



DEPARTMENT OF PUBLIC HEALTH
CITY OF CHICAGO

August 15, 2016

Mara S. Georges
Daley and Georges, Ltd.
20 South Clark St., Suite 400
Chicago, IL 60603

Re: Gulf Sulphur Services, Ltd, LLLP - Petition for Variance

Dear Ms. Georges:

The Chicago Department of Public Health ("CDPH") is in receipt of Gulf Sulphur Services, Ltd, LLLP's ("GSS's") April 23, 2014 letter requesting eight variances from requirements of CDPH's Rules and Regulations for Control of Emissions from the Handling and Storage of Bulk Material Piles ("Bulk Material Regulations") and supplemental materials in support of the variance requests provided by GSS dated April 2, 2015. Pursuant to the Bulk Material Regulations, CDPH accepted written comments on the variance request during a 30-day comment period. The eight variance requests are:

1. Fugitive Dust Monitoring: GSS requested a variance from Section 3.0(4) of the Bulk Material Regulations, which requires the installation, operation, and maintenance of permanent, continuous Federal Equivalent Method (FEM) real-time PM10 monitors around the perimeter of the facility in accordance with specified requirements.
2. Conveyors: GSS requested a variance from Section 3.0(6) of the Bulk Material Regulations, which requires all conveyors to be covered or enclosed in order to reduce or eliminate fugitive dust to the maximum extent practicable.
3. Transfer Points: GSS requested a variance from Section 3.0(7) of the Bulk Material Regulations which requires all material transfer points to a) be totally enclosed; b) be operated with a water spray system; c) be vented to air pollution control equipment; or d) transfer only "moist material" in a manner that minimizes the exposed drop.

4. Transport / Rumble Strips: GSS requested a variance from Section 3.0(8) of the Bulk Material Regulations, which requires the use of a wheel wash station and rumble strips to shake loose material and dust from transport trucks, unless an approved Fugitive Dust Plan specifies other measures to prevent track out.

5. Pile Height Limit: GSS requested a variance from Section 5.0(2) of the Bulk Material Regulations, which requires that outdoor piles be no higher than 30 feet, specifically to allow GSS to maintain outdoor piles up to 42 feet in height.

6. Protection of Waterways: GSS requested a variance from Section 5.0(3) of the Bulk Material Regulations, which requires a 50-foot setback from any waterway.

7. High Wind Events: GSS requested a variance from Section 5.0(4) of the Bulk Material Regulations, which requires that disturbance of outdoor piles be suspended during “high wind conditions.” Pursuant to Section 2.0(12), “high wind conditions” are “when average wind speeds exceed 15 miles per hour over two consecutive five minute intervals of time.”

8. Dust Suppressant System: GSS requested a variance from Section 5.0(5)(b) of the Bulk Material Regulations, which requires facilities to apply chemical stabilizers and/or maintain and operate water spray bars, a misting system, water spray systems and/or water trucks to prevent fugitive dust emissions. Specifically, GSS requested a variance to specify that the application of additional moisture with a fixed suppressant system is not required for sulphur¹ prill that is maintained at a moisture content of at least 2 percent by weight.

DESCRIPTION AND EVALUATION OF PRILLED SULPHUR

Sulphur prills are formed by immersing droplets of molten sulphur into a cold water bath through perforated trays. As the droplets cool, they solidify and form what is referred to as sulphur prill or formed sulfur. The size and shape of each droplet is determined by the size of the hole through which the droplet passes before coming into contact with the cooling bath.

In support of each variance request, GSS cited the “dust resistant” nature of the sulphur prill stored at the facility. GSS noted that “sulphur prill is physically resistant to dust generation because it is formed into pellets of relatively uniform size with a smooth surface.” (April 23, 2014 GSS Variance Petition, p. 5.) Further, the prills are formed in a “wet prill production process,” so that the prills retain moisture rather than any surface residue or dust. (*Id.* p. 3.)

¹ Throughout documents submitted by GSS, the word *sulfur* is sometimes spelled “sulphur” and sometimes “sulfur.” Accordingly, CDPH uses the two spellings interchangeably throughout this letter.

As described in a technical memorandum by GSS's consultant, TRC Companies, Inc. ("TRC"):

The facility receives sulfur in molten form, typically in tank trucks, but occasionally in rail cars. The molten sulfur is unloaded via pump into a storage tank. The molten sulfur is eventually pumped from the storage tank to an enclosed priller structure. The prilling process involves passing the molten sulfur through forming trays (*i.e.*, trays with small holes) which creates droplets of molten sulfur that fall into a water bath. The droplets solidify upon entering the water bath and the resulting sulfur product is referred to as sulfur prill – pelletized, sphere-like aggregate material that is a neater, simpler form for handling, and which results in reduced dust. Emissions from the prilling operation are controlled by a wet gas scrubber. After the prill is cooled and screened to drain water, the pellets are conveyed out of the enclosed priller structure via open-top conveyors to an outdoor storage pile. [April 2, 2015 GSS Additional Information, Exhibit 1-C.]

