

By:  Date: _____

6/11/2021

**BEFORE THE
OHIO ENVIRONMENTAL PROTECTION AGENCY**

IN THE MATTER OF:

AMG Vanadium LLC
2295 Innovation Way
Zanesville, Ohio 43701

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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 2295 Innovation Way in Zanesville, Ohio 43701 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 2295 Innovation Way in Zanesville, Ohio 43701.
- 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 November 1, 2019, and as revised on January 9, 2020 Revision 0.1. The Application is attached hereto and incorporated herein this Variance.
- d. “Baghouse Dust or Cyclone Dust” is a Process Residual that is generated from the electric arc furnaces (EAFs) and collected in the baghouse or cyclone.
- e. “Cambridge Facility” shall mean the metal reclamation site at 60790 Southgate Road in Cambridge, Ohio 43725 and all contiguous, land, and structures used for storing and processing Reclaimed Catalyst or Roasted Catalyst.
- f. “Circulating Dry Scrubber” or “CDS” is a Flue Gas Desulfurization (FGD) unit that utilizes dry lime to react with acid gases, specifically sulfur dioxide (SO₂) in the combined offgas from the Roaster and primary EAF. The product of the reaction of the hydrated lime and acid gases is LimeAdd™.
- g. “EAF Feed Building” is a building at the Facility where Roasted Catalyst is stored or blended prior to processing in the EAFs.
- h. “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.
- i. “Facility” or “Zanesville Facility” or “Company” shall mean the 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.
- j. “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.
- k. “Free Oil” means the residual oil that coats the Reclaimed Catalyst until the Reclaimed Catalyst is processed through the Roaster

- l. “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.
- m. “K171/K172” means spent hydrotreating or hydrotreating catalyst from petroleum refining operations that is classified as a hazardous waste under Ohio EPA's hazardous waste rules.
- n. “LimeAdd™” is a Process Residual that is generated in the Circulating Dry Scrubber baghouse 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.
- o. “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®).
- p. “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™, EAF Cyclone Dust, EAF Baghouse Dust, Free Liquid, Slag, water that has come in contact with Reclaimed Catalyst or Process Residuals, and vehicle wash water.
- q. “Railcar Unloading Area” consists of the following units: railcar conveyor system, railcar canopy and gangway, containment and conveyor area pad, truck pan system, truck loading pad, roll-off box or truck, double-walled above ground storage tank for Free Liquid, and optional storm water oil/water separator.
- r. “Raw Material Storage Building” or “RMSB” is a containment building as defined in OAC rule 3745-50-10 at the Facility where Reclaimed Catalyst is stored and/or blended prior to processing in the Roaster and EAFs.
- s. “Reclaimed Catalyst” means K171/K172 containing vanadium, nickel, and/or molybdenum that has been Accepted at the Facility and has been reclaimed (e.g., to recover crude oil) prior to the catalyst being shipped to the Applicant for further metals recovery.
- t. “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.
- u. “Roaster” for the purposes of inspections means the roaster feed hoppers, conveyor system, roaster, Circulating Dry Scrubber and baghouse, and LimeAdd™ silo.

- v. “Slag” is a Process Residual that is generated in the EAFs, along with Products.

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).
2. Applicant operates and maintains a metals reclamation facility located at 3400 East Pointe Drive, Zanesville, Ohio 43701. The materials of value to the Applicant are vanadium, nickel, and molybdenum.
3. Applicant receives metal bearing materials from suppliers predominately in the petroleum refining and power industries. The materials received from these industries include vanadium-bearing spent hydrotreating and hydrorefining catalysts and nonhazardous bottom ash from coal burning power plants. The industrial process used by Applicant to reclaim vanadium-bearing materials is a pyrometallurgical process that uses a Roaster and EAFs.
4. Applicant receives Reclaimed Catalyst from the petroleum refining industry. The Reclaimed Catalyst is of value to the Applicant due to its vanadium, nickel and molybdenum content. The vanadium concentration of vanadium containing Reclaimed Catalyst is higher than naturally occurring vanadium ore. Naturally occurring vanadium ore deposits that are economically feasible for mining generally contain approximately 0.5 percent vanadium. The vanadium content of the Reclaimed Catalyst will vary but will typically be greater than 1.5 percent vanadium and often between 7 and 10 percent.
5. Applicant further reclaims the Reclaimed Catalyst to yield four Products: Roasted Catalyst, Ferrovan®, Revan™, and FeNiMoly®.
6. The Application addresses the standards and criteria set forth in OAC rule 3745-50-24 (C) for issuing a variance from classification as a waste in the following manner:
 - a. **The degree of processing the material has undergone and the degree of further processing that is required:**
 - i. The metals of interest to Applicant are vanadium, nickel and molybdenum. Some or all of these occur in crude oils and oil sands at parts per million levels, with the exact concentration dependent on the oil source.
 - ii. The metals are partially reclaimed from the oil during the upgrading or refining process so that they are present at the percent level in the

