



Modified Ohio Hazardous Waste Facility Installation and Operation Permit

Division of Environmental Response and Revitalization

Permittee: AMG Vanadium, LLC U.S. EPA ID: OHD 042 319 244

Facility Name: AMG Vanadium, LLC

Mailing Address: 60790 Southgate Road

City: Cambridge State: OH Zip: 43725

Operator Name: AMG Vanadium, LLC

Mailing Address: 60790 Southgate Road

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Facility Street Address: 60790 Southgate Road

City: Cambridge State: OH Zip: 43725

Permit Modification

This Modified Ohio Hazardous Waste Facility Installation and Operation Permit is issued pursuant and subject to Section 3734.05(I) of the Ohio Revised Code and Rule 3745-50-51(D) of the Ohio Administrative Code.

The Ohio Hazardous Waste Facility Installation and Operation Permit for the facility with the above-referenced ID number as issued by the Ohio Environmental Protection Agency and journalized on May 2, 2008, and as subsequently modified by the Ohio Environmental Protection Agency, is hereby incorporated by reference in its entirety, except as it may be modified herein. This modification of the permit shall remain in effect until such time as the Ohio Hazardous Waste Facility Installation and Operation Permit is renewed, modified, withdrawn, suspended, or revoked.

The Permittee shall comply with all requirements of the modified permit application as amended or supplemented on April 28, 2017 and July 20, 2017. The information contained in the modified permit application is incorporated herein by reference. Specifically, all written statements regarding the specifications, locations, or capabilities of the processes, equipment, containment devices, safety devices or programs, or other matters made by the applicant in the permit modification application are hereby incorporated as express, binding terms and conditions of this modified permit.

The modified Terms and Conditions of this permit are attached hereto and are incorporated herein by reference. The modified Terms and Conditions supersede and replace the corresponding pages found in the May 2, 2008 renewal permit.

Permit Modification Approval

Entered into the Journal of the Director on:

[Click here to enter a date](#)

Date:

Craig W. Butler, Director
Ohio Environmental Protection Agency

MODULE A - GENERAL PERMIT CONDITIONS

A. GENERAL PERMIT CONDITIONS

A.1 Effect of Permit

ORC Sections 3734.02 (E) and (F) and 3734.05
OAC Rule 3745-50-58(G)

- (a) The Permittee is authorized to store hazardous waste in containment buildings in accordance with the terms and conditions of this Ohio hazardous waste permit (hereinafter "permit"), ORC Chapter 3734, all applicable Ohio hazardous waste rules, all applicable regulations promulgated under the Resource Conservation and Recovery Act (RCRA), as amended, and the permit application. The permit application, as submitted to Ohio EPA on December 9, 2002, and last updated on April 28, 2017, is hereby incorporated into this permit. In the instance of inconsistent language or discrepancies between the above, the language of the more stringent provision shall govern.
- (b) Any management of hazardous waste not authorized by this permit is prohibited, unless otherwise expressly authorized or specifically exempted by law. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, or invasion of other private rights. Compliance with the terms and conditions of this permit does not obviate Permittee's obligation to comply with other applicable provisions of law governing protection of public health or the environment including but not limited to the Community Right to Know law under ORC Chapter 3750.

A.2 Permit Actions OAC Rule 3745-50-58(F)

This permit may be modified or revoked as specified by Ohio law. The filing of a request by the Permittee for a permit modification, or the notification of planned changes or anticipated noncompliance on the part of the Permittee, does not stay any permit term or condition

otherwise noted in this permit). This “clean” version of the permit application should also include a complete and updated table of contents and ensure all tables, sections and associated references/citations are accurate. This permit application must be submitted as a Class 1 permit modification requiring prior approval of the Director pursuant to OAC Rule 3745-50-51. Any changes to the permit application submitted with this updated version that are inconsistent with or not authorized by this final permit must be clearly identified and follow the appropriate process outlined in OAC Rule 3745-50-51.