TRC went on to provide an air quality analysis, referencing the National Ambient Air Quality Standards (NAAQS) for both coarse and fine particulate matter (PM10 and PM2.5, respectively), and concluded that the "Sulfur Prill storage pile is predicted to have a relatively small impact in comparison to the NAAQS."

In addition, GSS provided industry reports which noted that the optimum moisture content of prilled sulfur is 1.5-2%, because this level of moisture suppresses dust due to "water mechanically adhering to the surface" of the prills. (April 2, 2015 GSS Additional Information, p. 5.) According to GSS, higher moisture levels cause problems, such as an increase in "uncontrolled movement in storage and transit." *Id.*

CDPH agrees with GSS that the wet process of forming sulphur prills results in a reduced chance of creating fugitive dust as compared to other materials. In addition, pure sulphur by nature has very little dust, at about 0.1 to 0.5% by weight.² Furthermore, it is relatively heavy compared to coke and coal, with a molecular weight of 32.06 g/mol, a density of 2.1 g/cm³ and relative vapor density of 8.6 (air = 1.0).³ Thus, fugitive emissions from sulphur prill are relatively small compared to coke and coal.⁴

² ClearTech Material Safety Data Sheet on Sulphur

³ Safety Data Sheet, QChem (Qatar Chemical Company Ltd) on Sulfur, prilled

⁴ Sulphur has a flash point of 207°C (405 °F) and auto ignition temperature of 232 °C (450 °F). It is classified as flammable solid and could cause skin and eye irritation. It could decompose to form sulfur oxides, but it is not regulated as a hazardous material or dangerous goods for transportation by both USDOT and IATA.

However, CDPH notes that there is still some potential for dust from prilled sulphur to become airborne or scattered by the wind if not managed properly. Notably, in GSS's Exhibit 1-A, TRC estimated an hourly pile emission rate of 0.24 lb/hr. When extrapolated over a year, that translates to an emission rate of 1.05 Ton/year. Even though this is smaller than the emission rate of other materials, it is nonetheless important for GSS to comply with the Bulk Material Regulations and the variance conditions set forth herein, in order to control and minimize the dust potential that does exist.

SUMMARY OF CDPH VARIANCE DETERMINATIONS

As set forth in greater detail in subsequent sections of this document, following is a summary of CDPH's determinations for each of GSS's variance requests:

1. **Fugitive Dust Monitoring**: With respect to GSS's request regarding installation of dust monitors, CDPH grants the variance request subject to the following condition pursuant to Section 8.0(3)(c): GSS must create and implement a plan, and train employees on the plan, to monitor for visible dust and take appropriate action in the event dust is observed. In summary, the basis for this determination includes, but is not limited to, CDPH's finding that GSS has demonstrated that, due to the unique nature of prilled sulphur, issuance of the variance is not likely to create a public nuisance or adversely impact the surrounding area. Please note, however, that pursuant to Section 8.0(3)(d) of the Bulk Material Regulations, a variance may be revoked at any time if the Commissioner finds that operation of the facility is creating a public nuisance or otherwise adversely impacting the surrounding area, surrounding environment, or surrounding property uses.

2. **Conveyors**: With respect to GSS's request regarding conveyors, CDPH finds that GSS has met the requirements set forth in Sections 8.0(2) and 8.0(3)(a) of the Bulk Material Regulations for issuance of a variance, and the variance request is therefore granted. In summary, the basis for this determination includes, but is not limited to, CDPH's finding that GSS has demonstrated that, due to the unique nature of prilled sulphur, issuance of the variance will not create a public nuisance or adversely impact the surrounding area. Please note, however, that pursuant to Section 8.0(3)(d) of the Bulk Material Regulations, a variance may be revoked at any time if the Commissioner finds that operation of the facility is creating a public nuisance or otherwise adversely impacting the surrounding area, surrounding environment, or surrounding property uses.

3. Transfer Points: With respect to GSS's request regarding transfer points, CDPH finds that GSS has met the requirements set forth in Sections 8.0(2) and 8.0(3)(a) of the Bulk Material Regulations for issuance of a variance, and the variance request is therefore granted. In summary, the basis for this determination includes, but is not limited to, CDPH's finding that GSS has demonstrated that, due to the unique nature of prilled sulphur, issuance of the variance will not create a public nuisance or adversely impact the surrounding area. Please note, however, that pursuant to Section 8.0(3)(d) of the Bulk Material Regulations, a variance may be revoked at any time if the Commissioner finds that operation of the facility is creating a public nuisance or otherwise adversely impacting the surrounding area, surrounding environment, or surrounding property uses.

4. Transport / Rumble Strips: With respect to GSS's request regarding installation of rumble strips and a wheel washing station, CDPH grants the variance request subject to the following condition pursuant to Section 8.0(3)(c): GSS must implement the truck-cleaning procedures set forth in GSS's May 2015 Fugitive Dust Plan.⁵ In addition, please note that, pursuant to Section 8.0(3)(d) of the Bulk Material Regulations, a variance may be revoked at any time if the Commissioner finds that operation of the facility is creating a public nuisance or otherwise adversely impacting the surrounding area, surrounding environment, or surrounding property uses.