catalyst. The catalyst is then substantially partially reclaimed outside of the refining process to reclaim crude oil product producing Reclaimed Catalyst. The Reclaimed Catalyst is shipped to the Applicant's Facility for further reclamation. Once at Applicant's Facility, the Reclaimed Catalyst is reclaimed further in Applicant's proprietary process as the raw material to produce the Products Roasted Catalyst, Ferrovan®, FeNiMoly®, and Revan™.

- iii. Reclaimed Catalyst is delivered to the Applicant primarily in bulk railcars or trucks. This material is then, as demand requires, transported to storage areas in a RMSB 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 Cambridge Facility for further reclamation. Once in the roaster feed hoppers, the Reclaimed Catalyst is transferred to the Roaster 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 by enclosed conveyor to the silo system that blends feed for the EAFs, discharged to an enclosed truck for transport to the Cambridge facility for further reclamation, discharged to an enclosed truck for transport to the EAF Feed Building for later loading into feed hoppers, transported and stored prior to being sold as a Product. Alternatively, Roasted Catalyst can be blended with other raw materials for processing in the 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 a ferro 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. 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 materials. Applicant is the last domestic source of ferro vanadium available to the American steel industry.

c. The degree to which the Reclaimed Catalyst is like an analogous raw material:

- i. The Reclaimed Catalyst is valuable to the Applicant for its vanadium, nickel, and/or molybdenum content with vanadium being of primary interest to the Applicant. The Reclaimed Catalyst is a commodity-like material and a valuable substitute for vanadium containing ore. Vanadium containing ore deposits contain less than 1 percent vanadium pentoxide (approximately 0.5 percent vanadium) and are often much lower. The vanadium content of the Reclaimed Catalyst will vary but will typically be greater than 1.5 percent vanadium and often between 7 and 10 percent.
- ii. There are no domestic sources of vanadium bearing ore, although uranium ore bodies located in Utah and Colorado do contain vanadium at approximately 0.75 percent. The most extensive sources are located in South Africa, Russia, Brazil, and China.

d. The extent to which an end market for the Reclaimed Catalyst is guaranteed:

- i. The end market for the Reclaimed Catalyst is guaranteed as Applicant requires the Reclaimed Catalyst to produce its valuable Products. Applicant enters into long term contractual purchase agreements with petroleum refineries to ensure a continuous supply of Reclaimed Catalyst.
- ii. Applicant's Products have a guaranteed saleable market as demonstrated by its sales history, known customers, and expanding demand for Applicant's final Products Roasted Catalyst, Ferrovan®, FeNiMoly® and Revan™.

- iii. Applicant's Products are sold for use in the metals industry including, but not limited to, the steelmaking industry. Ferrovan® is an iron and vanadium alloy that is used to make steel stronger allowing for production of lighter structural components. FeNiMoly® is an alloy used to make stainless steel. Revan™ is used as a fluxing agent in the steelmaking industry. Roasted Catalyst is a metal bearing feedstock that is reclaimed for its metals value.

e. The extent to which the reclaimed material is handled to minimize loss:

- i. The Application includes narrative information and attachments regarding the management and processing of Reclaimed Catalyst and other materials. To ensure the proper handling of Reclaimed Catalyst and other materials, the Applicant maintains and implements the following: Contingency Plan, Inspection Program, Training Program, site security, and safety plan. Proper handling of Reclaimed Catalyst and other materials is also ensured through the Applicant's procedures related to the use and management of containers and operation of a RMSB.
- ii. Site security is achieved through procedures that include fencing, gates, signage, access keycards, and a security guard that is present twenty-four (24) hours per day.
- iii. The Training Program ensures that all personnel involved with the handling of Reclaimed Catalyst and other materials receive initial and periodic classroom instruction and on-the-job training to ensure duties are performed correctly. The Training Program also includes various health and safety aspects.
- iv. The Inspection Program consists of a procedural system for the inspection of communications and alarm systems, fire protection equipment, spill control equipment, and decontamination equipment. The Inspection Program is also meant to determine the malfunction or deterioration of equipment and structures, operator errors, and discharges of Reclaimed Catalyst and other materials that could pose a threat to human health and the environment.
- v. The Contingency Plan is designed to minimize hazards to human health and the environment from emergencies which include fires, explosions, severe weather, floods, power outages, or releases of Reclaimed Catalyst, and other materials.

7. Based upon the information submitted by the Applicant in the Application, the Director finds that the Reclaimed Catalyst is not a waste as defined in OAC rule

3745-51-02 when Accepted at the Facility for further reclamation, and managed according to the conditions of this Variance.

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.
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 Reclaimed Catalyst is not being added or removed.
 - ii. Piles shall only be used for storage provided the piles are located in a RMSB and the floor of that RMSB is compatible with the Reclaimed Catalyst.

- c. **Storage:** Applicant shall store Reclaimed Catalyst that contains Free Liquid as defined by the paint filter test, Method 9095B, SW-846, in piles, tanks, railcars and/or containers at the Facility.
 - i. Containers, railcars, and tanks shall be nonleaking, compatible with the Reclaimed Catalyst. Containers shall be kept closed when Reclaimed 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 RMSB in accordance with the OAC rules 3745-256-100 to 3745-256-101.
- e. **RMSB Sump and Leak Detection Port Inspections:** Once per calendar day when Reclaimed Catalyst is managed in a RMSB, 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 a RMSB 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 maintain documentation of the volume of liquid removed from the sumps and the leak detection ports required by Section V.3.e.i. of this Variance for three years.
 - iii. Applicant shall submit a report to Ohio EPA according to Section XIII of this Variance by June thirtieth (30th) each calendar year containing the following information associated with the activities in Sections V.3.e.i and V.3.e.ii:
 - 1. The total volume of liquid removed from each sump every calendar month until otherwise notified by Ohio EPA.
 - 2. The total volume of liquid removed from each upper leak detection port every calendar month until otherwise notified by Ohio EPA.

3. The total volume of liquid removed from each lower leak detection port every calendar month until otherwise notified by Ohio EPA.
- f. **Process Residuals:** Process Residuals are not listed hazardous waste K171 or K172. Applicant shall determine whether Process Residuals destined for disposal meet the definition of a characteristic hazardous waste or are defined as a listed hazardous waste other than K171 or K172, pursuant to OAC rule 3745-52-11. Process Residuals meeting the definition of a hazardous waste shall be managed according to ORC Chapter 3734 and the hazardous waste management rules promulgated thereunder.
- g. **Financial Assurance:** Applicant shall maintain financial assurance in accordance with the following:
 - i. **Cost Estimate:** Applicant must submit a detailed written estimate, according to Attachment A of this Variance of the cost of disposing Reclaimed Catalyst, and decontaminating the units and areas used to store Reclaimed Catalyst.
 - ii. **Financial Assurance Mechanism:** Applicant shall maintain financial assurance in compliance with OAC rule 3745-55-43 and provide to Ohio EPA documentation of financial assurance which meets the wording requirements of OAC rule 3745-55-51, in at least the amount of the estimate, as required by Section V.3.g.i of this Variance.

Note: For the purposes of complying with the financial assurance and cost estimate conditions of this Variance, the following terms shall be read in OAC rules 3745-55-43 and 3745-55-51 as defined below:

1. "Closure" shall mean "removal and decontamination."
 2. "Hazardous waste" shall mean "Reclaimed Catalyst"
 3. Owner/operator" shall mean "Applicant."
 4. "Facility" shall mean "Facility" as defined in this Variance.
- iii. **Storage Capacity:** Applicant shall store at the Facility no more than the volumes of Reclaimed Catalyst designated in the cost estimate required by Section V.3.g.i. of this Variance. The maximum volume of Reclaimed Catalyst that can be stored at any one time in a RMSB is:
 1. RMSB #4: 6,600 cubic yards of Reclaimed Catalyst.
 - iv. **Additional Storage Capacity:** If Applicant plans to increase the storage capacity of the amount of Reclaimed Catalyst stored at the Facility, Applicant shall submit a detailed written estimate in accordance with Attachment A of this Variance. The financial assurance mechanism as required by Section V.3.g.ii. of this Variance

shall be increased to an amount at least equal to the increased cost estimate prior to use of the increased storage capacity.