- (ii) Because part of the RMSB is located on the boundary of the 100-year floodplain, the Permittee is to revise the sentence in the first bullet item on page 2-17, section 2.12 of the permit application, to state that the RMSB is located partially within the area designated as the 100-year floodplain. In accordance with OAC Rule 3745-50-44 (A)(11)(d), the Permittee is to submit structural or other engineering studies or drawings documenting that the entire building is elevated above the flood level identified in FEMA maps and showing that the elevation and other design elements will prevent washout. The updated permit application is to be submitted as a Class 1 permit modification in accordance with OAC Rule 3745-50-51.

(b) Requirements for new storage area RSMB #3:

- (i) At least thirty (30) days prior to commencing construction at the Facility, the Permittee shall submit to Ohio EPA all relevant detailed final design and construction plans covering each aspect of the proposed construction. The final design and construction plans mean final design and specifications necessary for the commencement of construction.
- (ii) A schedule of new construction including the estimated starting and completion dates.
- (iii) If the final plans, as submitted, are inconsistent with the conceptual and/or preliminary plans contained in the approved permit application and with the terms and conditions of this permit, such submittal may be considered by Ohio EPA as information constituting a change to the permitted Facility and thus require submission of a permit modification.
- (iv) Upon completion of construction, the Permittee shall submit to Ohio

EPA, when applicable, by certified mail or hand delivery, a “certificate

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of use and occupancy” issued by the Building Official in accordance with OAC Rule 4101:2-1-27 and certification stating that the construction was completed in compliance with applicable rules, the terms and conditions of this permit, applicable state building codes (e.g., codes for fire, electrical service, and plumbing), and the approved permit application.

- (v) No later than sixty (60) days after completion of new construction, “as built” drawings shall be submitted to Ohio EPA. If the submitted “as built” drawings appear inconsistent with the construction design plans submitted under Permit Condition A.27(b)(i), such submittal may be considered by Ohio EPA as information constituting a change to the permitted facility and thus require submission of a permit modification.
- (vi) No hazardous waste shall be stored at the newly constructed portion(s) of the facility until Ohio EPA, in accordance with OAC Rule 3745-50-58(L), has inspected such portion(s) of the facility and finds that it is in compliance with all applicable rules, the terms and conditions of this permit, and the approved permit application.
- (vii) At least sixty (60) days prior to the receipt of hazardous waste in any modified or newly constructed portions of the Facility, the Permittee shall submit updated financial requirements for closure of the facility and liability requirements in accordance with the permit modification procedures. This includes the cost estimate for closure as required OAC Rule 3745-55-42, financial assurance for facility closure as required by OAC Rule 3745-55-43, and liability insurance as required by OAC Rule 3745-55-47.

A.28 Information to be Maintained at the Facility
OAC Rule 3745-54-74

- (a) Unless otherwise specified by the hazardous waste rules, the Permittee must maintain at the facility, until closure is completed and certified by an independent, registered professional engineer, pursuant to OAC Rule 3745-55-15, and until the Director releases the Permittee from financial assurance requirements pursuant to OAC Rule 3745-55-43, the following documents (including amendments, revisions and modifications):
 - (i) waste analysis plan, developed and maintained in accordance with OAC Rule 3745-54-13 and the terms and conditions of this permit;
 - (ii) contingency plan, developed and maintained in accordance with OAC Rule 3745-54-53 and the terms and conditions of this permit;

MODULE B - GENERAL FACILITY CONDITIONS

B. GENERAL FACILITY CONDITIONS

B.1 Design and Operation of Facility OAC Rule 3745-54-31

- (a) The Permittee must design, construct, maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, ground water or surface waters which could threaten human health or the environment.
- (b) The Permittee must not accept more than 45,000 tons of K171 and K172 in any one calendar year from off-site sources during the life of the permit, until such time as this permit condition is modified or renewed. This is a facility wide limitation and includes all units.
- (c) The Permittee shall use engineering controls (e.g., enclosed conveying systems, loading ports and transport vehicles) and implement procedures at the facility to minimize the release of K171/K172 spent catalyst, and fugitive dust from spent catalyst, during the loading, transport and all other stages of management of spent catalyst at the plant.
- (d) The Permittee shall use engineering controls and implement procedures at the facility to minimize the release of LimeAdd™ fugitive dust outside the silo during the loading of transport vehicles.