5. Pile Height Limit: With respect to GSS's request regarding pile height, CDPH finds that GSS has not met the requirements of Sections 8.0(2) and 8.0(3)(a) of the Bulk Material Regulations, and the variance request is therefore denied. The basis for this determination includes, but is not limited to, CDPH's finding that GSS has not demonstrated that 42-foot high piles will not create a public nuisance or adversely impact the surrounding area. Notably, during the creation of the Bulk Material Regulations, CDPH considered the effects of pile height on dust emissions and concluded that taller pile heights lead to greater dust emissions due to increased surface areas and higher wind speeds.⁶ In addition, pursuant to two of the variances granted herein, GSS will operate without fugitive dust monitors and within the waterway setbacks

⁵ Please note that references to the May 2015 Fugitive Dust Plan in this letter are not intended to mean that CDPH approves the Dust Plan in its entirety. CDPH will respond to the Dust Plan in a separate correspondence.

⁶ The City of Chicago Fugitive Dust Study and CDPH's Responsiveness Document can be found online at www.cityofchicago.org/environmentalrules.

established in the Bulk Material Regulations. Accordingly, all bulk material piles at the facility must be maintained at no more than 30 feet in height within ninety (90) days from the date of this variance determination letter, consistent with the 90-day timeframe set forth in Section 6.0(2) of the Bulk Material Regulations.

6. Protection of Waterways: With respect to GSS's request regarding setbacks from waterways, CDPH grants the variance request, due to the unique nature of prilled sulphur, subject to the following conditions pursuant to Section 8.0(3)(c): 1) GSS must maintain in good condition an engineered containment berm, such as the asphalt berm described in GSS's May 2015 Fugitive Dust Plan, to prevent sulphur prills from falling into the river; and 2) GSS must maintain adequate site drainage and grading to ensure there is no run-off into the river. Please note that pursuant to Section 8.0(3)(d) of the Bulk Material Regulations, a variance may be revoked at any time if the Commissioner finds that operation of the facility is creating a public nuisance or otherwise adversely impacting the surrounding area, surrounding environment, or surrounding property uses.

7. High Wind Events: With respect to GSS's request to define high wind conditions as 30 miles per hour instead of 15 miles per hour, CDPH grants the variance request, due to the unique nature of prilled sulphur, subject to the following conditions pursuant to Section 8.0(3)(c): 1) When wind speeds reach 30 miles per hour, GSS will conduct a visible emissions assessment and take appropriate mitigation measures as described in GSS's May 2015 Fugitive Dust Plan; and 2) Regardless of the wind speed, GSS must cease operations if visible opacity exceeds 10 percent, as set forth in Section 3.0(2)(b) of the Bulk Material Regulations. Please note that pursuant to Section 8.0(3)(d) of the Bulk Material Regulations, a variance may be revoked at any time if the Commissioner finds that operation of the facility is creating a public nuisance or otherwise adversely impacting the surrounding area, surrounding environment, or surrounding property uses.

8. Dust Suppressant System: With respect to GSS's request regarding the application of dust suppressants, CDPH grants GSS's variance request, due to the unique nature of prilled sulphur, subject to the following conditions pursuant to Section 8.0(3)(c): 1) GSS must apply dust suppressants to the exposed pad on a semi-annual basis as described in GSS's May 2015 Fugitive Dust Plan; and 2) GSS must cease operations if visible opacity exceeds 10 percent, as set forth in Section 3.0(2)(b) of the Bulk Material Regulations. Please note that pursuant to

Section 8.0(3)(d) of the Bulk Material Regulations, a variance may be revoked at any time if the Commissioner finds that operation of the facility is creating a public nuisance or otherwise adversely impacting the surrounding area, surrounding environment, or surrounding property uses.

DETAILED DISCUSSION

I. Requirements for Issuance of a Variance

Under Section 8.0 of the Bulk Material Regulations, the burden of proof is upon the applicant for the variance to demonstrate that issuance of the requested variance will not create a public nuisance or adversely impact the surrounding area, the surrounding environment, or surrounding property uses. In the event that the applicant does not meet this burden, the variance request will be denied. Pursuant to Section 8.0(2), a variance request must be in writing and must set forth, in detail, all of the following (in pertinent part):⁷

- a) A statement identifying the regulation or requirement from which the variance is requested;
- b) 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;
- c) The quantity and types of materials used in the process or activity in connection with which the variance is requested, as appropriate;
- d) 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;
- e) A statement explaining:
 - i. Why compliance with the regulations imposes an arbitrary or unreasonable hardship;

⁷ Because the variance requests under review do not involve a request for an extension of time for full enclosure, requirement 8.0(2)(i) is not relevant to this discussion, and is therefore omitted.

