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Refer to:
SHB08-GN001

April 25, 2019

VIA MESSENGER DELIVERY & E-MAIL
Commissioner Julie Morita, M.D.
Chicago Department of Public Health ("CDPH")
333 South State Street
Room 200
Chicago, Illinois 60604
Julie.Morita@cityofchicago.org

RE: S.H. Bell Company
10218 South Avenue O
Chicago, Illinois

Request for Concurrence and Alternative Request for Variance
Rules For Control of Emissions from the Handling and Storage of Bulk Materials

Dear Commissioner Morita:

Our firm represents S.H. Bell Company ("SHB") which is authorized by the State of Illinois to operate a facility located at 10218 South Avenue O, Chicago, Illinois (the "Facility"). The Facility is a U.S. Customs Bonded warehouse that provides supply chain warehousing, distribution, and fulfillment services for metal, mineral, and semi-finished industrial material commodities, most of which are imported internationally, that are used as essential raw materials in manufacturing, *e.g.,* steel production and metal castings production. The Facility is zoned Planned Manufacturing District No. 6, Lake Calumet ("PMD 6"). We hereby submit this correspondence requesting concurrence that pig iron is not a "Manganese-Bearing Bulk Material" under the City of Chicago Department of Public Health ("CDPH") – Rules for Control of Emissions from the Handling and Storage of Bulk Materials (the "Rules"), as promulgated on January 25, 2019. Alternatively, we hereby submit this correspondence pursuant to Section 10.0 of the Rules seeking a variance for pig iron from the new requirements contained in Part D, Section 5.0 of the Rules for Manganese-Bearing Bulk Material Facility Operations.

The requirements in the new Part D for Manganese-Bearing Bulk Material Facility Operations contained in the Rules promulgated on January 25, 2019 are a major revision to the Rules as proposed on April 18, 2018 and also to the prior bulk material regulations that were enacted by the

City of Chicago on March 13, 2014. Importantly, in keeping with SHB's commitment to go above and beyond in complying with all federal, state and local regulations and ensuring the protection of the community, SHB is ***not*** seeking a variance from any of the new Part D requirements for any Affected Materials (as defined in its CDPH-approved Fugitive Dust Plan), including bulk ferromanganese and silicomanganese handled at the Facility.

Since 2014, SHB has spent over $3 million in capital and soft costs for enhanced fugitive dust controls and air monitoring at the Facility and it will incur significant additional costs in complying with the new Part D, Section 5.0 enclosure requirements for its Affected Materials, including bulk ferromanganese and silicomanganese. This is an extraordinary sum and commitment for this small family-owned business and demonstrates SHB's commitment to the City and surrounding community.

As discussed more fully below, SHB requests concurrence that pig iron is not a "Manganese-Bearing Bulk Material" as defined by Part A, Section 2.0(16) in the Rules. The pig iron that SHB typically handles at the Facility generally contains less than 0.05% of manganese and the only potential fugitive dust (although very unlikely based on SHB's approved fugitive dust controls) from pig iron is iron oxide. Nonetheless, out of an abundance of caution based on CDPH's published comment and response document for the Rules, SHB is alternatively seeking a variance from the Part D, Section 5.0 enclosure requirements for pig iron. Compliance with the new Part D, Section 5.0 enclosure requirements for pig iron is arbitrary and not necessary at the Facility because, as discussed in detail below, SHB is able to demonstrate through almost two years of particulate matter (PM) and metals monitoring data that its current CDPH-approved fugitive dust controls for pig iron (along with all of the other bulk commodities handled at the Facility) are highly effective in ensuring that there is no impact to the surrounding community.

I. SUPPORTING INFORMATION

A. SHB's Approved Fugitive Dust Plan and Fugitive Dust Controls

CDPH approved the Facility's Fugitive Dust Plan on December 22, 2017.[1] Subsequent to the approval, SHB submitted an updated Fugitive Dust Plan to CDPH on January 31, 2018 (the "January 2018 FDP") that incorporated the use of new completed dust control measures as communicated to CDPH in a status update letter dated January 12, 2018. Otherwise, the January 2018 FDP is the same as the Fugitive Dust Plan approved by CDPH in its December 22, 2017 letter to SHB and thus, for ease of reference, the January 2018 FDP is referred to as the "CDPH-approved Fugitive Dust Plan" throughout the rest of this submittal.[2] The Facility is currently complying with its CDPH-approved Fugitive Dust Plan and has installed and implemented enhanced dust control measures, at significant expense, since the Rules were first enacted in 2014.

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[1] *See* https://www.chicago.gov/content/dam/city/depts/cdph/InspectionsandPermitting/ApprovalLetter.pdf

[2] Except for the noted updates, the January 2018 FDP is also the same as the November 2017 revised FDP submitted to CDPH on November 7, 2017 that contained the agreed upon revision to the Dust Monitoring Contingency Plan, but was otherwise the same as the September 2017 FDP referenced in CDPH's December 22, 2017 approval letter.