B.2 Required Notices OAC Rule 3745-54-12

(a) Hazardous Waste from Off-Site Sources

When the Permittee is to receive hazardous waste from an off-site source (except where the Permittee is also the generator), the Permittee must inform the generator in writing that the Permittee has the appropriate permits, and will accept the waste the generator is shipping. The Permittee must keep a copy of this written notice as part of the operating record.

B.12 Required Aisle Space
OAC Rule 3745-54-35

At a minimum, the Permittee must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, as required by OAC Rule 3745-54-35.

B.13 Arrangements with Local Authorities
OAC Rule 3745-54-37

- (a) The Permittee must comply with the requirements of OAC Rule 3745-54-37(A) by making a diligent effort to:
 - (i) make arrangements and familiarize all emergency response agencies which are likely to respond in an emergency with the location and layout of the facility, properties of hazardous waste managed at the facility and associated hazards, places where facility personnel will normally be working, entrances to and roads inside the facility, and possible evacuation routes as depicted and explained in Section 3 and Attachment F of the permit application;
 - (ii) make arrangements with Ohio EPA emergency response teams, emergency response contractors, and equipment suppliers;
 - (iii) make arrangements to familiarize local hospitals with the properties of hazardous waste handled at the facility and types of injuries or illnesses which could result from fires, explosions, or releases at the facility; and
 - (iv) make agreements designating primary emergency authority to a specific police and a specific fire department and make agreements with any others to provide support to the primary emergency authority, where more than one police and fire department may respond to an emergency.
- (b) Where authorities decline to enter into such agreements or arrangements set forth in OAC Rule 3745-54-37(A), the Permittee must document the refusal in the operating record as required by OAC Rule 3745-54-37(B)

MODULE E - CORRECTIVE ACTION REQUIREMENTS

In July 1995, an agreed order was issued by the Guernsey County Court of Common Pleas which required former site owners Shieldalloy Metallurgical Corporation and Cypress Foote Mineral to perform a remedial investigation and feasibility study (RI/FS). These companies performed the RI/FS and in January 1997, Ohio EPA approved the RI/FS report. In April 1997, Ohio EPA issued a Decision Document for the site which selected and summarized the components of the remedy to be implemented. On April 14, 1997, a Permanent Injunction Consent Order (PICO), which was issued by the Guernsey County Court of Common Pleas, set forth the Remedial Design/Remedial Action (RD/RA) phases of work. Remedial Action activities began in 2003 and were completed in 2006. They included the excavation and consolidation of vanadium contaminated sediments on the West Slag Pile, and capping of the West Slag Pile under Ohio's solid waste rules. The East Slag Pile was also capped under the solid waste rules. Monitoring of contamination under the Maintenance Building has been agreed to and implemented by the Permittee.

Any newly discovered units or new releases are addressed under condition E.10 of the permit.

E.1 Corrective Action at the Facility **OAC Rules 3745-50-10 & 3745-54-101**

In accordance with OAC Rule 3745-50-10 "waste management unit" means any discernible unit at which solid waste, hazardous waste, infectious waste (as those terms are defined in ORC Chapter 3734), constructions and demolition debris (as defined in ORC Chapter 3714) industrial waste, or other waste (as those terms are defined in ORC Chapter 6111), has been placed at any time, irrespective of whether the unit was intended for the management of waste or hazardous waste. Such units include any area at a facility at which wastes have been routinely and systematically released. For the purpose of Corrective Action, facility is defined as all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA. The terms Interim Measure (IM), RCRA Facility Investigation (RFI), Corrective Measures Study (CMS) and Corrective Measure Implementation (CMI) are defined in U.S. EPA's Corrective Action Plan (CAP) (OSWER Directive 9902.3-2A, May 1994).