h. **Contingency Plan:** Applicant shall maintain, revise as necessary, and implement the Facility contingency plan which includes but is not limited to, emergency notification and evacuation procedures, listing of emergency equipment, identification of hazardous materials, control procedures, post-emergency procedures and specific emergency procedures for areas of the Facility, pursuant OAC rule 3745-54-50 through 3745-54-56 and as provided in Attachment 8 of the Application. The specified areas generally consist of the RMSB, mill, yard, shipping and maintenance areas and the Roaster area.

i. **Emergency Spill:** Applicant shall:

- i. Document the occurrence of an Emergency Spill, fire or explosion requiring implementation of the contingency plan and describe the cause of the emergency situation and the action taken. The Applicant shall retain the documentation on-site at the Facility until corrective action pursuant to ORC Chapter 3734 is completed.
- ii. Determine whether cleanup residuals destined for disposal meet the definition of a characteristic hazardous waste or are defined as a listed hazardous waste, other than listed hazardous waste, K171 or K172, pursuant to OAC rule 3745-52-11. Cleanup residuals meeting the definition of a hazardous waste shall be managed according ORC Chapter 3734 and the hazardous waste management rules promulgated thereunder.

j. **Incidental Spill:** Applicant Shall:

- i. Clean up Incidental Spills of Reclaimed Catalyst within twenty-four hours following discovery. Ohio EPA will be notified if Applicant determines that more than twenty-four hours is required for cleanup. It is understood that Incidental Spills of Reclaimed Catalyst and Process Residuals are inherent in the routine handling of materials and facility operations. When an Incidental Spill occurs, it does not constitute a violation of this Variance when addressed according to this condition.
- ii. Determine whether cleanup residuals destined for disposal meet the definition of a characteristic hazardous waste or are defined as a listed hazardous waste, other than listed hazardous waste, K171 or K172, pursuant to OAC rule 3745-52-11. Cleanup residuals meeting the definition of a hazardous waste shall be managed according to ORC Chapter 3734 and the hazardous waste management rules promulgated thereunder.

- k. **Inspection Procedures and Report Forms:** Applicant shall maintain, and revise as necessary, Facility inspection procedures and inspection report forms, and implement Facility inspections as provided in the Application for the following areas of the Facility: RMSB and associated fugitive emissions, tracking reduction, Roasters, security systems, Railcar Unloading Area and emergency and safety equipment.
- l. **Inspections:** The designated areas of the Facility as noted on the Applicant's inspection table shall be inspected a minimum of the frequencies given in the inspection procedures in the Application when the unit(s) is/are in operation except the RMSB sumps and liquid detection ports shall be inspected a minimum of once a calendar day when material containing Free Liquid is managed in the RMSB. A unit is in operation when it is processing or holding material. Each unit shall be inspected for leakage, spillage, structural failure and structural damage. Each inspection shall be recorded on the appropriate inspection report form and the form retained on-site at the Facility for three (3) years.
- m. **Training:** Applicant shall maintain, revise as necessary, and implement an employee training program as described in the Application for those employees who handle Reclaimed Catalyst. The training components will include contingency plan, Reclaimed Catalyst handling, process, supervisor, and employee refresher training. Each employee shall be trained within the timescales defined in OAC rules 3745-65-16(B) and (C). Documentation of training shall be retained on-site at the Facility for three (3) years.
- n. **Equipment Maintenance:** Applicant shall maintain in good working order the equipment used to handle, store, convey and contain Reclaimed Catalyst. The equipment includes but is not limited to: containers (including transport vehicles), RMSB dual containment systems, loading and unloading areas, sumps, Roaster, piping and conveyance systems.
- o. **Renewal of Variance:** In the event that this Variance expires prior to a final action of the Director to renew or reissue this Variance, the Applicant may continue to operate in accordance with the terms and conditions of the expired variance until a new variance is issued or denied provided that:
 - i. The Applicant submits a complete application for a renewal variance at least one hundred eighty (180) days before the expiration date of this Variance unless permission for a later submittal date has been authorized by the Director prior to the expiration date of this Variance;
 - ii. Through no fault of the Applicant a new variance has not been issued pursuant to OAC rule 3745-50-23 on or before the expiration date of the previous variance.