To date, S.H. Bell has invested over $3 million in capital and soft costs for enhanced dust control measures at the Facility, which include:

1. New enhanced water truck;
2. New sweeper truck;
3. New dry fog system;
4. Four new Monsoon misting units;
5. New dust suppressant application truck;
6. Storage tank and pump system for calcium chloride mixture for road application;
7. Barge (dry dock) truck loading shed that can be connected to the portable dust collector;
8. 40,000 cfm portable dust collector;
9. Raildock unloading enclosure with duct work for the portable dust collector;
10. New dust collection duct work at the crusher/screener;
11. Steel rollup doors on the crusher/screener;
12. Door on the west end of Norcon bulk storage building;
13. Full-time environmental employee that is EPA Method 9 certified;
14. Covered the railcar conveyor;
15. Meteorological station;
16. Installation and operation of four continuous FEM PM_{10} monitors and two filter-based FRM PM_{10} monitors;
17. A wind/dust screen along the dividing wall in the middle of the Norcon building;
18. A bulk load out shed with a 40,000 cfm dust collector at both the Norcon and Ryerson buildings;
19. Loader tunnel with a permanent stationary dust collector for the Box Filling Station at the initial drop to the hopper feeder;
20. Addition of a dump pan enclosure with a permanent stationary dust collector for full size off-site truck unloading of Affected Materials;

21. Additional 28,000 cfm portable dust collector;
22. Duct work to allow the portable rail conveyor to be vented to the portable dust collector and a ventilated hood with sides at the end of the conveyor that will enclose the loading spout/sock and extend all the way down to the top of the rail car; and
23. Duct work for the box car dock enclosure to allow use of the portable dust collector.

Each of these measures have been undertaken to further reduce any potential dust or PM_{10} from operations at the Facility. Items Nos. 18 through 23 listed above were implemented in the late summer/fall of 2017. Notably, the Norcon truck load-out dust collector became fully operational on August 16, 2017 and the Ryerson truck load-out dust collector became fully operational on August 29, 2017.

Additionally, CDPH-approved Fugitive Dust Plan includes stricter controls for Affected Materials[3] at the Facility, which SHB implemented at the Facility during the Fall of 2017. These more stringent controls for Affected Materials, as described in more detail in the CDPH-approved Fugitive Dust Plan, include automatic activity suspension during high wind conditions at transfer points, leaving the lids on barges during unloading, requiring all Affected Materials to be stored indoors, not allowing crushing, screening, or packaging of Affected Materials outdoors, and using the dump-pan enclosure with a portable dust collector for full-size truck unloading.

SHB also intends to comply with the new Part D, Section 5.0 enclosure requirements for Affected Materials at the Facility and is concurrently submitting for CDPH's review and approval an Enclosure Plan and an Amended Fugitive Dust Plan. Additionally, SHB has complied with Part D, Section 6.0 of the Rules through the timely submission of its Filter-Based Metals Monitoring Plan on February 22, 2019, which is currently awaiting approval from CDPH. The items outlined through construction schedules in the Enclosure Plan includes constructing the previously-committed full enclosure of the 3-sided bins adjacent to the Norcon building, a custom/first-of-its kind full enclosure with a dust collector for the barge unloading transfer point, and installation of automatic doors. These additional measures will result in SHB spending additional significant capital.

The enhanced dust control measures currently employed by the Facility as set forth in the CDPH-approved Fugitive Dust Plan, in its Amended Fugitive Dust submitted to CDPH today, and that will be constructed and implemented upon approval of the Enclosure Plan reflect SHB's ongoing commitment and dedication to ensure the safety of its workers and the community and to

[3] "Affected Materials" are defined in the CDPH-approved Fugitive Dust Plan as "ferromanganese materials and other materials with a manganese content (raw material, intermediate, or finished product) that are processed or otherwise handled on site in such a manner that could cause the generation of stack or fugitive emissions containing ferromanganese or manganese compounds. Affected Materials shall not include materials that contain manganese, such as steel ingots, where material is not a source of stack or fugitive emissions containing ferromanganese or manganese compounds."

implement the best in class fugitive dust control that goes well above and beyond current industry practice.

B. Analysis of Air Monitoring Data

To SHB's knowledge, it is the only non-petcoke bulk material facility in Chicago with over two years of both hourly PM_{10} and filter-based metals, including manganese, fence line monitoring data. As reported to CDPH every month with the submittal of the filter-based metals monitoring data, this data continues to objectively show impacts from offsite sources. Nonetheless, as expressed to CDPH previously, the monitoring data allows for a data-driven evaluation of the effectiveness of the Facility's fugitive dust control program. Accordingly, SHB asked RTP Environmental Associates ("RTP"), a nationally-recognized environmental consulting firm for its air quality expertise, to evaluate this air monitoring data, the results of which are included as Exhibit A.

RTP's graphical presentation of the Facility's air monitoring data shows a compelling picture that not only are the fugitive dust controls at the Facility highly effective, but also that the additional enhanced dust controls implemented in the late summer/fall of 2017 had a demonstrably positive impact on both measured PM_{10} and manganese levels at the Facility's fence line monitors. RTP concluded in its analysis that PM_{10} associated with the Facility are below the standards designed to provide public health protection. Additionally, the PM_{10} Reportable Action Level ("RAL"), as approved in the CDPH-approved Fugitive Dust Plan, has not been exceeded. RTP's analysis also shows that measured hourly PM_{10} levels improved after implementing the enhanced dust controls in the late summer/fall of 2017.

RTP also reviewed the manganese air monitoring data and specifically reviewed the 12-month moving average of the data, for comparison to the manganese MRL of 0.3 $\mu g/m^3$, and the 3-month moving average of the data, for comparison to CDPH's new Manganese Limit of 0.3 $\mu g/m^3$ as a 3-month rolling average. The manganese MRL of 0.3 $\mu g/m^3$, adopted by both U.S. EPA and ATSDR, is used to assess whether there is a potential (not automatic) health risk from inhaled respirable manganese by comparing the manganese MRL to long-term averages of PM_{10} manganese concentrations of at least a year.[4] Average PM_{10} manganese concentrations of at least