The Permittee must institute Corrective Action as necessary to protect human health and the environment for all releases of hazardous wastes or hazardous constituents from any waste management units (WMUs) at the Facility, regardless of the time at which waste was placed in such units.

E.2 Corrective Action Beyond the Facility Boundary
OAC Rule 3745-54-101

The Permittee must implement Corrective Action beyond the Facility property boundary, where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of Ohio EPA that, despite the Permittee's best efforts, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the Facility boundary where off-site access is denied. On-site measures to address such releases will be addressed under the RFI, CMS, and CMI phases, as determined to be necessary on a case-by-case basis.

E.3 Identification of WMUs
OAC Rules 3745-50-44(D) and 3745-54-101

Ohio EPA has identified the former bulk mixing area beneath and adjacent to the present Raw Material Storage Building #1 (RMSB #1) as a WMU requiring further investigation. Prior to the construction and utilization of the RMSB #1, raw materials were stored and blended at the bulk mixing area west of the Mill Building. This WMU will be addressed through the Corrective Action process on closure of the RMSB #1. AMG has identified RMSB #1 and RMSB #2 as WMUs.

E.4 Reserved

E.5 RCRA Facility Investigation (RFI)
OAC Rule 3745-54-101

The Permittee must conduct an RFI to thoroughly evaluate the nature and extent of the release of hazardous wastes and hazardous constituents from all applicable WMUs identified in Permit Condition E.3 above and Permit Condition E.10. The major tasks and required submittal dates are shown below. The scope of work for each of the tasks is found in U.S. EPA's CAP.

(a) RFI Workplan

The Permittee must submit a written RFI Workplan to Ohio EPA no later than 90 (ninety) days prior to closure of the RMSB or, in case of a newly discovered waste management unit, on a time frame established by Ohio EPA.

MODULE G - CONTAINMENT BUILDING STORAGE

G. MODULE HIGHLIGHTS

RMSB #1 is approximately 275 feet by 215 feet and has a total storage capacity of approximately 11,000 cubic yards. RMSB #1 is a completely enclosed steel frame building with a reinforced concrete floor that serves as a primary barrier. RMSB #1 consists primarily of dry storage that may be used for storing spent catalyst and other materials that do not contain free liquid and an approximately 35 ft by 35 ft wet storage area used for storing spent catalyst and other materials that contain free liquid. The wet storage area includes a sump and secondary containment system with a primary and secondary liner. A free liquid drainage layer and collection system is installed above each liner. The total secondary containment capacity of the wet storage area is approximately 14,000 gallons.

Raw Material Storage Building #2 (RMSB #2) has a footprint of approximately 42,190 square feet and a total storage capacity of approximately 13,388 cubic yards. RMSB #2 is a completely enclosed steel frame building with a reinforced concrete floor and interior walls that serve as a primary barrier. RMSB #2 can be used for both dry and wet storage of spent catalyst and other materials that contain free liquids.

Future Raw Material Storage Building #3 (RMSB #3) is anticipated to have an approximate footprint of 35,144 square feet and a total storage capacity of approximately 13,305 cubic yards.

Spent catalyst is delivered to the facility primarily in bulk railcars. The railcar is weighed and sampled upon arrival according to the Waste Analysis Plan (Attachment C of the permit application). The railcar is unloaded using an enclosed conveyor. If the material is to be stored in RMSB #2, the conveyor discharges into RMSB #2. This material is then, as demand requires, transported to storage areas in RMSB #2 by heavy equipment, or transported directly to the Roaster Feed Hoppers without prior storage in a RMSB. Alternatively, if the spent catalyst is to be stored in RMSB #1, the enclosed conveyor will discharge to a covered dump truck for transport. Spent catalyst will be relocated to RMSB #2 prior to roasting. Spent catalyst or wastes may also be delivered to the site by truck (bulk or containerized) or in Vac Boxes by truck or rail. In these instances, the material would be weighed then offloaded directly in a RMSB or at the unloading dock at the rear of the Mill Building where they would be staged for less than 48 hours prior to being transferred into a RMSB.