- 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.
- f) A description of the proposed methods to achieve compliance with the regulations and a timetable for achieving that compliance, if applicable;
- g) A discussion of alternate methods of compliance and of the factors influencing the choice of applying for a variance;
- h) A statement regarding the person's current status as related to the subject matter of the variance request[.]

In addition, Section 8.0(3) of the Bulk Material Regulations sets forth the criteria for reviewing applications:

- a) In determining whether to grant a variance, the Commissioner [of CDPH] will consider public comments received pursuant to 8.0(4) and will evaluate the information provided in the application to meet the requirements of 8.0(2). Particular consideration will be given to the following information:
 - i. Inclusion of a definite compliance program;
 - ii. Evaluation of all reasonable alternatives for compliance;
 - iii. Demonstration that any adverse impacts will be minimal.
- b) The Commissioner may deny the variance if the application for the variance is incomplete or if the application is outside the scope of relief provided by variances.
- c) The Commissioner may grant a variance in whole or in part, and may attach reasonable conditions to the variance to ensure minimization of any adverse impacts.
- d) Issuance of a variance is at the sole discretion of the Commissioner. A variance may be revoked at any time if the Commissioner finds that operation of the Facility is creating a public nuisance or otherwise adversely impacting the surrounding area, surrounding environment, or surrounding property uses.

II. Variance Process and Public Comments

In addition to the requirement that the Commissioner of CDPH (“Commissioner”) consider public comments, as set forth in Section 8.0(3)(a) of the Bulk Material Regulations, Section 8.0(5) also provides that the Commissioner will not grant any variance until members of the public have had an opportunity to submit written comments on the variance application. This section further provides that public notice will be provided by publication in a newspaper of general circulation published within the City and by publication on the City’s website, and that the Commissioner will accept written comments for a period of not less than thirty (30) days from the date of the notice.

On May 2, 2014, public notice of GSS’s variance request was provided by publication in the Chicago Sun-Times and on the City’s website at www.cityofchicago.org/environmentalrules. This notice stated that, to be considered, written comments must be received by CDPH on or before June 2, 2014. During the public comment period, CDPH received two written submissions from the public, both of which are posted on the website referenced above.

The first letter, dated May 30, 2014, was submitted on behalf of the Southeast Side Coalition to Ban Petcoke (the “Coalition”). This letter noted that the Coalition fundamentally opposes the variance process and urged CDPH to deny the variance request from GSS. The letter also stated that GSS did not provide data on the affected population and geographic area as required by the Bulk Material Regulations; did not demonstrate that issuance of the variance will not create a public nuisance or adverse impact; and did not provide evidence to support GSS’s assertion that prilled sulfur creates less dust than other materials covered by the regulations. The letter further noted that GSS was unclear as to “how much particulate matter it will emit and what effect these emissions will have on the community.” In addition, the Coalition stated that GSS did not prove that the Bulk Material Regulations impose “an arbitrary or unreasonable hardship.”

The other opposition letter, dated June 2, 2014, was submitted jointly by the Natural Resources Defense Council (“NRDC”) and the Southeast Environmental Task Force (“SETF”) (hereafter collectively referred to as “NRDC and SETF”). This letter noted that GSS did not provide any studies, data, or background calculations regarding the dust from prilled sulphur, including how emissions are affected by windspeed and how emissions differ between a moisture level of 2% and 3%. They stated that GSS didn’t address whether or not its product

breaks down from handling or whether there is a risk of spillage and crushing from heavy vehicles or machinery. NRDC and SETF also noted the variance request did not include maps, site configurations, or description of operations. They further noted that the application did not include any cost information, any documentation regarding Envirobond, or any information on the site's capacity to support a need for a 42-foot high pile. NRDC and SETF also mentioned that a review of Google Maps showed track out from the sulphur pile.⁸

In response to CDPH's request for more information, and in response to the public comments, GSS submitted additional information on April 2, 2015. This information is also posted on the above-referenced website.

III. Variance Requests and Determinations Detailed Analysis

1. Fugitive Dust Monitoring.

A. Detailed Fugitive Dust Monitoring Variance Request: GSS requested a variance from Section 3.0(4) of the Bulk Material Regulations, which requires installation and operation of permanent, continuous Federal Equivalent Method (FEM) real-time PM10 monitors around the perimeter of all bulk material facilities. GSS stated that the cost of such installation and operation "creates an arbitrary hardship because it does not take into account the nature of sulphur prill, which generates very little fugitive dust." (April 23, 2014 GSS Variance Petition, p. 4.) In a subsequent submission, GSS provided a technical memorandum from its consultant, TRC, which included the results of air quality modeling to support GSS's assertion that prilled sulphur has a substantially lower emission rate than other regulated materials. (April 2, 2015 GSS Additional Information, Exhibit 1-A.) GSS also provided more information about its location, its processes, and its product and noted that "material handling at the site is typically minimal" with "no screening, sorting, crushing, or blending of stockpiled prill." (April 2, 2015 GSS Additional Information, p. 2.)

