Road, Cambridge, Ohio 43725 in Guernsey County. This modified Variance allows AMG to make the following changes:

- Ability to transfer Reclaimed Catalyst or Roasted Catalyst to AMG's Zanesville Facility located in Zanesville, Ohio.
- Refine language regarding the use of bill of lading.
- Add an exemption from the definition of solid waste K171 and K172 when in transit between AMG owned/operated facilities but not with any other transit scenarios within the State of Ohio.
- Update language to formally recognize operations such that AMG does not intend to store Reclaimed Catalyst or waste that contains Free Liquid within the wet storage area of RMSB #1.
- Update the Variance application to reflect the authorized storage capacity in RMSBs is based on the financial assurance and may be less than the total design storage capacity.

To issue this modified Variance, Ohio EPA determined that the Variance modification application is complete and meets appropriate standards. Enclosed is the final Variance issued by the Director. Please note that the Variance remains in effect until it is renewed, withdrawn, suspended or revoked.

You are hereby notified that this action of the Director of Ohio EPA (Director) is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of \$70.00 made payable to "Treasurer, State of Ohio." The Commission, in its discretion, may reduce the fee if by affidavit it is demonstrated that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission  
30 East Broad St., 4th Floor  
Columbus, Ohio 43215

The record related to this action can be retrieved from the Agency's eDocument Search web site: <http://edocpub.epa.ohio.gov/publicportal/edochome.aspx>. Click **Show Advanced** and then search under the document type of **Non-permit Related Variance**. Refine the search using the facility's RCRA ID number (Secondary ID) which is noted in the RE: block above.

If you have any questions concerning this Variance, please contact Chloé Mercier of Ohio EPA's Central Office, Division of Environmental Response and Revitalization, at (614) 644-2924.

Sincerely,



Chloé Mercier, Environmental Specialist III  
Division of Environmental Response and Revitalization

Enclosures

cc: Brad Mitchell, DERR, CO  
Emily Deshaies, DERR, SEDO  
Kristy Hunt, DERR, SEDO  
Scott Bergreen, DERR, SEDO

6/11/2021

**BEFORE THE  
OHIO ENVIRONMENTAL PROTECTION AGENCY**

**IN THE MATTER OF:**

**AMG Vanadium LLC**  
60790 Southgate Road  
Cambridge, Ohio 43725

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**Variance from Classification as a  
Waste**

Applicant

**PREAMBLE**

It is agreed by the parties hereto as follows:

**I. JURISDICTION**

This Variance from Classification as a Waste (Variance) is issued to AMG Vanadium LLC (Applicant) located at 60790 Southgate Road in Cambridge, Ohio 43725 pursuant to the authority vested in the Director of the Ohio Environmental Protection Agency (Ohio EPA) under Ohio Revised Code (ORC) §§ 3734.02, 3734.14, 3745.01 and Ohio Administrative Code (OAC) rule 3745-50-23.

**II. PARTIES BOUND**

This Variance shall apply only to the Applicant. No change in ownership of the Applicant or of the Facility shall in any way alter the Applicant's obligations under this Variance.

**III. DEFINITIONS**

1. Unless otherwise stated, all terms used in this Variance shall have the same meaning as defined in ORC Chapter 3734 and the rules promulgated thereunder. Whenever the terms listed below are used in this Variance, the following definitions shall apply:



- a. "Accepted at Facility" shall mean that time when Reclaimed Catalyst is within the Facility security fence.
- b. "Applicant" shall mean AMG Vanadium LLC located at 60790 Southgate Road in Cambridge, Ohio 43725.
- c. "Application" shall mean the responses to the criteria listed in OAC rule 3745-50-24 (C) and supporting documents for a Variance submitted by Applicant on August 4, 2017, the May 25, 2018 Revision 0.1, the September 12, 2018 Revision 0.2, and the January 25, 2019 Revision 0.3. The Application is attached hereto and incorporated herein this Variance.
- d. "Baghouse Dust" is a Process Residual that is generated from the electric arc furnaces and collected in the baghouses.
- e. "Emergency Spill" is defined as any on-site release of Reclaimed Catalyst that could result in or pose an imminent danger which requires prompt action to mitigate or minimize the impact of the incident on human health or the environment; or any release that Applicant is required to report to Ohio EPA's Spill Hotline or the National Response Center.
- f. "Facility" or "Cambridge Facility" or "Company" shall mean the metals reclamation site at 60790 Southgate Road, Cambridge, Ohio 43725 and all contiguous land, and structures used for storing and processing Reclaimed Catalyst or Roasted Catalyst.
- g. "Free Liquid" means liquids which readily separate from the solid portion of a material under ambient temperature and pressure. Free Oil that runs off from Reclaimed Catalyst is considered Free Liquid.
- h. "Free Oil" means the residual oil that coats the Reclaimed Catalyst until the Reclaimed Catalyst is processed through the Roaster.
- i. "Incidental Spill" is a release of Reclaimed Catalyst that may occur during routine handling within the Facility boundaries and which does not pose an imminent danger to human health and the environment.
- j. "K171/K172" means spent hydrotreating or hydrorefining catalyst from petroleum refining operations that is classified as a hazardous waste under Ohio EPA's hazardous waste rules.
- k. "LimeAdd™" is the material generated when lime is allowed to react with sulfur dioxide in the flue gas desulfurization unit. It consists of calcium sulfite, calcium sulfate, unreacted lime and flyash.

- l. "Products" shall include but not be limited to Roasted Catalyst, calcium aluminate additive (Revan™), slabs containing iron, nickel and molybdenum (FeNiMoly®) and ferrovanadium alloy (FeroVan®).
- m. "Process Residuals" are not listed hazardous waste K171 or K172 and means those secondary materials generated from the processing and management of Reclaimed Catalyst and Roasted Catalyst including but not limited to LimeAdd™, #1 Baghouse Dust, #2 Baghouse Dust, Free Liquid, Slag, water removed from the roaster feed building, water that has come in contact with Reclaimed Catalyst or Process Residuals, and vehicle wash water.
- n. "Railcar Unloading Area" consists of the following units: railcar screw conveyor system, railcar canopy and gangway, containment and conveyor area pad, track pan system, truck loading pad, and roll-off box or truck.
- o. "Raw Material Storage Building" (RMSB) is a containment building as defined in OAC rule 3745-50-10 at the Facility where Reclaimed Catalyst and Roasted Catalyst are stored and/or blended prior to processing in the Roasters or electric arc furnaces.
- p. "Reclaimed Catalyst" means K171/K172 containing vanadium, nickel, and/or molybdenum that has been Accepted at the Facility and has been reclaimed to recover crude oil prior to the catalyst being shipped to the Applicant for further metals recovery.
- q. "Roasted Catalyst" means the Reclaimed Catalyst that has been processed through a Roaster and is further processed as a raw material to reclaim its metal values.
- r. "Roaster" for the purposes of inspections means the roaster feed building, roaster feed hoppers, conveyor system, roaster, baghouse and LimeAdd™ silo.
- s. "Slag" is a Process Residual that is generated in the electric arc furnaces, along with Products.
- t. "Zanesville Facility" means that metals reclamation site at 2295 Innovation Way in Zanesville, Ohio and all contiguous land and structures used for storing and processing Reclaimed Catalyst or Roasted Catalyst.

#### **IV. FINDINGS**

1. Applicant is a Limited Liability Company doing business in the State of Ohio. Applicant is a "person" as defined in ORC § 3734.01(G) and OAC rule 3745-50-10(A).

- iii. Reclaimed Catalyst is delivered to the Applicant primarily in bulk railcars. This material is then, as demand requires, transported to storage areas in RMSB #2 or #3 by heavy equipment, or transported directly to the roaster feed hoppers without prior storage in a RMSB. The Reclaimed Catalyst may also be loaded into a truck or railcar for transport to the Zanesville Facility for further reclamation. Once in the roaster feed hoppers, the Reclaimed Catalyst is transferred to one of the two Roaster buildings by enclosed conveyor, where it is roasted. The roasting process is primarily to convert the metal sulfides in the Reclaimed Catalyst to metal oxides and to reduce the amount of carbon in the material. The Roasted Catalyst exits the bottom of the Roaster where it may be screened to remove oversize material. The Roasted Catalyst may be transported and stored prior to being sold as a Product. Alternatively, Roasted Catalyst can be blended with other raw materials for processing in the electric arc furnaces (EAFs). The blended material is transferred to the furnace room and then fed through the furnace feed hoppers to the EAFs for the melting process. The EAFs generate ferrovanadium alloy, Ferrovan®, as the major product as well as two co-products; Revan™, which is sold as a metallurgical slag for steelmaking, and FeNiMoly®, which is sold based on its metal content. Intermediate product Slag is also generated, which is re-processed through the EAFs into one of these three products or can be sold.