For prevention of tracking by personnel and equipment, there are tracking reduction procedures which consist of inspection and decontamination. Personnel exiting the building-RMSBs are required to brush boots while standing on a raised grate and dispose of PPE in a receptacle within the RMSBs (as applicable) just prior to exiting. Drivers exiting the

RMSBs must inspect and remove any waste clinging to the vehicle prior to exiting and must re-inspect the vehicle just after exiting. Any materials tracked outside the RMSBs are immediately cleaned up. All such inspections of personnel and vehicles are logged.

For fugitive dust management, doors to the RMSBs are closed at all times unless vehicles are entering or leaving the building. Daily visual emission inspections of roof vents and door openings occur when activities are taking place in the RMSBs. Every two weeks, the roof vents are monitored visually using the Method 22 procedure from vantage points outside the RMSBs. Wastewater generated onsite during manufacturing is collected and mixed into waste piles within the RMSBs to suppress dust creation.

G.1 Containment Buildings Storage/Quantity Limitation

- (a) The Permittee is authorized to store 37,693 cubic yards of hazardous waste at any given time in the permitted Containment Buildings as detailed in the following table:

Storage Area	Capacity (Cubic Yards)	Type of Containment	Description of Waste
RMSB #1	11,000 CY	bulk piles and containers	D006, D007, D010, K171/K172; spent catalyst
RMSB #2	13,388 CY	bulk piles and containers	D006, D007, D010, K171/K172; spent catalyst
RMSB #3	13,305 CY	bulk piles and containers	D006, D007, D010, K171/K172; spent catalyst

For the purpose of determining compliance with storage limitation, materials covered by "variance from classification as a waste" originally issued September 26, 2006 and as amended on November 18, 2008 must be included in storage totals.

The Permittee must store hazardous waste in the manner described in Sections 8 and 9 of the permit application. The Permittee must clearly mark

each area or container which contains hazardous waste restricted from land disposal under OAC Chapter 270 to identify its contents and the date each period of accumulation begins.

- (b) Permit Condition G.1(a) shall not apply to the Permittee's activities as a generator accumulating hazardous waste on-site in compliance with OAC Rule 3745-52-34.

However, when accumulating waste within a permitted Containment Building, in accordance with OAC Rule 3745-52-34, the Permittee must not, for the total amount of hazardous waste stored and accumulated, exceed the maximum Containment Building inventory established under this permit condition.

G.2 Reserved

G.3 Waste Identification

The Permittee is authorized to store in the Containment Buildings only the EPA hazardous waste numbers specified in Part A of the permit application.

G.4 Design and Construction Standards
OAC Rules 3745-205-100 & 3745-205-101 (A)

The constructed Containment Buildings are described in Section 9 of the permit application and must comply with the following design and construction standards:

- (a) The Containment Buildings must be completely enclosed with a floor, walls, and a roof to prevent exposure to the elements (e.g., precipitation, wind, run-on), and to assure containment of managed wastes.
- (b) The floor and containment walls of the Containment Buildings must be designed and constructed of materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy

equipment that operate within the building; and to prevent failure due to pressure gradients, settlement, compression, or uplift; physical contact with the wastes to which they are exposed, climatic conditions, and the stresses of daily operation (including the movement of heavy equipment within the unit and contact of such equipment with the containment walls).

- (c) The Containment Buildings shall have a primary barrier designed to withstand the movement of personnel, waste, and handling equipment in the Containment Building during the operating life of the Containment Buildings and appropriate for the physical and chemical characteristics of the waste to be managed.
- (d) Has controls sufficient to prevent fugitive dust emissions to meet the no visible emission standard in paragraph (C)(1)(d) of rule 3745-205-101 of the Administrative Code.
- (e) Is designed to ensure containment and to prevent the tracking of materials from the unit by personnel or equipment.