p. **Sampling and Remediation Plan:** Within thirty (30) days after the date any of the events described in Section XI:

- i. Applicant shall prepare and submit to Ohio EPA a Sampling and Remediation Plan (SRP) that meets the requirements in OAC rules 3745-66-11(A) and (B), 3745-66-97 and 3745-66-14, for all areas at the Facility where Reclaimed Catalyst, Roasted Catalyst and Process Residuals were managed or stored except where processed in the EAFs.
- ii. The Applicant shall provide the public notice of the opportunity to review and submit written comments on the SRP. The notice shall be published in a major local newspaper of general circulation in the area where the facility is located. The public notice shall provide that comments must be submitted within thirty (30) days of the date of the notice to the following address:

Ohio Environmental Protection Agency
Division of Environmental Response and Revitalization
Lazarus Government Center
P. O. Box 1049
Columbus, Ohio 43216-1049

- iii. The SRP is subject to Ohio EPA review and approval. Applicant shall submit the SRP to Ohio EPA according to Section XIII. If Ohio EPA does not approve the SRP and provides Applicant with a written statement of deficiencies, Applicant shall revise the SRP or submit a new SRP for approval that corrects the stated deficiencies within thirty (30) days after receipt of such written statement. Ohio EPA may approve the SRP with modifications. If Ohio EPA modifies the SRP, the modified SRP becomes the approved SRP.
- iv. Upon receipt of the approved SRP, Applicant shall implement the approved SRP, in accordance with the requirements of OAC rules 3745-66-11(A) and (B), 3745-66-97 and 3745-66-14 and the specifications and schedule in the approved SRP.
- v. Within thirty (30) days after completion of work required by the approved SRP, Applicant shall submit to Ohio EPA, for review and approval, a certification that the work was conducted in accordance with the approved SRP. The certification must be signed by Applicant and must follow the format in OAC rule 3745-50-42(D).
- vi. The signed certification must be submitted to Ohio EPA, in accordance with Section XIII. Ohio EPA retains the right to inspect the Facility and take samples, photographs and notes, access process records, logs, invoices, analytical data, etc, prior to, during, and subsequent to certification of the SRP. If after inspection and review of the Facility, Ohio EPA does not

conclude that the Facility meets the conditions of the certified SRP, it shall deem the “certified” SRP invalid and cleanup of the Facility inadequate.

- vii. Within thirty (30) days of notice that the “certified” SRP is invalid, Applicant shall prepare and submit a revised SRP to Ohio EPA indicating how it intends to correct the deficiencies or problems. Upon receipt of approval of the revised SRP, Applicant shall, within forty-five (45) days, implement the revised SRP and submit a signed, revised certification of cleanup to Ohio EPA. As illustrated above, Ohio EPA retains the right to inspect the Facility and Applicant’s records to ascertain whether or not the Facility has satisfactorily been cleaned up.
- 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 Cambridge Facility for further reclamation, the Applicant shall notify Ohio EPA prior to scheduled shipment(s). At a minimum the notification shall include, estimated quantity of Reclaimed Catalyst, an estimated date(s) of the shipment(s), and an explanation why the shipment(s) is necessary.
 - iii. In the unlikely event that Applicant will no longer own or operate the Facility, Applicant shall submit notification as soon as practicable prior to such scheduled change.
- 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.

Nothing in this Section shall be construed as in any way limiting Ohio EPA's access, inspection and information gathering rights and authorities, including enforcement authorities related thereto, under any applicable statute or regulation.

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:

1. Monitoring the implementation or use of this Variance;
2. Conducting sampling;
3. Inspecting and copying records, contracts, and other documents and information related to the implementation or use of this Variance; and,
4. Verifying any data and other information submitted to Ohio EPA.

Nothing in this Section shall be construed as in any way limiting Ohio EPA's access, inspection and information gathering rights and authorities, including enforcement authorities related thereto, under any applicable statute or regulation.