**b. The value of the material after it has been reclaimed.**

- i. The Reclaimed Catalyst is of significant economic value due to its vanadium, nickel and molybdenum content. The Applicant enters into long term contractual purchase agreements with suppliers to ensure its supply of this raw material feedstock. Applicant purchases the Reclaimed Catalyst based upon the market price of the vanadium, nickel and molybdenum contained in the catalyst.
- ii. The Applicant further processes the catalyst to produce four products. Three products are used in the iron and steelmaking industry. Ferrovan® is an iron and vanadium alloy that is used to make steel stronger which can result in lighter structural steel components. FeNiMoly® alloy is used to make stainless steel and Revan™ is used as a fluxing agent in the steelmaking industry. The Roasted Catalyst is utilized as a raw material for its metal value and can be processed, or sold, for the purpose of metals reclamation.
- iii. The significant economic value of the Roasted Catalyst, Ferrovan®, FeNiMoly® and Revan™ will be determined by market conditions and in the case of the ferroalloys, the content of vanadium, nickel and molybdenum contained within them. The value of these metals has risen with increased global demand and a shortage of vanadium bearing raw

## **V. GENERAL CONDITIONS**

1. All activities undertaken by Applicant pursuant to this Variance shall be performed in accordance with the requirements of all applicable federal, state and local laws, regulations and ordinances.
2. Reclaimed Catalyst that is recycled by reclamation according to 3745-51-01 (C)(4) for its metal content is not defined as a waste or a hazardous waste. Therefore, the Reclaimed Catalyst is not subject to the management, treatment and closure requirements for hazardous wastes received from off-site imposed by the Applicant's hazardous waste installation and operation permit. Applicant is subject to the conditions imposed by the Applicant's hazardous waste permit that are applicable to the Facility including but not limited to financial assurance, corrective action, and facility changes that trigger permit modification obligations.
3. Applicant shall construct, operate, and maintain all the equipment and storage units associated with the reclamation process so as to minimize loss or release to the environment of Reclaimed Catalyst, as generally described in the Application. Nothing in the preceding sentence, however, shall prohibit Applicant from constructing, operating, maintaining, repairing, improving, enhancing, or changing equipment or the structures of the physical plant associated with the reclamation process so long as Applicant's equipment, structures and reclamation process remain generally consistent and functionally equivalent to those described in the Application. In addition, the Applicant shall comply with the following specific conditions:
  - a. **Manifest and Bill of Lading System:** Applicant shall, when accepting shipments of K171/K172 at the Facility except as provided for in iii.:
    - i. Sign the manifest and comply with OAC rule 3745-65-71, Use of manifest system, regarding the manifest. Manifest shall be retained on-site at the Facility for three years.
    - ii. Comply with OAC rule 3745-65-76, Unmanifested waste report, when hazardous waste K171/K172 is received at the Facility not accompanied by a hazardous waste manifest.
    - iii. Shipments of K171/K172 that originate from AMG owned/operated facilities within the State of Ohio will utilize a Bill of Lading as the K171/K172 remains a Reclaimed Catalyst once it has entered the fence line of AMG owned/operated facilities.
  - b. **Storage:** Applicant shall store Reclaimed Catalyst that does not contain Free Liquid as defined by the paint filter test, Method 9095B, SW-846, either in piles, tanks, railcars and/or containers at the Facility.