[4] U.S. EPA has adopted its chronic screening level for manganese (of 0.3 $\mu g/m^3$) from ATSDR's minimal risk level ("MRL") for manganese. *See* EPA Dose-Response Assessment for Assessing Health Risks Associated with Exposure to Hazardous Air Pollutants, Tables 1 and 2, *available at* https://www.epa.gov/fera/dose-response-assessment-assessing-health-risks-associated-exposure-hazardous-air-pollutants; *See* 79 Fed. Reg. 60238, 60247 (Oct. 6, 2014); 80 Fed. Reg. 37366, 37375 (June 30, 2015). ATSDR's manganese MRL of 0.3 $\mu g/m^3$ is used to assess whether there is a potential (not automatic) health risk from inhaled manganese by comparing chronic inhalation exposure to "respirable" manganese concentrations in the air. *See ATSDR Toxicological Profile for Manganese,* at p. 22. The manganese MRL is set below the level of chronic exposure that might cause adverse health effects in the people most sensitive to such chemical-induced effects. *See id.,* at p. A-1. "Respirable" manganese refers to the very small size of particles that can be inhaled into the deep lungs and is conservatively represented by particulate matter that is 10 microns or less (PM_{10}). *See id.,* at p. 22. "Chronic" in the context of the manganese MRL means only exposure to long-term averages of PM_{10} manganese concentrations of at least a year or more are compared to the manganese MRL.

a year that are below the manganese MRL means that there is no risk to human health from inhaled manganese. The 12-month moving average of manganese data collected at the Facility's fence line monitors from March 2017 through February 2019 has been consistently well below the manganese MRL. Thus, the air monitoring data demonstrates, as further discussed below in Section I.C, that there is no health risk to the community from the measured manganese levels at the Facility's fence line monitors.

A further noteworthy comparison in RTP's analysis is the comparison of the manganese air monitoring data to CDPH's new Manganese Limit since August 2017, as the 3-month moving averages of the manganese air monitoring data since that time have been consistently *less than half* of CDPH's new Manganese Limit. August 2017 is significant because that it when the first of SHB's additional enhanced dust control measures became operational, notably the two 40,000 cfm dust collectors at the Norcon and Ryerson truck load outs.[5] In fact, starting in August 2017 and continuing now for seventeen (17) consecutive months, whether averaged on a monthly or 3-month basis, the measured manganese levels at the Facility's fence line monitors have been well below 0.3 $\mu g/m^3$.

In fact, in submitting a revised Fugitive Dust Plan in September 2017 SHB correctly predicted to CDPH, that these truck load out dust collectors, along with the additional enhanced dust control measures, would positively impact the monitor readings and continue to ensure that there is no risk to the community from manganese. SHB appreciates CDPH's willingness after SHB's submittal of the revised Fugitive Dust Plan in September 2017 to allow SHB to collect additional monitoring data and to let the monitoring data results be used as the primary source of data to evaluate the effectiveness of the Facility's fugitive dust control program and the effectiveness of the new and enhanced measures. As RTP's analysis concludes, the enhanced dust control measures are and have been effective based on its analysis of the collected air monitoring data. Additionally, both the PM_{10} and manganese air monitoring data demonstrate that there is no risk to the community because the data is well below the relevant protective levels. Further

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Id. ATSDR has clearly stated that "[e]xposure to a level above the MRL does not mean that adverse health effects will occur." *See id.*, at p. A-1. ATSDR has also stated that "MRLs are not intended to define clean-up or action levels . . . MRLs are intended only to serve as a screening tool to help public health professionals decide where to look more closely." *Id.* Accordingly, daily, monthly, or even yearly averages of PM_{10} manganese concentrations above the manganese MRL do not mean that health effects will occur. Similarly, further evaluation of the data is only needed when yearly averages of PM_{10} manganese concentrations are above the MRL.

[5] August 2017 is also significant because U.S. EPA issued a NOV to the Facility on August 7, 2017, which was prior to the dust collectors becoming operational on the Norcon and Ryerson truck load outs. U.S. EPA issued the NOV because it alleged that the first-four month manganese average (March 2017 through June 2017) slightly exceeded 0.3 $\mu g/m^3$, even though the agency was well aware that the installation and operation of the new dust collectors at the truck load outs was forthcoming. The factual assertions regarding the average manganese levels in the NOV have been obsolete since August 2017 based on the manganese air monitoring data. SHB further maintains that the first-four month manganese average from monitoring data collected between March 2017 and June 2017 did not present any risk to the community based on a preliminary risk assessment provided to CDPH with SHB's submittal of the revised Fugitive Dust Plan in September 2017.

discussion on the absence of any health risk from the measured manganese levels is discussed below.

C. Air Risk Assessment

In response to CDPH's previous concern about the average levels of manganese measured at the filter-based PM_{10} monitors through June 2017, SHB engaged experts in manganese toxicology and in human health risk assessment (including a former Chief of Air Toxics Staff for U.S. EPA Region I) from Gradient to assess the risk to human health from the measured manganese levels.

Gradient conducted a preliminary risk assessment of manganese in the ambient air according to U.S. EPA's human health risk assessment procedures using data from March 2017 through August 2017 and concluded there is no risk to human health from the inhalation of manganese in the ambient air in the vicinity at the Facility and thus, there is no evidence that manganese in the ambient air near the Facility causes adverse health effects in the nearby community. SHB previously provided a copy of Gradient's preliminary risk assessment to CDPH with the submittal of its revised Fugitive Dust Plan in September 2017.