B. Analysis of Variance Request:

i. Minimization of Adverse Impacts. Section 8.0(2)(d) of the Bulk Material Regulations requires a demonstration that issuance of the variance will not create a public

⁸ The comment letter did not include a copy of the referenced Google Map, and CDPH was not able to find any aerial map that showed any track-out from the GSS site.

nuisance or adversely impact the surrounding area, environment, or property uses. Throughout the variance application and in the supplemental materials, GSS explained the unique attributes of prilled sulphur, particularly with regard to the prilling process utilized at the GSS Facility. As explained in the “Description and Evaluation Of Prilled Sulphur” above, industry reports submitted with GSS’s additional information described the optimum moisture content of prilled sulfur as being 1.5-2%, because this level of moisture suppresses dust, while higher moisture levels cause problems, such as an increase in “uncontrolled movement in storage and transit.” (April 2, 2015 GSS Additional Information, p. 5.) Thus, if dust is already suppressed by the level of moisture inherent in the prill forming process, installation of permanent air monitors “would be unnecessary and ineffective to achieve a goal already met by the Site.” (April 23, 2014 GSS Variance Request, p. 4.)

In addition, GSS noted that the facility “is located within an industrial area that is over half a mile away from residential areas,” and that GSS has not received any complaints about the facility. (April 2, 2015 GSS Additional Information, p. 2.)

ii. Alternative Compliance Program. In the variance request materials, GSS did not propose an alternative to installation of air monitors. Instead, the request was based mainly on GSS’s assertion that its product generates very little fugitive dust, thus rendering air monitors unnecessary. However, in addition to the installation of perimeter air monitors, the Bulk Material Regulations require operators to “schedule and plan for quarterly testing to ensure compliance with the prohibition on Fugitive Dust set forth in 3.0(2).” (Section 3.0(f)(ii) of the Bulk Material Regulations.) Section 3.0(2)(a) prohibits visible dust from migrating beyond the property line of a facility; and Section 3.0(2)(b) provides that the opacity of any dust within the property line shall not exceed 10%. In this regard, the Bulk Material Regulations require implementation of a Fugitive Dust Plan that must include a dust monitoring plan. In response to this requirement, GSS’s May 2015 Fugitive Dust Plan referenced State opacity regulations and included an inspection form for outdoor inspections of fugitive or smoke emissions.

C. CDPH Determination: Due to the unique qualities of prilled sulphur as described above, CDPH conditionally grants the variance with regard to the installation of permanent air monitors. In the absence of air monitors, GSS must ensure that personnel on site are trained 1) to

observe for visible dust in accordance with the visible monitoring protocol as set forth in the Fugitive Dust Plan and as required by Section 3.0(2)(d) of the Bulk Material Regulations described; 2) to take responsive action as described in the Fugitive Dust Plan if visible dust is observed in violation of the Bulk Material Regulations—i.e. above 10% opacity on site and at any opacity crossing over the property line; and 3) to document all such observations and response activities. As mentioned above, CDPH will respond separately to GSS’s May 2015 Fugitive Dust Plan. However, future versions of the facility’s Fugitive Dust Plan must include a detailed plan for compliance with the conditions of this variance.

2. Conveyors.

A. Detailed Conveyor Variance Request: GSS requests CDPH to grant a variance from Sections 3.0(6) and 6.0(3) of the Bulk Material Regulations to allow GSS not to cover or enclose the facility’s conveyors. As described in the variance request, GSS’s conveyors include:

- One 60-foot-long intermodal container loading conveyor
- Four 51-foot-long portable conveyors
- One approx. 92-foot to 130-foot-long radial telestacking conveyor used for prilling operations
- One approx. 98-foot-long to 150 foot-long telestacking conveyor used for barge and railcar loading [April 23, 2014 GSS Variance Petition, p. 3-4.]

GSS stated that the conveyors were not required to be enclosed or covered when permits were issued by the Illinois Environmental Protection Agency and the City in 2012, and that the cost to cover the conveyors (more than \$125,000 at the outset and approximately \$5,000 per year for maintenance thereafter) would create “an unreasonable hardship in light of the fact that covered or enclosed conveyors would target a problem that does not exist at the Site due to the high moisture content of the sulphur prill.” (April 23, 2014 GSS Variance Petition, p. 4.)