- i. Containers, railcars and tanks shall be nonleaking and compatible with the Reclaimed Catalyst. Containers shall be kept closed when catalyst is not being added or removed.
  - ii. Piles shall only be used for storage provided the piles are located in a Raw Material Storage Building and the floor of that RMSB is compatible with the catalyst.
- c. **Storage:** Applicant shall store Reclaimed Catalyst that contains Free Liquid as defined by the paint filter test, Method 9095B, SW-846, in tanks, containers, railcars or piles at the Facility.
  - i. Containers, railcars, and tanks shall be nonleaking, compatible with the Reclaimed Catalyst. Containers shall be kept closed when catalyst is not being added or removed.
  - ii. Piles shall only be used for storage provided the piles are located in a wet storage area of a RMSB that is compatible with the Reclaimed Catalyst, and has a dual containment system to prevent migration of oily residue Free Oil into the soil or ground water
- d. **Raw Material Storage Building:** With respect to the storage of Reclaimed Catalyst and Process Residuals, Applicant shall operate and inspect each of the RMSBs in accordance with the OAC rules 3745-205-100 to 3745-205-101.
- e. **RMSB Sump and Leak Detection Port Inspections:** Once per calendar day when Reclaimed Catalyst is managed in RMSB #2 or #3, the Applicant shall inspect each of the RMSB sumps and each of the upper and lower leak detection ports for the presence of liquid.
  - i. Applicant shall remove from the sumps and detection ports of RMSB #2 all liquid that can be removed using practices commonly employed (e.g. pumping) and separately quantify and document the total volume of liquid removed from each of the following:
    - 1. Upper leak detection ports.
    - 2. Lower leak detection ports.
    - 3. Sumps.

Applicant may request, and Ohio EPA may allow, change in, or elimination of, the requirement to document volumes of liquid collected.
  - ii. Applicant shall remove from the sumps and detection ports of RMSB #3 all liquid that can be removed using practices commonly employed (e.g. pumping), and separately quantify and document the total volume of liquid removed from each of the following:



- q. **Notification:** Applicant shall provide written notification to Ohio EPA for the following:
- i. According to Section XIII of this variance whenever Applicant receives Reclaimed Catalyst from a new supplier. The notification shall include the original supplier's name, country of origin, estimated amount of Reclaimed Catalyst to be received on a yearly basis, a copy of the supplier's completed acceptance form, a description of how the Reclaimed Catalyst was partially reclaimed prior to being shipped to the Applicant and verification that the metals content meets or exceeds 2% by dry weight.
  - ii. In the event Reclaimed Catalyst will be transported to the Zanesville Facility for further reclamation, the Applicant shall notify Ohio EPA prior to the scheduled shipment(s). At a minimum, the notification shall include the estimated quantity of Reclaimed Catalyst, an estimated date(s) of the shipment(s), and an explanation why the shipment(s) is necessary.
- r. **Rejected Reclaimed Catalyst:** Reclaimed Catalyst that cannot be reclaimed by the Applicant for any reason shall be returned as soon as possible to the supplier, or transported to a permitted hazardous waste storage, treatment, or disposal facility, or sent for legitimate recycling. The rejected Reclaimed Catalyst must be managed as hazardous waste K171 or K172 in accordance with all applicable Ohio EPA hazardous waste laws. The Applicant may assume generator duties for the purpose of completing the manifest.

## **VI. ACCESS TO INFORMATION**

Applicant shall provide Ohio EPA, upon request and within thirty (30) days unless an alternate time frame is agreed upon, in writing, by the Applicant and Ohio EPA, copies of all information relating to this Variance within its respective possession or control, or within the possession or control of its respective contractors or agents, including but not limited to documents and information related to the issuance, use and implementation of this Variance.

Applicant may assert a claim that documents and other information submitted to Ohio EPA pursuant to this Variance are confidential under the provisions of OAC rule 3745-50-30. If no such claim of confidentiality accompanies the documents and other information when submitted to Ohio EPA, the documents and other information may be made available to the public without notice to Applicant.

## **VII. ACCESS TO SITES**

Applicant shall provide Ohio EPA with access, at all reasonable times, including during normal business hours, to the Facility. Access under this Variance shall be for the purpose of conducting any activity related to this Variance or Ohio EPA's regulatory responsibilities, including but not limited to, the following:

**IT IS SO ORDERED AND AGREED:**

**Ohio Environmental Protection Agency**



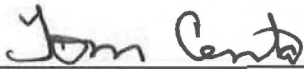
Laurie A. Stevenson  
Director

6/11/2021

Date

**IT IS SO AGREED:**

**AMG Vanadium LLC**



Signature

4/19/2021

Date



Printed or Typed Name



Title