Recently, SHB engaged the experts at Gradient again to complete a final risk assessment of manganese in the ambient air based on the 23-months of manganese data collected by the filter-based fence line monitors at the Facility. Gradient's final risk assessment, which is attached hereto as Exhibit B, was done in accordance with established U.S. EPA risk assessment procedures to determine whether there is a risk or not from the measured manganese levels. Gradient used very conservative guidelines in conducting the evaluation such as assuming that a person was inhaling manganese in the outdoor air for 24 hours per day, for 350 days per year. Gradient reached the same conclusion as it did in its preliminary risk assessment which is that the manganese air monitoring data demonstrates that there is no risk to human health from the inhalation of manganese in the ambient air in the vicinity at the Facility and thus, there is no evidence that manganese in the ambient air near the Facility causes adverse health effects in the nearby community. Gradient also specifically concluded that there is no risk of adverse neurological effects for either the general population or sensitive subpopulations (such as children) from continuous inhalation of manganese in ambient air in the vicinity of the Facility.

Thus, Gradient's final risk assessment of the manganese air monitoring data collected at the Facility's fence line monitors, conclusively determines, using U.S. EPA's own risk assessment procedures, that there is no health risk to the surrounding community from manganese.

II. PIG IRON IS NOT A "MANGANESE-BEARING BULK MATERIAL"

In its January 25, 2019 response to comments on the Rules, CDPH indicated that all non-packaged bulk materials containing manganese, even those materials containing "a level of manganese that is so low as to be negligible" are considered a "Manganese-Bearing Bulk Material"

under the new Part D, Section 5.0 of the Rules. However, under the new Rules, a "Manganese-Bearing Bulk Material" is not so broadly defined and instead means "ferrous manganese, manganese silicate, manganese alloy, manganese ore, or any other material from which manganese is extracted or emitted or otherwise becomes airborne." *See* Section 2.0(15) of the Rules. CDPH's definition of a "Manganese-Bearing Bulk Material" thus includes only materials containing manganese that generate emissions containing manganese or materials from which manganese is "extracted." Pig iron contains a *de minimis* amount of manganese and to SHB's knowledge it is not a source of emissions containing manganese when stored and handled as a bulk material[6] nor is manganese "extracted" from pig iron and, thus, it should not be classified as a "Manganese-Bearing Bulk Material" under the Rules. Accordingly, SHB requests concurrence from CDPH for such a determination.

Pig iron is generally made from smelting iron ore to form an iron ingot and gets its name from the traditional mold to make these iron ingots which was a branching structure formed in sand that had many individual ingots at right angles on either side, resembling a litter of piglets being suckled by a sow.[7] When the molten iron had cooled and hardened, the smaller ingots (the pigs) were broken from the metal runner (the sow), hence the name pig iron.[8]

Both pig iron and steel are iron alloys.[9] Pig iron contains too much carbon to be formable or malleable by forging or rolling and, thus, is only useful as the iron feedstock material for steelmaking or re-melting into cast iron products.[10] Thus, there is clearly no material extraction, including manganese extraction (especially considering the *de minimis* manganese content discussed below) occurring from pig iron. Steel is an alloy of iron that is malleable at some temperature that contains carbon, manganese, and often other alloying elements.[11]

The manufacture of pig iron is described by U.S. EPA as follows:

> Iron blast furnaces produce molten iron (pig iron) that can be cast (molded) into products; however, the majority of pig iron is used as the mineral feedstock for steel production. . . The modern blast furnace consists of a refractory-lined steel shaft in which a charge is continuously added to the top through a gas seal. The charge

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[6] Under the Facility's CDPH-approved Fugitive Dust Plan, SHB generally defines "Affected Materials" as those materials containing manganese that are a source of emissions containing manganese in order to be consistent with terms it has been using since 2010 under Ohio EPA's Director's Final Findings and Orders for its Stateline facility. Neither SHB nor Ohio EPA have ever considered pig iron as an "Affected Material."

[7] The Making, Shaping, and Treating of Steel: Ironmaking volume, AISE Steel Foundation. 1999, *available at:* https://web.archive.org/web/20160304081818/http://jpkc.lut.cn/upload/20120523/20120523180839157.pdf#page=18

[8] *Id.*

[9] Gerald Houck, "Iron and Steel." from Minerals Yearbook Volume 1. Metals and Minerals, U.S. Bureau of Mines, 1992, at p. 645-46, *available at* http://images.library.wisc.edu/EcoNatRes/EFacs2/MineralsYearBk/MinYB1992v1/reference/econatres.minyb1992v1.ghouck.pdf

[10] *Id.*

[11] *Id.*

> consists primarily of iron ore, sinter, or pellets; coke; and limestone or dolomite. Iron and steel scrap may be added in small amounts. Near the bottom of the furnace, preheated air is blown in. Coke is combusted in the furnace to produce carbon monoxide which reduces the iron ore to iron. Silica and alumina in the ore and coke ash are fluxed with limestone to form a slag that absorbs much of the sulfur from the charge. Molten iron and slag are intermittently tapped from the hearth at the bottom. The slag is drawn off and processed. The product, pig iron, is removed and typically cooled, then transported to a steel mill operation for further processing in either an electric arc furnace or a basic oxygen furnace. [12]

The manufactured pig iron is comprised of approximately 94% iron and 5% carbon with *de minimis* amounts of silicon, manganese, sulfur, and phosphorous that together total approximately 1%.[13]

SHB does not produce or manufacture pig iron. Instead, pig iron is just one of the metal, mineral, and semi-finished industrial material commodities that SHB provides supply chain warehousing, distribution, and fulfillment services for to its customers. The Facility can store and handle the three different basic types of pig iron (basic, foundry, and high purity)[14] that are sold by its customers to end users in the steel and ferrous casting industries for use as iron feedstock. Within the past two years, the Facility typically only stored and handled high purity/nodular pig iron that has a manganese content of less than or equal to 0.05%. *See* Exhibit C.[15] In fact, in the past two years, the Facility has only transloaded one shipment of pig iron that was not considered high purity/nodular pig iron, which represented an extremely small percentage (0.015%) of overall amount of pig iron handled at the Facility. This one shipment of pig iron likewise had *de minimis* manganese content of only approximately 0.6%. Notably, the average manganese content of all outgoing shipments of pig iron from the Facility within the past two years was 0.031%.[16] For comparison to the pig iron typically handled at SHB, please note the manganese (Mn) content of the following materials from published governmental and scientific sources:

- Steel slag: 5%-8% Mn[17]

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[12] U.S. EPA, Final Technical Background Document, Identification and Description of Mineral Processing Sectors and Waste Streams, Iron and Steel, *available at* https://archive.epa.gov/epawaste/nonhaz/industrial/special/web/html/index-8.html

[13] International Iron Metallics Association Fact Sheet: Basic Pig Iron, *available at* https://www.metallics.org/assets/files/Public-Area/Fact-Sheets/_5_Basic_Pig_Iron_in_EAF_Fact_Sheet_rev3.pdf

[14] *See* https://www.metallics.org/pig-iron.html

[15] *Also available at*: https://www.metallics.org/assets/files/Public-Area/Fact-Sheets/_6_High_Purity_Pig_Iron_Fact_Sheet_rev4.pdf

[16] If CDPH needs and requests the backup supporting information for these statements regarding the pig iron handled and stored at the Facility during the past two years, SHB would be happy to provide this information under a separate submittal as it constitutes proprietary and confidential commercial or financial information that is exempt from public disclosure under Section 7(1)(g) of the Illinois Freedom of Information Act, 5 ILCS 140/1, *et seq.*

[17] *See* https://www.fhwa.dot.gov/publications/research/infrastructure/pavements/97148/059.cfm

- Ash from wood pellets/wood chips: 4% Mn[18]
- Structural steel: 0.5% to 1.7% Mn[19]
- Common types of rocks: 0.1% to 0.2% Mn[20]
- Basalt: 0.16% Mn[21]
- Average crustal rocks: 0.1% Mn
- Granitic rocks: 0.06% Mn[22]
- Pennsylvanian limestones of Illinois: ≥0.1% Mn[23]

Notably, limestone, trap rock (*e.g.,* basalt), and granitic rocks are the three most common types of rocks that are used to make crushed stone (commonly called aggregate or gravel).[24]

In its molten state pig iron can produce fumes and particulates; but at ambient conditions it is stable and its density is typically greater than 7.0 g/cm^3.[25] For comparison, the density of the coal, petcoke, and metcoke that the Rules were originally built around in 2014 are typically 1.35 g/cm^3, 1.4 g/cm^3, and 0.8 g/cm^3, respectively. Pig iron is supplied in a variety of ingot sizes and weights, ranging from approximately 7.7 lbs up to 100 lbs.[26] Accordingly, pig iron itself is not susceptible to becoming windborne.

The iron in pig iron, like the iron in non-galvanized steel, over time reacts with oxygen and moisture in the air to form iron oxides, which is commonly referred to as rust.[27] Pig iron is routinely kept at sufficient moisture, especially during the transfer process, to prevent the iron oxide rust scale from potentially flaking off and becoming windborne. It is SHB's understanding that this potential dust from the iron oxide (rust) flaking off pig iron is why CDPH considers to pig iron to be a Bulk Material under its Rules.[28] SHB is not aware of any specific studies analyzing

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[18] *See* https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/elemental-analysis-wood-fuel.pdf, at p. 39.
[19] *See* http://web.mit.edu/1.51/www/pdf/chemical.pdf
[20] *See* https://pubs.usgs.gov/pp/1802/l/pp1802l.pdf
[21] *See id.*
[22] *See id.*
[23] *See* https://core.ac.uk/download/pdf/17355375.pdf
[24] *See* https://geology.com/articles/crushed-stone/
[25] International Iron Metallics Association Fact Sheet: Basic Pig Iron, *available at:* https://www.metallics.org/assets/files/Public-Area/Fact-Sheets/_5_Basic_Pig_Iron_in_EAF_Fact_Sheet_rev3.pdf
[26] International Iron Metallics Association Fact Sheet: Basic Pig Iron, *available at:* https://www.metallics.org/assets/files/Public-Area/Fact-Sheets/_5_Basic_Pig_Iron_in_EAF_Fact_Sheet_rev3.pdf
[27] *See* https://www.reference.com/science/chemical-equation-rusting-iron-80f333525c4d93fa
[28] *See* CDPH Determination on Variance Request from North American Stevedoring, dated January 26, 2018, *available at:*

the chemical composition of rust formed on pig iron. Nonetheless, such rust almost certainly does not contain manganese as the chemical composition of rust formed on steel (an iron alloy with manganese intentionally added) does not contain manganese.[29]

Thus, pig iron does not fit within the stated definition of a "Manganese-Bearing Bulk Material" under the Rules because manganese is not extracted from pig iron nor is pig iron a source of emissions containing manganese. Likewise, CDPH should not interpret its definition of a "Manganese-Bearing Bulk Material" to include pig iron based on its *de minimis* manganese content alone. As noted above, there are various bulk materials that, on information and belief, are not considered a "Manganese-Bearing Bulk Material" such as steel slag and common gravel that have a similar or a higher percentage manganese content as compared to pig iron. If CDPH concurs that pig iron is not a "Manganese-Bearing Bulk Material" under the Rules, SHB withdraws its variance request below in Section III, which it has submitted out of an abundance of caution.