VIII. OTHER APPLICABLE LAWS

All actions taken pursuant to this Variance shall be undertaken in accordance with the requirements of all applicable local, state, and federal laws and regulations. This Variance does not waive or compromise the applicability and enforcement of any other statutes or regulations applicable to Applicant.

IX. OTHER CLAIMS

Nothing in this Variance shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership or corporation, not a party to this Variance, for any liability arising from, or related to, the operation of Applicant's Facility.

X. REVOCATION

1. The following are causes for revoking a variance during its term:
 - a. Noncompliance by the Applicant with any condition of the variance;
 - b. The Applicant's failure in the Application or during the variance issuance process to disclose fully all relevant facts, or the Applicant's misrepresentation of any relevant facts at any time; or,
 - c. A determination that the Facility is operated in a manner that endangers human health or the environment.

XI. TERMINATION

1. Unless otherwise terminated by the Director, this Variance shall terminate ten (10) years after the effective date of this Variance, or when any of the following event occurs:
 - a. Director revokes Variance.

XII. MODIFICATIONS

This Variance may be modified by agreement of the parties hereto. Modifications shall be in writing and shall be effective on the date entered in the journal of the Director of Ohio EPA.

XIII. NOTICE

All documents required to be submitted by Applicant pursuant to this Variance shall be addressed to:

Ohio Environmental Protection Agency
Southeast District Office
Division of Environmental Response and Revitalization
2195 Front Street
Logan, Ohio 43138

and Ohio EPA Central Office at the following address:

For mailings, use the post office box number:

Ohio Environmental Protection Agency
Division of Environmental Response and Revitalization
Lazarus Government Center
P. O. Box 1049

Columbus, Ohio 43216-1049

For deliveries to the building:

Ohio Environmental Protection Agency
Division of Environmental Response and Revitalization
Lazarus Government Center
50 West Town St. Suite 700
Columbus, Ohio 43215

or to such persons and addresses as may hereafter be otherwise specified in writing by Ohio EPA.

XIV. RESERVATION OF RIGHTS

Ohio EPA reserves its right to exercise its lawful authority to require Applicant to perform corrective action at the Facility, at some time in the future, pursuant to ORC Chapter 3734 or any other applicable law. Applicant reserves its rights to raise any administrative, legal or equitable claim or defense with respect to any final action of the Director regarding such corrective action. Ohio EPA and Applicant each reserve all other rights, privileges and causes of action, except as specifically waived in Section XV of this Variance.

XV. WAIVER

Without admission of any of the findings made under this Variance, the Applicant agrees that this Variance is lawful and reasonable and agrees to comply with all terms and conditions contained herein.

Applicant hereby waives the right to appeal the issuance, terms and conditions, notice, service, implementation, modification, termination or revocation of the Variance, and hereby waives any and all rights Applicant may have to seek administrative or judicial review of this Variance either in law or equity.

Notwithstanding the preceding, Ohio EPA and Applicant agree that if this Variance is appealed by any other party to the Environmental Review Appeals Commission, or any court, Applicant retains the right to intervene and participate in such appeal. In such an event, Applicant shall continue to comply with this Variance notwithstanding such appeal and intervention unless this Variance is stayed, vacated or modified.

XVI. EFFECTIVE DATE

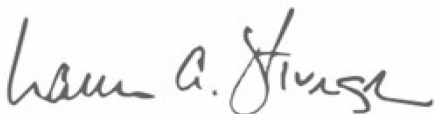
The effective date of this Variance is the date this Variance is entered into the Ohio EPA Director's journal.

XVII. SIGNATORY AUTHORITY

Each undersigned representative of a party to this Variance certifies that he or she is fully authorized to enter into this Variance and to legally bind such party to this Variance.

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



Printed or Typed Name



Title

4/19/2021

Date

ATTACHMENT A

Financial Requirements for AMG Vanadium LLC

Cost estimate.

(a) The Applicant must have a detailed written estimate, in current dollars, of the cost of disposing of Reclaimed Catalyst as listed hazardous waste, and the cost of decontaminating the units and areas where the Reclaimed Catalyst was stored, as required by Section V.3.g of the Variance.

