NPDES Inspection Report – Pretreatment Categorical Industrial User

National Database Information	
Inspection Entry Date/Time: August 15, 2022 / 15:45	Inspection Type: **Pretreatment Categorical Industrial User (CIU)**
Inspection Closing Date/Time: August 15, 2022 / 16:51	NPDES ID Number: MTPF00104
Inspection ID: 202208_MTPF00104	
Lead inspector and affiliation: Lisa-kay Prideaux / EPA Region 8 Montana Operations Office	
Inspector and affiliation: Emilio Llamozas / EPA Region 8	

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)
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	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	Date	Address/Phone Number
Prideaux, LisaKay Digitally signed by Prideaux, LisaKay Date: 2022.10.13 07:41:41 -06'00'	**09.22.2022**	**U.S. EPA Region 8, Montana Operations Office** **10 West 15th Street, Suite 3200** **Helena, Montana 59626** **406-457-5022**
Reviewer Name	Date	Address/Phone Number
Emilio Llamozas	**09/28/2022**	**U.S. EPA Region 8** **1595 Wynkoop Street** **8ENF-W-NW** **Denver, Colorado 80202** **303-312-6407**
Management Reviewer Signature	Date	Address/Phone Number
MICHAEL BOEGLIN Digitally signed by MICHAEL BOEGLIN Date: 2022.10.13 07:09:00 -06'00'		**U.S. EPA Region 8** **1595 Wynkoop Street** **8ENF-W-NW** **Denver, Colorado 80202** **303-312-6250**
Michael Boeglin, NPDES and Wetlands Enforcement Section Supervisor		

Inspection Narrative and Site Description

Introduction

EPA promulgated regulations at 40 C.F.R. part 403 establishing the General Pretreatment Regulations and the Point Source Categorical Standards. These regulations are designed to regulate the introduction of pollutants into POTWs which 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 EPA approval of its authority 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. EPA administers the pretreatment portion of the NPDES program in Montana and is the pretreatment "Control Authority," as defined by 40 C.F.R. § 403.3(f), for industrial users that discharge to the Big Timber, Montana Publicly Owned Treatment Works (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. § 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. § 464.02(c)." Ferrous casting is defined in 40 C.F.R. § 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 Monday, August 15, 2022, at approximately 15:45, U.S. Environmental Protection Agency (EPA) inspectors Lisa-kay Prideaux and Emilio Llamozas (inspectors) 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. EPA inspectors introduced themselves and met with Mr. Randy Rembold, one of five owners. The inspectors presented their inspector credentials to Mr. Rembold. The inspectors held an opening conference to explain the purpose of the inspection and discussed the role of the EPA regarding pretreatment regulations in Montana. Inspectors asked a series of questions throughout the inspection; observations and photograph descriptions were documented in a field logbook. All photographs taken during the inspection are included in the attached photo log.

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 one day a week for up to 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 casted. Once the steel has been casted into the investment, the cast is allowed to solidify. Once the steel component cast has solidified, the ceramic mold is then divested off the casted 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 casted 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 are also spray rinsed in a rinse sink located next to the hot tank. Process wastewaters are generated from the hot tank and spray rinse sink. The facility installed two shut off valves, with a standpipe in between the two valves, to prevent discharge of process wastewater generated from the final 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. The rinse water from the sink is recycled back into the hot tank at the end of a production cycle. The hot tank solution is spent when the 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, and then floor dry is added and mixed 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 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 inspectors asked if the facility had a slug discharge control plan to which Mr. Rembold stated since the operations have changed from discharging to non-discharging, a slug discharge control plan was not needed. Inspectors asked for documents regarding the transfer of the hot tank mixture to the landfill. Mr. Rembold showed the documents for the last transfer. On February 19, 2020, 35 gallons of hot tank solution were treated with sulfuric acid to a pH of 6.7-7.4 su, and floor dry to dispose of eight bags in the landfill. On March 3, 2020, 40 gallons of solution were treated to a pH of 6.6-7.1 su, and 10 bags were transferred to the landfill. Material Safety Data Sheets are kept for all chemicals on-site.

Site visit

After the facility representative interview and records review, Mr. Rembold walked the inspectors around each of the processes. We started in the shell room, observing the wax molding machine (photo 614), and two tanks containing slurry for ceramic molds (photo 615). One tank contained silica and the other zircon. The room contained various wax molds, and ceramic shell casts. 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. 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 casted steel component by hammering off the ceramic. Next, we moved into the hot tank room. The hot tank room contains the facility's 150-gallon hot tank used to dissolve any remaining ceramic material from the casted steel component. This room also contains the facility's cooling tower unit and a hot tank spray off sink (photo 617). 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 with a lid. This room has a floor drain connected to the City of Big Timber's POTW. The floor drain in the hot tank room remains unplugged outside of when the hot tank is in use (photo 616). The floor drain is located within a few feet of the hot tank, which contains the potassium hydroxide solution. The drain remains open due to the emergency eye wash and shower being located in the room. The drain also receives wastewater overflow from the boiler condensate and the overflow from the cooling tower (non-contact). When the hot tank is not in use, it is not drained. The spray sink in the hot tank room is where casted components leaving the hot tank are spray rinsed. During this process, the sink is plugged by closing two valves to the overflow pipe, and when spraying is completed, the water is pumped (via 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. When the

hot tank is not processing, the sink is used for non-process water rinsing and is discharged to the Big Timber POTW. Because the process wastewater is not completely drained (1-2 inches of water remain at the bottom of the sink), it mixes with the non-process water prior to being discharged.