III. RULES FROM WHICH A VARIANCE IS REQUESTED

Out of an abundance of caution, SHB respectfully requests a variance with respect to Section 5.0 of the Rules for pig iron. In accordance with Section 10.0 of the Rules, SHB meets the requirements for a variance application as follows:

A. Request for Variance from Section 5.0 Enclosure of Manganese-Bearing Bulk Material for Pig Iron

1. *A Statement Identifying the Regulation or Requirement from which the Variance is Requested*

SHB requests a variance from Section 5.0(1)-(3) of the Rules for pig iron that is handled and stored at the Facility.[30] Section 5.0(1)-(3) of the Rules contains enclosure requirements for facility operations consisting of all piles, conveyors, transfer points, and processing areas for all Non-Packaged Manganese-Bearing Bulk Materials.

As discussed above in Section II, SHB does not believe that pig iron falls under the definition of a Manganese-Bearing Bulk Material. However, in its January 25, 2019 response to comments on the Rules, CDPH stated that "if a company believes its material contains a level of

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https://www.chicago.gov/content/dam/city/depts/cdph/environmental_health_and_food/CDPHDetVarReq_NASteve doring_1262018.pdf.

[29] *See* M. Islam, W. McGaulley, M. Evans, Analytical Characterization of Flash Rust Formed on Carbon Steel after UHP Waterjetting (noting that the results of the EDS analyses showed that the predominant elements detected on all samples were Fe and O and that trace amounts of Al, S and Si were also detected), *available at:* https://pdfs.semanticscholar.org/dc0d/efa43e6f56655e229b4c477aee0fbb11fe52.pdf

[30] SHB has not and is ***not*** seeking a variance for pig iron as classification as a Bulk Solid Material under the Rules and continues to store and handle pig iron in compliance with Section 3.0 and 7.0 of the Rules and its CDPH-approved Fugitive Dust Plan.

manganese that is so low as to be negligible, whether the manganese content is 1% or 4%, the company may apply for a variance and submit supporting documentation that persuasively demonstrates why there should be an exemption." *See* City of Chicago, Department of Public Health, Official Response to Public Comments on Proposed Amendments to Rules, For the Handling and Storage of Bulk Material Piles, dated January 25, 2019, at p. 4. Accordingly, in accordance with CDPH's statement and out of an abundance of caution, SHB requests a variance from Section 5.0(1)-(3) of the Rules for pig iron.

2. *A Description of the Process or Activity for which the Variance is Requested including Pertinent Data on Location, Size, and the Population and Geographic Area Affected by, or Potentially Affected by, the Process or Activity*

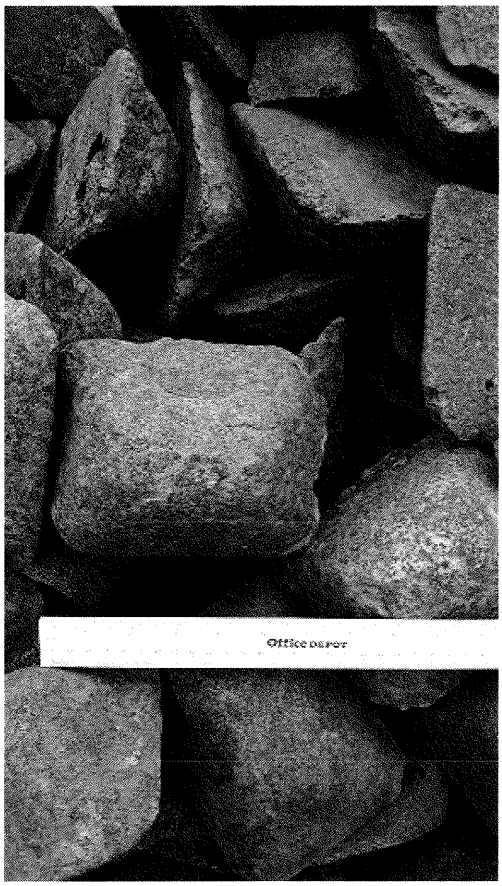
Attached hereto as Exhibit D is a Facility Diagram, from SHB's CDPH-approved Fugitive Dust Plan, which identifies the specific location of all processes and activities at the Facility. Exhibit D also identifies the typical outdoor bulk storage pile locations where pig iron may be stored. At the Facility, pig iron is typically received by barge and then shipped to end users (either steel mills or foundries), at SHB's customers' direction, by truck and occasionally rail (called transloading). SHB also conducts very limited sorting of pig iron through a box screen prior to shipment to end users. SHB seeks this variance to continue to stage/store pig iron in these outdoor bulk storage pile locations prior to shipment to end users and from the enclosure requirements for the box screening and transfer points for receipt and shipments of pig iron by barge, truck, and rail. The transfer points for receipt and shipment of pig iron, box screening, and the staging/storage of pig iron in outdoor bulk storage pile locations are and have been in compliance with the Facility's CDPH-approved Fugitive Dust Plan.

No population or geographic area would be affected by a grant of this variance request as SHB is only seeking to continue its current practices in handling pig iron as a Bulk Solid Material in compliance with the Facility's CDPH-approved Fugitive Dust Plan. Further, as discussed above in Sections I.B and I.C above, over two years of both hourly PM_{10} and filter-based metals, including manganese, fence line monitoring data from the Facility demonstrates that there is no risk to surrounding areas.

Nonetheless, in further response, based on the 2010 Census, the total population surrounding the Facility is 19,988. Additional demographic information is provided in U.S. EPA's ECHO report for the Facility provided at Exhibit E. The area features robust commerce to which S.H. Bell is a vital contributor.

