NPDES Inspection Report – Pretreatment Categorical Industrial User

National Database Information	
Inspection Entry Date/Time: February 27, 2025 / 0800	Inspection Type: **Pretreatment Categorical Industrial User (CIU)**
Inspection Closing Date/Time: February 27, 2025 / 0846	NPDES ID Number: MTPF00104
Inspection ID: 202502_MTPF00104	
Lead inspector and affiliation: Lisa-kay Prideaux / EPA Region 8 Montana Operations Office	

Facility Location Information (*Name/Location/ Mailing Address*)	
Site/Facility Name & Location: **Boulder River Foundry** **151 Centennial Drive** **Big Timber, Montana 59011** **45.838424°N; -109.940753°W**	Mail Report (Electronic Delivery) to: **Randy Rembold, Owner** **Boulder River Foundry** **randy@boulderriverfoundry.com**

Contact Information	
	Name(s)/Title
Person/Company meeting definition of Owner/Operator	**Boulder River Foundry**
Facility Contacts:	**Randy Rembold / Boulder River Foundry / Owner (present during inspection)**
	Kirk Bryan / Boulder River Foundry / Owner (not present)
	Robert Bryan / Boulder River Foundry / Owner (not present)
	Phyllis Bryan / Boulder River Foundry / Owner (not present)
	Lucinda Bryan / Boulder River Foundry / Owner (not present)
Authorized Official(s)	**Randy Rembold / Boulder River Foundry / Owner**

Areas Evaluated During Inspection		
Permit	Effluent/Receiving Waters	Compliance Schedule
Records/Reports	Flow Measurement	**Pollution Prevention**
Facility Site Review	Self-Monitoring Program	Laboratory
Stormwater	**Operations and Maintenance**	**Pretreatment**

Report Review and Signature		
Drafter Name	Address/Phone Number	Date
LISA-KAY PRIDEAUX Digitally signed by LISA-KAY PRIDEAUX Date: 2025.04.02 09:21:42 -06'00'	**U.S. EPA Region 8, Montana Operations Office** **Prideaux.Lisakay@epa.gov** **406-457-5022**	**03.06.2025**
Reviewer Name	Address/Phone Number	Date
Monica Crosby	**U.S. EPA Region 8** **Crosby.monica@epa.gov** **303-312-6196**	**03/12/2025**
Management Reviewer Signature	Address/Phone Number	Date
EMILIO LLAMOZAS Digitally signed by EMILIO LLAMOZAS Date: 2025.04.01 16:33:45 -06'00'	**U.S. EPA Region 8** **NPDES & Wetlands Section Supervisor** **Llamozas.Emilio@epa.gov**	**04/01/2025**
Emilio Llamozas	**303-312-6407**	

Inspection Narrative and Site Description

Introduction

The Environmental Protection Agency (EPA) promulgated regulations at 40 C.F.R. Part 403 establishing the General Pretreatment Regulations and pretreatment standards for various point source categories at 40 C.F.R. Parts 405 – 471. These regulations are designed to regulate the introduction of pollutants into publicly owned treatment works (POTWs) that are determined not to be susceptible to treatment by such treatment works or which could interfere with the operation of such treatment works. The State of Montana has not sought authorization to administer the pretreatment component of the National Pollution Discharge Elimination System (NPDES) program, and the City of Big Timber has not developed an EPA-approved pretreatment program. The EPA administers the pretreatment portion of the NPDES program in Montana and is the pretreatment "Control Authority," as defined by 40 C.F.R. Part 403.3(f), for industrial users that discharge to the Big Timber POTW. The Big Timber POTW discharges into the Boulder River.

Metal molding and casting facilities that discharge wastewater to a POTW are subject to the categorical Metal Molding and Casting Point Source Category Pretreatment Standards. The 40 C.F.R. Part 464 and Subpart C – Ferrous Casting Subcategory (40 C.F.R. Part 464.30) states, "The provisions of this subpart are applicable to discharges to waters of the United States and to the introduction of pollutants into publicly owned treatment works resulting from ferrous casting operations as defined in 40 C.F.R. Part 464.02(c)." Ferrous casting is defined in 40 C.F.R. Part 464.02(c) and states, "The remelting of ferrous metals to form a cast intermediate or finished product by pouring the molten metal into a mold. Except for grinding scrubber operations which are covered here, processing operations following the cooling of castings are covered under the electroplating and metal finishing point source categories (40 C.F.R. Parts 413 and 433)."