B. Analysis of Variance Request:

i. Minimization of Adverse Impacts. Section 8.0(2)(d) of the Bulk Material Regulations requires a demonstration that issuance of the variance will not create a public nuisance or adversely impact the surrounding area, environment, or property uses. As mentioned

above, GSS provided information to support its description of the unique attributes of prilled sulphur. Specifically, GSS provided documentation explaining that the prilling process results in a product with an optimum level of moisture for dust suppression, and that the size, shape, and composition of the prills do not tend to produce dust. (April 2, 2015 GSS Additional Information.) Accordingly, sulphur prills travelling along open conveyors should not generate fugitive dust. GSS also noted that the closest residential areas are more than half a mile from the facility. *Id.*

ii. Alternative Compliance Program. In the variance request materials, GSS did not propose an alternative to covered or enclosed conveyors. Instead, the request was based mainly on GSS's assertion that sulphur prills have the capability to generate very little fugitive dust as described above, thus rendering conveyor covers unnecessary. However, GSS's May 2015 Fugitive Dust Plan sets forth dust control measures for conveyors and transfer points. In addition to noting the "high moisture content" of the sulphur prills, the plan outlines the following additional dust control measures:

- "As necessary, a dust suppressant may be used to the extent that its use does not increase the moisture content of the product beyond contractual limits or compromise the integrity of the product."
- "The elevation from which sulfur prill is deposited onto conveyors and telestackers, and into feed bins, trucks (intermodal containers), rail cars, and barges is reduced to the extent practicable."
- "The number of transfer points is kept to a minimum given the plant configuration and design." [May 2015 Fugitive Dust Plan, Table 1.]

C. CDPH Determination: Based on the unique qualities of prilled sulphur as described above, and in consideration of the measures outlined in GSS's Fugitive Dust Plan, as well as the conditions imposed on other variances granted herein, CDPH finds that issuance of the variance with regard to the conveyors is not likely to create a public nuisance or adversely impact the surrounding area. Accordingly, CDPH grants the variance request.

3. Transfer Points.

A. Detailed Transfer Points Variance Request: Pursuant to Section 2.0(21) of the Bulk Material Regulations, a “transfer point” is “the location at or within a facility where material being moved, carried, or conveyed is dropped or deposited.” Under Section 3.0(7) of Regulations, all transfer points must either be conducted 1) within an enclosure, 2) under a water spray system, 3) in conjunction with vented air pollution control equipment, or 4) using only “moist material” that is handled in a manner that minimizes the exposed drop. Focusing on the fourth option, GSS stated that its product, with a 1.5%-2% moisture level, is sufficiently moist to control dust. However, under the Bulk Material Regulations, “moist material” is defined as “material with a moisture content of 3% by weight as determined by ASTM analysis, unless another standard is established by an applicable State Permit, Law, Rule or Regulation.”

As described above, GSS provided industry publications explaining the optimum level of moisture for sulfur prills. Further, the operations and maintenance manual for the sulphur forming unit at the GSS facility states that “It is important that our formed product is produced with up to 2.0% water mechanically adhering to the surface.” (April 2, 2015 GSS Additional Information, p. 5.) Finally, GSS posited that the absence of any State-mandated moisture standard “is due to the safety properties of sulphur prill and constitutes a *de facto* regulatory finding that regulation of the moisture content of sulphur prill is unnecessary.”

Thus, GSS requested a variance to allow it to transfer “moist material” using a moisture level of 2% rather than 3%.

B. Analysis of Variance Request:

i. Minimization of Adverse Impacts. Section 8.0(2)(d) of the Bulk Material Regulations requires a demonstration that issuance of the variance will not create a public nuisance or adversely impact the surrounding area, environment, or property uses. As described above, GSS provided information to support its description of the unique attributes of prilled sulphur, including documentation to show that the prilling process results in a product with an optimum level of moisture for dust suppression, and that the size, shape, and composition of the prills do not tend to produce dust. (April 2, 2015 GSS Additional Information.) Accordingly, the transfer of sulphur prills with a moisture content of 2% should not produce fugitive dust. GSS also noted that the closest residential areas are more than half a mile from the facility. *Id.*

ii. Alternative Compliance Program. In the variance request materials, GSS asserted that the transfer of materials with a 2% moisture content, instead of 3%, will adequately control dust. In addition, in conjunction with the dust control measure for the conveyors, GSS's May 2015 Fugitive Dust Plan indicated that the following additional dust control measures would be applied to transfer points:

- "As necessary, a dust suppressant may be used to the extent that its use does not increase the moisture content of the product beyond contractual limits or compromise the integrity of the product."
- "The elevation from which sulfur prill is deposited onto conveyors and telestackers, and into feed bins, trucks (intermodal containers), rail cars, and barges is reduced to the extent practicable."
- "The number of transfer points is kept to a minimum given the plant configuration and design." [May 2015 Fugitive Dust Plan, Table 1.]

C. CDPH Determination: Based on the unique qualities of prilled sulphur as described above, and in consideration of the measures outlined in GSS's Fugitive Dust Plan, as well as the conditions imposed on other variances granted herein, CDPH finds that issuance of the variance with regard to transfer points is not likely to create a public nuisance or adversely impact the surrounding area. Accordingly, CDPH grants the variance request.