3. *The quantity and types of materials used in the process or activity in connection with which the variance is requested, as appropriate*

The only type of material that SHB is seeking a variance for with respect to Section 5.0(1)-(3) of the Rules is pig iron. The pig iron at the Facility consists of large ingots that weigh upwards of 10 lbs and typically have a diameter greater than 4 inches (the dimensions vary from producer to producer). The following is a picture of the typical pig iron at the Facility:



Additional information regarding pig iron is provided above in Section II. As stated in the Facility's CDPH-approved Fugitive Dust Plan, the outside bulk material storage capacity is 139,000 tons. However, the maximum pig iron storage at any one time at the Facility represents a smaller fraction (typically less than 10%) of that total capacity. The very limited sorting of pig iron through a box screen that occurs at the Facility is also a small fraction (typically around 6% or less) of the total amount of pig iron transloaded through the Facility.

If CDPH needs and requests the specific quantities of pig iron stored, transloaded, and box screened at the Facility in order to evaluate this variance request, SHB would be happy to provide this information under a separate submittal as it constitutes proprietary and confidential commercial or financial information that is exempt from public disclosure under Section 7(1)(g) of the Illinois Freedom of Information Act, 5 ILCS 140/1, *et seq*.

4. *A demonstration that issuance of the variance will not create a public nuisance or adversely impact the surrounding area, surrounding environment, or surrounding property uses*

The new Part D, Section 5.0 of the Rules setting forth the enclosure requirements for manganese-bearing bulk materials appear to be designed to specifically address potential fugitive

emissions containing manganese from bulk material handling operations. Granting a variance to SHB from new Part D, Section 5.0 of the Rules for pig iron will not create a public nuisance or adversely impact the surrounding area, surrounding environment or surrounding property uses in terms of fugitive emissions containing manganese.

First, as discussed in detail in Section II above, pig iron is not a source of fugitive emissions containing manganese. SHB incorporates that discussion by reference as part of the demonstration under this section. In sum, due to the large size, density, and nature of the pig iron ingots, the only potential known fugitive emissions from pig iron are of iron oxides from rust that can scale off when working a pile if it is not properly managed through appropriate fugitive dust controls. As detailed in the CDPH-approved Fugitive Dust Plan, the Facility appropriately controls for potential fugitive dust from pig iron through wetting the material and other methods. Regardless, any potential fugitive dust resulting from pig iron does not contain manganese and thus, granting a variance for this material cannot "create" a public nuisance or adverse impacts from manganese.

Second, to reemphasize, SHB has not and is not seeking a variance for pig iron from classification as a Bulk Solid Material under the Rules and continues to store and handle pig iron in compliance with its CDPH-approved Fugitive Dust Plan. Thus, this variance request only seeks to preserve the existing status quo in allowing SHB to continue to store pig iron outdoors and to continue with its CDPH-approved current fugitive controls for pig iron at the Facility. The air monitoring data collected by SHB demonstrates that under the status quo at the Facility that there are no adverse impacts from manganese or PM_{10} to the surrounding areas. As discussed in detail above in Section I.C (which is incorporated by reference as part of the demonstration for this section) this air monitoring demonstrates that there is no risk to the community or public health based on U.S. EPA risk assessment procedures. An analysis of over two years of hourly PM_{10} monitoring data shows that PM_{10} associated with the Facility are below the standards designed to provide public health protection. *See* Exhibit A; *see also* Section I.B *supra*, which is incorporated by reference as part of the demonstration for this section. Additionally, the PM_{10} Reportable Action Level ("RAL"), as approved in the CDPH-approved Fugitive Dust Plan, has never been exceeded. *Id.* Accordingly, the dust control measures that the Facility follows under its CDPH-approved Fugitive Dust Plan for pig iron are effective based on an analysis of over two years of collected air monitoring data. Thus, in granting this variance and allowing the Facility to continue with its current CDPH-approved dust control measures for pig iron will not create a public nuisance or adversely impact the surrounding areas.

Further, the manganese air monitoring demonstrates that the additional fugitive controls implemented at the Facility for Affected Materials during the late summer/fall of 2017 resulted in a further improvement of the manganese data. The 3-month rolling averages since August 2017 have been less than half of CDPH's new Manganese Limit in Section 6.0(h) of the Rules set at 0.3 $\mu g/m^3$ as a 3-month rolling average. *See* Exhibit A; *see also* Section I.B *supra*, which is incorporated by reference as part of the demonstration for this section. While SHB does not agree or concede that an exceedance of the CDPH Manganese Limit can or does show a potential adverse impact or public nuisance from manganese, certainly the fact that the 3-month rolling average of

the manganese monitoring data has remained at less than half of the Manganese Limit for over 17 consecutive months demonstrates the absence of an adverse impact or public nuisance according to CDPH's own reasoning in setting the limit. *See* CDPH Response to Comments, at p. 12 ("This approach will help prevent problems before they occur or allow the City to make a timely referral to the U.S. EPA for action."). Accordingly, allowing the status quo to continue for pig iron through granting this variance request will not "create" a public nuisance or adverse impacts from manganese as SHB's manganese air monitoring demonstrates conclusively demonstrates that there are no adverse impacts from manganese emissions to the surrounding areas even using CDPH's own Manganese Limit.

5. *A Statement Explaining (i) why compliance with the regulations imposes an arbitrary or unreasonable hardship; (ii) why compliance cannot be accomplished during the required timeframe due to events beyond the Facility Owner or Operator's control such as permitting delays or natural disasters; or (iii) why the proposed alternative measure is preferable*

Compliance with the new manganese-bearing bulk material enclosure requirements in Part D, Section 5.0 of the Rules for pig iron poses an arbitrary and unreasonable hardship on the Facility. Requiring SHB to ensure that pig iron complies with these new enclosure rules, which, logically, were enacted to address fugitive emissions containing manganese, is completely arbitrary because: (1) pig iron is not a source of fugitive emissions containing manganese; and (2) there are bulk materials containing higher or similar manganese percentages as compared to pig iron that to SHB's knowledge are not considered to be a "Manganese-Bearing Bulk Material" under the Rules such as limestone, trap rock, or granitic rocks. *See* Section II *supra*.