In a separate room at the facility, chemicals are stored (photo 618) 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 preliminary findings, as well as the process for the inspection report was discussed. The inspection concluded at approximately 17:00. On August 29, 2022, the EPA sent an email to Mr. Rembold with the preliminary findings from the inspection. In the August 29, 2022 email, the inspector explained the process for closing out the Administrative Order on Consent (AOC). However, the facility must fully comply with all requirements in the AOC, including addressing the two findings listed below before the AOC can be closed. The August 29, 2022 email, also included a permit application for the facility to complete and send to EPA Region 8.

Findings, Corrective Actions and Recommendations

Finding #1: The facility was discharging metal molding and casting process wastewater to the POTW.
Specifically, the spray sink in the hot tank room is the where casted components leaving the hot tank are spray rinsed. During this process, the sink is plugged by closing two valves to the overflow pipe, and when spraying is completed, the water is pumped (via 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. When the hot tank is not processing, the sink is used for non-process water rinsing and discharged to the Big Timber POTW. Because the process wastewater is not completely drained, it mixes with the non-process wastewater prior to being discharged; therefore, there is a discharge of diluted process wastewater to the POTW.

Pretreatment Requirement:
40 CFR Part 403.1(b)(1) states National pretreatment standard regulations apply to pollutants from non-domestic sources covered by Pretreatment Standards which are indirectly discharged into or transported by truck or rail or otherwise introduced into POTWs.

Industrial users that discharge wastewater regulated by a categorical process, such as ferrous metal molding and casting, are considered Significant Industrial Users, pursuant to 40 C.F.R. § 403.3(v). Therefore, the facility is considered a Significant Industrial User (SIU).

40 CFR Part 403.6(d) states "Except where expressly authorized to do so by an applicable Pretreatment Standard or Requirement, no Industrial User shall ever increase the use of process water, or in any other way attempt to dilute a Discharge as a partial or complete substitute for adequate treatment to achieve compliance with a Pretreatment Standard or Requirement…"

Corrective Action:
Immediately cease discharge of pollutants from the metal molding and casting process at the Facility or comply with the CWA and the pretreatment regulations, including 40 C.F.R. parts 403 and 464, for any future discharge(s) of wastewater. Per Administrative Order on Consent Docket No. CWA-08-2019-0010, signed by Mr. Rembold on September 19, 2019, and filed with the EPA Region VIII Hearing Clerk on September 26, 2019, the facility was ordered to "Immediately cease discharge of pollutants from the Facility and provide a report to the EPA explaining how the metal molding and casting wastewater is now being disposed." Additionally, the AOC required the Facility to, "Comply with the CWA and the pretreatment regulations, including 40 CFR parts 403 and 464, for any future discharge(s) of wastewater." In your response to the EPA, indicate how the facility has addressed this finding.

Finding #2: The facility did not have a slug discharge control plan and there was a potential for slug discharges to occur at the facility

Specifically, when the hot tank is not in use, it is not drained; therefore, processing liquid (potassium hydroxide solution) within the hot tank remains. The floor drain in the hot tank room remains unplugged when the hot tank is not in use (photo 616). The floor drain is located within a few feet of the hot tank (photo 617). The hot tank could spill or leak onto the floor of the process area which leads to the floor drain connected to the Big Timber POTW. There is also potential for spills to occur during the removal of spent chemicals and adding new chemicals to the tank. For these reasons, Boulder River Foundry should have a slug discharge control plan if the floor drain in not permanently plugged.

Pretreatment Requirement:

According to the requirements at 40 C.F.R. §403.8(f)(2)(vi), "if the POTW decides that a slug control plan is needed, the plan shall contain, at a minimum, the following elements:

(A) Description of discharge practices, including non-routine batch Discharges;
(B) Description of stored chemicals;
(C) Procedures for immediately notifying the POTW of Slug Discharges, including any Discharge that would violate a prohibition under §403.5(b) with procedures for follow-up written notification within five days;
(D) If necessary, procedures to prevent adverse impact from accidental spills, including inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site run-off, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants (including solvents), and/or measures and equipment for emergency response."

Corrective Action:

Develop a slug discharge control plan for the facility that includes all the elements described above in 40 C.F.R. §403.8(f)(2)(vi), or alternatively completely eliminate the potential slug discharge at the facility. Options to eliminate the potential slug discharge could include but are not prescriptive or limited to: (1) secondary containment under the processing hot tank or (2) moving the emergency eye wash/shower, overflow from the boiler condensate, and overflow from the cooling tower to another area and permanently plugging the floor drain in the hot tank processing room. In your response to the EPA, indicate how the facility has addressed this finding.

Recommendation #1:

The facility should consider creating standard operating procedures (SOPs) for processes from steel molding and casting through the hot tank and rinse sink, process of plugging the floor drain, process of the spray sink (shut off valves and sump to hot tank) how to clean the hot tank through disposal at the landfill (including calculations of acid and floor dry mixing).