On Thursday, February 27, 2025, at approximately 0800, EPA Lisa-kay Prideaux (inspector) conducted an announced pretreatment Significant Industrial User (SIU) inspection of the Boulder River Foundry (facility) located at 151 Centennial Drive in Big Timber, Montana. The purpose of the inspection was to evaluate the facility's compliance with the requirements in 40 C.F.R. Parts 403 and 464 for the General Pretreatment Regulations and Metal Molding and Casting Point Source Category Pretreatment Standards (Subpart C), respectively. The inspector met with Mr. Randy Rembold, one of five owners. The inspector presented inspector credentials to Mr. Rembold and held an opening conference to explain the purpose of the inspection and discussed the role of the EPA regarding pretreatment regulations in Montana. The inspector asked a series of questions throughout the inspection; responses to the questions, observations, and photograph descriptions were documented in a field logbook. All photographs taken during the inspection are included in the attached photo log and are maintained by EPA in accordance with the Quality Assurance Field Activities Procedure and Standard Operating Procedure.

Facility Description and Process Overview

Mr. Rembold provided an overview of the operations and processes at Boulder River Foundry. The facility has been operating since 1995 and is an investment casting (also referred to as lost-wax casting) company, which pours molten steel into ceramic molds and displaces the wax molds. Steel investment casting is a metal forming method to produce parts with complex structures, accurate dimensions, and

good surface finish. The facility operates daily; however, the hot tank process only operates approximately 20-25 times per year. The facility uses up to 12 tons of steel per year.

The process starts by forming a wax mold of the desired steel components. The wax mold is then dipped into a ceramic slurry (containing sand, a refractory, and a binder) to create a ceramic mold, referred to as the investment. The investment production process requires multiple steps, including coating the wax mold with ceramic slurry, stuccoing the ceramic slurry coat with a coarse sand material, and then allowing the investment to dry. These steps are repeated until the investment reaches the desired thickness. Once the investment is complete and dry, the wax mold and ceramic investment are heated using a dewaxing autoclave, which melts the wax out of the investment (lost-wax casting). Approximately 30 to 40% of the wax can be reclaimed; the remaining wax removed by the autoclave is disposed of as garbage. Once the wax mold has been removed from the ceramic shell, the shell is then taken to the pour room, where the ceramic shell is first heat-treated in the facility's electronic ovens. The pour room contained the facility's electronic oven units and molten steel pouring operation. Once the ceramic shells have been heat treated, molten steel can be poured into the ceramic shells and cast. Once the steel has been cast into the investment, the cast is allowed to solidify. Once the cast steel component has solidified, the ceramic mold is then divested off the cast steel component by hammering the ceramic material into pieces. The ceramic shell negative removed from the cast is disposed of as garbage. To fully remove the ceramic material from the cast steel component, the component is soaked in a 150-gallon tank of heavy alkaline solution (hot tank) containing a mixture of 75 gallons of water and 75 gallons of a 45% potassium hydroxide concentration solution to dissolve the remaining ceramic material. Steel parts are removed from the hot tank and rinsed over the hot tank to remove the caustic solution and any residual particles. Parts undergo a second spray rinse in a portable sink located next to the hot tank.

