

NPDES Inspection Report – Pretreatment Categorical Industrial User

National Database Information	
Inspection Entry Date/Time: March 27, 2024 / 14:00	Inspection Type: Pretreatment Categorical Industrial User (CIU)
Inspection Closing Date/Time: March 27, 2024 / 15:08	NPDES ID Number: MTPF00104
Inspection ID: 202403_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)
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	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
<u>Records/Reports</u>	Flow Measurement	<u>Pollution Prevention</u>
<u>Facility Site Review</u>	Self-Monitoring Program	Laboratory
Stormwater	<u>Operations and Maintenance</u>	<u>Pretreatment</u>

Report Review and Signature		
Drafter Name	Address/Phone Number	Date
Prideaux, LisaKay Digitally signed by Prideaux, LisaKay Date: 2024.04.30 11:56:57 -06'00'	U.S. EPA Region 8, Montana Operations Office Prideaux.Lisakay@epa.gov 406-457-5022	04.09.2024
Reviewer Name	Address/Phone Number	Date
Stephanie Passarelli	U.S. EPA Region 8 Passarelli.stephanie@epa.gov 303-312-6803	04.11.2024
Management Reviewer Signature	Address/Phone Number	Date
EMILIO LLAMOZAS Digitally signed by EMILIO LLAMOZAS Date: 2024.04.30 11:40:59 -06'00'	U.S. EPA Region 8 NPDES & Wetlands Section Supervisor Llamozas.Emilio@epa.gov	04/26/2024
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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 Tuesday, March 27, 2024, at approximately 14:00, U.S. Environmental Protection Agency (EPA) inspector 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 introduced herself and 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; 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 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 undergo a second 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 spray sink has one outlet pipe due to the sink being used for non-process practices. 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. The valves remain in shutoff positions unless the sink is being used for non-process purposes. 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 sump pump. The sink does not completely drain with the use of the sump pump, so the facility uses a shop vac to remove the remaining liquid and any debris at the bottom of the sink. Excess water and debris are placed in a drum for evaporation. 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 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 was 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.

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. 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 (photos 786 & 787). This room also contains the facility's cooling tower unit and a hot tank spray off 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. This room has a floor drain connected to the City of Big Timber's POTW, which is screwed into the piping and covered (photo 788). The floor drain in the hot tank room remains plugged unless there were use of the emergency eye wash and/or shower. When the 150-gallon hot tank is not used it is covered but not drained; 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 787 & 789). During this process, the sink fills with rinse water; when the casting process is complete, 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. Facility staff then remove the remaining water with a shop vac and place the excess water into a drum where it is left to evaporate. When the hot tank is not processing, the sink is 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 790). The valves remain in the off position unless non-process water is being discharged.

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 15:08

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. When the hot tank is not being used for processing, the sink is used for non-process water rinsing and discharged to the Big Timber POTW. Although the process wastewater is drained and pumped out with a shop vac, there continues to be residue of the potassium hydroxide solution on the

walls and bottom of the sink and therefore, it mixes with the non-process wastewater prior to being discharged creating 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 to the POTW 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.” Options to eliminate the discharge to the POTW from the metal molding and casting process could include but are not prescriptive or limited to separating the use of the sink for process and non-process water via the addition of an additional sink that is only used for non-process water. In your response to the EPA, indicate how the facility has addressed this finding.

Recommendation #1:

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. Included as an attachment to this inspection report, is a Notice of Discharge Requirements Application for Boulder River Foundry to complete and submit to the EPA.