4. Transport / Rumble Strips.

A. Detailed Transport/Rumble Strips Variance Request: GSS requested a variance from Section 3.0(8)(d) of the Bulk Material Regulations which requires the use of a wheel wash station and rumble strips to shake loose material and dust from transport trucks, unless an approved Fugitive Dust Plan specifies other measures to prevent track out. GSS stated that the facility "lacks space to incorporate rumble strips, and as such incurs manual labor costs to sweep the trucks before leaving the facility." (April 23, 2014 GSS Variance Petition, p. 5.) As described in the variance request, prilled sulphur is transferred into intermodal containers on approximately sixteen trucks per month, and these trucks "are swept clean of any loose materials

and then driven through a wheel washing bath prior to exiting the storage area and exiting the Site.” *Id.*

Thus, while GSS’s Fugitive Dust Plan includes truck cleaning measures, including the use of paved roads, truck sweeping, and use of a wheel washing bath, GSS requested “a temporary variation pending approval of the Fugitive Dust Plan.” (April 2, 2015 GSS Additional Information, p. 6.)

B. Analysis of Variance Request:

i. Minimization of Adverse Impacts. Section 8.0(2)(d) of the Bulk Material Regulations requires a demonstration that issuance of the variance will not create a public nuisance or adversely impact the surrounding area, environment, or property uses. With regard to outgoing transport trucks, GSS noted that, since sulphur prill “generates almost no or very little fugitive dust,” as previously explained, “the tractors, trailers, and wheels of GSS’ trucks at the Site are not covered in sulphur dust or residue when leaving or returning to the Site.” (April 23, 2014 GSS Variance Petition, p. 5.)

ii. Alternative Compliance Program. Rather than install rumble strips, GSS proposes to continue its practice of sweeping outgoing trucks and having the trucks drive through a “wheel washing bath” to prevent track-out from the facility. Specifically, Table 1 in GSS’s May 2015 Fugitive Dust Plan provides that any dust from vehicles is controlled through the following measures:

- Vehicles are required to adhere to a posted speed limit within the facility of no more than 8 miles per hour.
- Vehicles are driven only on paved roads within a quarter mile of the perimeter of the facility and within the City of Chicago. Moreover, facility roadways and parking areas are paved up to the entrance to the sulfur prill storage area.
- Sulfur prill transport trucks are cleaned (e.g., as by sweeping) to remove loose material (i.e., sulfur prill) that is collected for reuse.

- Trucks pass through a passive wheel wash station to remove residual material from vehicles entering and leaving the vatted sulfur prill storage area.

C. CDPH Determination: As stated in the Bulk Material Regulations, rumble strips are required “to vibrate the trucks and shake off loose material and dust, unless the approved Fugitive Dust Plan specifies other measures to ensure the trucks will not cause any track-out of materials onto the public way.” (Bulk Material Regulations, Section 3.0(8)(d)). Based on the unique qualities of prilled sulphur as described above, and in consideration of the measures outlined in GSS’s Fugitive Dust Plan, as well as the conditions imposed on other variances granted herein, CDPH finds that issuance of the variance with regard to installation of rumble strips is not likely to create a public nuisance or adversely impact the surrounding area. Accordingly, CDPH grants the variance request.

5. Pile Height.

A. Detailed Pile Height Variance Request: GSS requested CDPH to grant a variance from Section 5.0(2) of the Bulk Material Regulations, which requires that outdoor piles be no higher than 30 feet, specifically to allow GSS to maintain outdoor piles up to 42 feet high. GSS stated that its State permit allows a pile height of 42 feet and that the site was “specifically designed, engineered, and permitted to store sulphur prill (at a height of up to 42 feet) safely, efficiently, and in compliance with commercial objectives.” (April 23, 2014 GSS Variance Petition, p. 6.) GSS further stated that “due to the size, surface makeup, and weight, sulphur prills cannot ‘escape’ from a properly designed and operated stockpile.” *Id.* In the additional information submitted in support of the request, GSS noted that its consultant, TRC, had based its emissions modeling conclusions on a pile height of 42 feet. (April 2, 2015 GSS Additional Information, p. 7.) GSS also noted that sulphur prill has a higher density than other bulk materials, with a density of 2.06 g/cm³. *Id.*

B. Analysis of Variance Request:

i. Minimization of Adverse Impacts. Section 8.0(2)(d) of the Bulk Material Regulations requires a demonstration that issuance of the variance will not create a public nuisance or adversely impact the surrounding area, environment, or property uses. With regard to pile height, GSS relied mainly upon prior facility approvals and the nature of prilled sulphur to

justify an increased pile height and did not provide any plans for minimizing potential adverse impacts. However, the approvals referenced by GSS did not include any specific discussion of a 42-foot high pile. Notably, CDPH's Air Pollution Control Permit and Certificate of Operation programs do not include a review of pile heights. In addition, the State's approval of the facility's registration under the Illinois Environmental Protection Agency's (IEPA's) Registration of Smaller Sources (ROSS) Program is an acknowledgement that the facility falls within the limitations for ROSS eligibility, rather than an approval of a particular pile height at the facility.