Limestone, trap rock (*e.g.,* basalt), and granitic rocks are the three most common types of rocks that are used to make crushed stone (commonly called aggregate or gravel).[31] It is common knowledge that crushed stone/gravel can be very dusty especially when disturbed. Limestone, of course, is also the essential component of concrete (Portland cement). There are undoubtedly numerous facilities in Chicago storing large quantities of crushed stone, which are not being required to comply with the new manganese-bearing bulk material enclosure requirements in Part D, Section 5.0 of the Rules even though the manganese percentage in the crushed stone is likely greater than that of the pig iron and its common knowledge that crushed stone can be a very dusty material. Accordingly, complying with these rules for pig iron places an arbitrary hardship on SHB when bulk materials with higher (or at a minimum, the same) manganese content (all of which is *de minimis*) and are known to be dusty are not subject to such regulation in Chicago.

Compliance with the new manganese-bearing bulk material enclosure requirements in Part D, Section 5.0 of the Rules for pig iron also poses an unreasonable hardship on the Facility. In order to comply for pig iron, SHB would have to spend approximately $2.1 million in capital costs to build a new 27,000 sq. ft. building and to purchase a new dust collector as SHB does not have enough indoor storage capacity for pig iron. This is an unreasonable amount of money that

[31] *See* https://geology.com/articles/crushed-stone/

provides no additional benefit to meet the purposes of these new rules since pig iron is not a source of fugitive emissions containing manganese and because this money would be better spent towards the changes that the Facility is making to comply with the new manganese-bearing bulk material enclosure and monitoring requirements in the new Part D of the Rules for Affected Materials such as bulk ferromanganese and silicomanganese handled at the Facility. Accordingly, in addition to being arbitrary, compliance with the new manganese-bearing bulk material enclosure requirements in Part D, Section 5.0 of the Rules for pig iron also poses an unreasonable hardship due to the high capital cost of constructing a new storage building within the existing footprint of the Facility.

6. *A discussion of alternate methods of compliance and of the factors influencing the choice of applying for a variance*

SHB is not aware of any alternate method of complying with the full enclosure requirement for manganese-bearing bulk materials in Part D, Section 5.0 of the Rules. It is SHB's understanding that unless a variance is granted, all Manganese-Bearing Bulk Materials must be stored inside a full enclosure (*i.e.,* a building), which would include pig iron if CDPH does not agree that this material does not meet the definition of a Manganese-Bearing Bulk Material. SHB does not and will not have sufficient indoor storage capacity for its customer's pig iron business and thus, would have to construct a new 27,000 sq. ft. enclosure for the storage of pig iron. Such a new building is an arbitrary and unreasonable expense where pig iron is not a known source of manganese emissions.

Nonetheless, as an alternate compliance measure, SHB requests to store and handle pig iron in compliance with its Amended Fugitive Dust Plan submitted to CDPH today. A copy of the Amended Fugitive Dust Plan submitted to CDPH today under separate cover, is also provided at Exhibit F. The Amended Fugitive Dust Plan is identical to the CDPH-approved Fugitive Dust Plan except that it includes the proposed manganese monitoring filter-based program and revisions demonstrating compliance with the new requirements contained in the Rules, including tarping of intraplant trucks for all bulk materials. The Amended Fugitive Dust Plan (like the CDPH-approved Fugitive Dust Plan) also dictates required watering for pig iron storage piles and provides for ongoing observations for active operations, a daily monitoring and action plan, three times per working shift visual emissions inspections by EPA Method 9 certified personnel, and quarterly EPA Method 9 opacity testing are all which are applicable to pig iron and serve to ensure that opacity is not exceeding 20% and that visible emissions are not crossing the boundary line of the Facility Additionally, the continuous PM_{10} and filter-based metals monitoring at the Facility will ensure that fugitive controls for pig iron such as watering are being appropriately implemented and that measured manganese levels are not causing adverse impacts to the surrounding communities.

7. *A Statement Regarding the Person's Current Status as Related to the Subject Matter of the Variance Request*

SHB is storing and handling pig iron in compliance with Section 3.0 and 7.0 of the Rules as incorporated into its CDPH-approved Fugitive Dust Plan and its Amended Fugitive Dust Plan

provided at Exhibit F. SHB is ***not*** seeking a variance from any of the new Part D requirements for any Affected Materials (as defined in its CDPH-approved Fugitive Dust Plan), including bulk ferromanganese and silicomanganese handled at the Facility, and intends to comply with new Part D requirements for non-packaged Affected Materials at the Facility. SHB is only seeking a variance from the new Part D, Section 5.0 enclosure requirements for pig iron.

IV. CONCLUSION

For all of the foregoing reasons, SHB respectfully requests concurrence that pig iron is not a Manganese-Bearing Bulk Material and if CDPH does not concur, SHB alternatively requests approval of this variance request. Thank you for your careful consideration of this matter which is of great importance to SHB, its customers and its employees. Please do not hesitate to contact us with questions or requests for more information.

Very truly yours,

TAFT STETTINIUS & HOLLISTER LLP

Kim R. Walberg

KRW:pb
Enclosure

cc: Jennifer Hesse, CDPH *(electronic copy only)*
Paul Chepela, S.H. Bell *(electronic copy only)*
Scott Dismukes, Eckert Seamans *(electronic copy only)*
Jessica Sharrow Thompson, Eckert Seamans *(electronic copy only)*

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