Process wastewaters are generated from the hot tank and spray rinse sink. Due to the temperature of the hot tank, water must be periodically added. There is a float system that adds water to the hot tank once it gets below a certain level. When the production cycle is complete, the rinse water from the sink is recycled back into the hot tank via a sump pump. The sink does not completely drain with the use of the sump pump, so the facility allows the remaining liquid at the bottom of the sink to evaporate. The hot tank solution is spent when the potassium hydroxide solution is unable to fully dissolve the ceramic material, approximately 2-3 years depending on use. When it is time to dispose of the hot tank solution, the facility pumps the solution into a drum, adds sulfuric acid to the spent caustic solution to lower the pH to 9.5 and turn the solution into a gel, floor dry (a granular absorbent) is then added to the drum, and mixed thoroughly to absorb and solidify the solution. A chemical representative assisted the facility to determine the appropriate ratio of sulfuric acid to use to lower the pH to the desired target level. The waste material is then added to heavy construction plastic bags and sent to the local transfer site to be disposed of in the City of Billings Class II landfill. The facility representative indicated that the resulting waste is not hazardous and therefore is disposed of in a landfill.

Records

After the facility representative provided a background description of the facility operations, the inspector asked for documents regarding the transfer of the hot tank mixture to the landfill. Mr. Rembold showed the documents for the last transfer. On July 6, 2023, approximately 40 gallons of hot tank solution were treated with sulfuric acid to a pH of 3.5-3.9 su, and floor dry absorbent to allow for disposal of 8.25 bags in the landfill. Standard Operating Procedures and Material Safety Data Sheets

are maintained for all processes and chemicals on-site. The facility is currently under an Administrative Order on Consent (CWA-08-2019-0010) which requires the issuance of a Notice of Discharge Requirements before the Administrative Order on Consent can be closed out. The facility was provided an application form on April 30, 2024, as part of the March 27, 2024, compliance evaluation inspection report. Mr. Rembold stated he has started the process of completing the application; however, has some questions and concerns with the information required. The inspector stated she would have EPA's pretreatment coordinator reach out and provide assistance.

Site visit

After the facility representative interview and records review, Mr. Rembold walked the inspector around each of the processes. We started in the shell room, observing the wax molding machine and two tanks containing slurry for ceramic molds (photo 158). One tank contained silica and the other zircon. The room contained various wax molds and ceramic shell casts (photo 157). This room also contained a dewaxing autoclave, which is used to remove the wax mold from the ceramic shell once hardened. We then moved to the pour room. The pour room contains the facility's electronic oven units and molten steel pouring operation (photo 159). Casting operations were not occurring at the time of the inspection. This area of the facility is also used to divest the ceramic shell negative off the cast steel component by hammering off the ceramic. Next, we moved into the hot tank room (photo 160). The hot tank room contains the facility's 150-gallon hot tank used to dissolve any remaining ceramic material from the cast steel component (photo 165). This room also contains the facility's portable hot tank spray-off sink, cooling tower unit, and a non-process domestic use sink. The hot tank is only operated when there are parts to be cleaned; steel parts can remain in the hot tank for 1-3 days with daily rinsing. When the 150-gallon hot tank is not used, it is covered but not drained; the hot tank solution is reused until spent. The spray sink in the hot tank room is where casted components leaving the hot tank are spray rinsed (photos 162 & 163). During this process, the sink fills with rinse water; when the casting process is complete, the water is pumped (via a sump pump) into the hot tank for recycling. During the pumping process, water is not completely pumped down as the sump pump leaves approximately 1-2 inches of water at the bottom of the sink. Facility staff stated the water is left to evaporate. When the hot tank is not processing, the sink is covered and moved to a different part of the room to stay out of the way. There is a sink located adjacent to the hot tank, which is only used for non-process water rinsing and is discharged to the Big Timber POTW. When the sink is in use for non-process water, the drain in the sink is opened using two valves on the drainpipe (photo 161). This room has a floor drain connected to the City of Big Timber's POTW, which has a plug screwed into the piping and covered. Although the facility does not discharge, the floor drain in the hot tank room remains plugged unless there was use of the emergency eye wash and/or shower. The hot tank room has a process standard operating procedure for the hot tank, portable sink, and floor drain posted on the wall (photo 164).

In a separate room at the facility, chemicals are stored where there is no floor drain or outlet. All chemical drums are marked.

Closing and Follow-Up

A closing conference was held on-site with Mr. Rembold, during which the process for the inspection report was discussed. The inspection concluded at approximately 0846.