(1) The estimate must equal the cost of conducting the activities described in paragraph (a) of this section at the point when the extent and manner of the Facility's operation would make these activities the most expensive; and

(2) The cost estimate must be based on the costs to the Applicant of hiring a third party to conduct these activities. A third party is a party who is neither a parent nor a subsidiary of the Applicant.

(3) The cost estimate may not incorporate any salvage value that may be realized with the sale of the Reclaimed Catalyst, facility structures or equipment, land, or other assets associated with the Facility.

(4) The Applicant may not incorporate a zero cost for Reclaimed Catalyst that might have economic value.

(b) During the active life of the facility, the Applicant must adjust the cost estimate for inflation within 60 days prior to the anniversary date of the establishment of the financial instrument(s) used to comply with OAC rule 3745-55-43. If the Applicant is using the financial test or corporate guarantee, the cost estimate must be updated for inflation within 30 days after the close of the firm's fiscal year and before submission of updated information to the director as specified in OAC rule 3745-55-43(F)(3). The adjustment may be made by recalculating the cost estimate in current dollars, or by using an inflation factor derived from the most recent Implicit Price Deflator for Gross National Product published by the U.S. Department of Commerce in its Survey of Current Business, as specified in paragraphs (b)(1) and (2) of this Attachment. The inflation factor

is the result of dividing the latest published annual Deflator by the Deflator for the previous year.

(1) The first adjustment is made by multiplying the cost estimate by the inflation factor. The result is the adjusted cost estimate.

(2) Subsequent adjustments are made by multiplying the latest adjusted cost estimate by the latest inflation factor.

(c) During the active life of the facility, the Applicant must revise the cost estimate no later than 30 days after a change in a Facility's operating plan or design that would increase the costs of conducting the activities described in paragraph (a) or no later than 60 days after an unexpected event which increases the cost of conducting the activities described in paragraph (a) of this section. The revised cost estimate must be adjusted for inflation as specified in paragraph (b) of this section.

(d) The owner or operator must keep the following at the Facility during the operating life of the facility: The latest cost estimate prepared in accordance with paragraphs (a) and (c) and, when this estimate has been adjusted in accordance with paragraph (b), the latest adjusted cost estimate.

(e) A copy of the Facility's current, detailed written estimate prepared and maintained in accordance with paragraphs (a) and (b) of this Attachment must be submitted annually to the director of Ohio EPA.

(1) If Applicant is using a mechanism other than the financial test, such submittal of the written estimate to the director must be made within sixty days following a revision or update to the estimate made in accordance with paragraph (b) of this Attachment;

(2) If the Applicant is using a financial test, such submittal to the director must be made within ninety days after the close of the Applicant's fiscal year following a revision or update to the estimate made in accordance with paragraph (b) of this Attachment.

(f) The Applicant may submit a Recycling Contingency Agreement (RCA) to operate as an alternative to providing costs for disposing of

Reclaimed Catalyst as listed hazardous waste as required in paragraph (a). The RCA must provide an alternate cost estimate in the agreement. The RCA must be approved by the director prior to any reduction in the cost estimate required in paragraph (a).

(1) The Applicant, within sixty (60) days prior to anniversary date of the establishment of the financial instrument(s) required by condition 3.g.(ii) of the variance, shall submit to Ohio EPA a certified, as described in OAC Rule 3745-50-42(D), a certificate of good standing from each recycler which a RCA is signed, showing the company is still active. In lieu of the certificate of good standing, the Applicant may submit to Ohio EPA a new RCA.

(2) If either the Applicant or recycler provide notice of termination of the RCA to the other, the Applicant shall provide Ohio EPA written notice of one hundred and twenty (120) days prior to the RCA's termination. Within thirty (30) days after the notice, the Applicant shall provide a revised cost estimate including the cost of disposal of reclaimed catalyst in accordance with paragraph (a) and (c).

(3) The director may disallow the use of the RCA to reduce the cost estimate required in paragraph (a) based on a reasonable belief that the RCA may not be able to be performed as agreed upon. Within thirty (30) days after notice from the director of disallowing the RCA, the Applicant shall provide a revised cost estimate including the cost of disposal of reclaimed catalyst in accordance with paragraph (a) and (c).

(4) In the event the Applicant establishes a new RCA, a renewal of an RCA, or a certificate of good standing, the Applicant shall submit the document(s) in accordance with Section XII to Ohio EPA.