G.5 Operating Standards
OAC Rule 3745-205-101(C)

The constructed Containment Buildings described in Section 9 of the permit application must comply with the following operating standards:

- (a) The Permittee must use controls and practices to ensure containment of the hazardous waste within the Containment Buildings; and, at a minimum:
 - (i) Maintain the primary barrier to be free of significant cracks, gaps, corrosion, or other deterioration that could cause hazardous waste to be released from the primary barrier.
 - (ii) Maintain the level of the stored hazardous waste within the containment walls of the Containment Buildings so that the height of any containment wall is not exceeded.

- (iii) Take measures to prevent the tracking of hazardous waste out of the building by personnel or by equipment used in handling the waste, including trucks off-loading waste.
 - (iv) Use engineering controls to prevent to prevent particulates and fugitive dust emissions from exiting any openings (doors, windows, vents, roof vents, cracks, etc.) so that all openings exhibit no visible emissions. In addition, all associated particulate collection devices (e.g., fabric filter, electrostatic precipitator) shall be operated and maintained with sound air pollution control practices. This state of no visible emissions shall be maintained effectively at all times during routine operating and maintenance conditions, including when vehicles and personnel are entering and exiting the Containment Buildings.
- (b) The Permittee must maintain a certification by a qualified registered professional engineer that the Containment Buildings design meets the requirements of paragraphs (A) to (C)(4) of OAC Rule 3745-205-101.
- (c) Throughout the active life of the Containment Buildings, the Permittee must repair, promptly upon detection, any condition that could lead to or has caused a release of hazardous waste in accordance with OAC Rule 3745-205-101(C)(3)(a) through (c).
- (d) Incompatible hazardous wastes must not be placed in the Containment Buildings or their secondary containment systems, if they could cause the Containment Buildings or secondary containment systems to leak, corrode, or otherwise fail.

G.6 Inspection Schedules and Procedures
OAC Rules 3745-54-15 and 3745-54-73

The Permittee must inspect the Containment Buildings in accordance with the inspection schedule contained in Attachment D of the permit application and in accordance with OAC Rule 3745-54-15. The inspection schedule must be written such that the Permittee must inspect and record in the facility's operating record data gathered from monitoring equipment, leak detection equipment, the

Containment Buildings, and the area immediately surrounding the Containment Buildings at least once every seven days in order to detect signs of releases of hazardous waste. The Permittee must note the results of these inspections in the inspection log along with any remedial action taken.

G.7 Recordkeeping
OAC Rule 3745-54-73

- (a) The Permittee must comply with all record keeping requirements of OAC Rule 3745-54-73 as part of the facility operating record.
- (b) After each shipment of hazardous waste is received and has been placed into storage, the Permittee must log into a storage area daily report the following information:
 - (i) quantity of waste in the storage area;
 - (ii) waste type and description;
 - (iii) date waste was received into the storage area;
 - (iv) waste location (by storage area);
 - (v) date waste was removed from the storage area;
 - (vi) Permittee load number and/or container sequence number;
 - (vii) generator name.

G.8 Special Provisions for Ignitable or Reactive Waste
OAC Rules 3745-54-17

- (a) The Permittee must not store or treat ignitable or reactive waste except in accordance with OAC Rule 3745-54-17.
- (b) The Permittee must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste and shall follow the storage procedures specified in Sections 8 and 9 of the permit application.

G.9 Closure and Post-Closure
OAC Rules 3745-55-10 through 3745-55-20, and 3745-205-102

At closure of each Containment Building, the Permittee must remove or decontaminate all hazardous waste and hazardous waste residues, contaminated containment system components, contaminated subsoils, and structures and equipment contaminated with waste and leachate, in accordance with Section 6 of the permit application and the procedures in the closure plan set forth in Attachment G of the permit application.

END OF PERMIT CONDITIONS