Moreover, while CDPH agrees that prilled sulphur produces less dust emissions than other materials, as discussed above, sulphur prills are still capable of producing some dust. When it comes to dust emissions, pile height is relevant. The Bulk Material Regulations capped pile heights at 30 feet (consistent with the height limit for reprocessed construction and demolition material pursuant to Section 11-4-2000(D) of the Chicago Municipal Code) based on CDPH's conclusion that taller pile heights lead to greater dust emissions. (*See* CDPH Official Response to Public Comments on the Proposed Rules and Regulations for the Handling and Storage of Bulk Material Piles, March 13, 2014.)⁹ Thus, CDPH cannot approve any greater height without a clear demonstration that doing so will not adversely impact the surrounding area, environment, or property uses.

ii. Alternative Compliance Program. Section 8.0(2)(g) of the Bulk Material Regulations requires variance requests to include "a discussion of alternate methods of compliance." However, GSS did not include any discussion of an alternative compliance program to address the difference in fugitive dust emissions that would occur with a 42-foot high pile. Notably, in the variance request, GSS mentioned that the pile height will typically be lower than 42 feet. (April 23, 2014 GSS Variance Petition, p. 6.) In a recent inspection, CDPH confirmed that the prilled sulphur pile was approximately 25 feet high. In fact, in past inspections, CDPH has always observed the pile to be below 30 feet. Thus the facility's current fugitive dust program is applied to a pile that is not more than 30 feet high. Without an alternate compliance program, it is not clear that a higher pile will not adversely affect the surrounding community.

In addition, it is important to note that GSS has been granted several variances herein. In particular, there are two that depend upon GSS's compliance with the thirty-foot height limit: 1) the variance that will allow GSS to maintain its prilled sulphur pile closer to the Calumet River than the 50-foot setbacks established in the Bulk Material Regulations, and 2) the variance that will allow GSS to operate without fugitive dust monitors.

C. CDPH Determination: For the reasons set forth above, CDPH finds that GSS has not met the requirements of Sections 8.0(2) and 8.0(3)(a) of the Bulk Material Regulations for issuance of a variance allowing GSS to maintain bulk material piles up to 42 feet, and the variance request is therefore denied. The basis for this determination includes, but is not limited to, CDPH's finding that GSS has not demonstrated that a 42-foot high pile will not create a public nuisance or adversely impact the surrounding area and has not provided an alternative method to ensure compliance, especially in light of the other variances granted herein.

Accordingly, any bulk material piles at the facility that are above 30 feet in height must be reduced to no more than 30 feet within ninety (90) days from the date of this variance determination letter, consistent with the 90-day timeframe set forth in Section 6.0(2) of the Bulk Material Regulations.

6. Protection of Waterways.

A. Detailed Waterways Variance Request: GSS requested a variance from Section 5.0(3) of the Bulk Material Regulations, which requires outdoor storage piles to be set back at least 50 feet from any waterway, except during the process of loading and unloading barges "for a period of time not to exceed 24 hours so long as no materials will fall, erode, be thrown, discharged, dumped, disposed of, or deposited in the waterway at any time." GSS's request was limited to the southwest corner of the sulphur prill stockpile, where GSS would like to maintain the setbacks from the Calumet River as approved in Planned Development Ordinance ("PD") No. 1178. PD 1178 requires a setback consisting of at least twenty feet: ten feet of roadway plus 10 feet of landscaped area, as well as a 2-foot wide by 1-foot high asphalt containment berm. (See April 2, 2015 GSS Additional Information, Exhibit 2-D, pages 109981 and 109984.)

B. Analysis of Variance Request:

i. Minimization of Adverse Impacts. Section 8.0(2)(d) of the Bulk Material Regulations requires a demonstration that issuance of the variance will not create a public nuisance or adversely impact the surrounding area, environment, or property uses. GSS noted that “during periods when the storage capacity of our piles is at average levels (or approximately 10,000 tons), there will be no material within 50 feet of the river; however, GSS needs to preserve the Site’s maximum capacity in order to make the Site economically viable.” (April 23, 2014 GSS Variance Petition, p. 6.) GSS further reiterated the point that the sulphur pellets generate very little fugitive dust because they are “too large, heavy and solid,” and that, due to their size, weight and density, they are not likely to be blown from the storage piles. In addition, GSS stated that: “The site has been structured to minimize the likelihood that prilled sulphur will reach the river, including, for example, GSS’ construction of a containment berm around the storage area.” *Id.* GSS also cited a report finding that “the ‘scientific literature and readily available data on the toxicological properties of sulphur support a conclusion that the material is not harmful to the marine environment.’” (April 2, 2015 GSS Additional Information, p. 8.)

ii. Alternative Compliance Program. In lieu of the 50-foot setback, GSS proposes to maintain portions of the sulphur prill pile behind an engineered asphalt containment berm designed in consultation with R&M Engineering Consultants, as well as landscaping approved by the Chicago City Council. (April 2, 2015 GSS Additional Information, p. 8.) Further, GSS stated that it uses a dust suppressant called Envirobind to minimize dust emissions. Finally, in its Fugitive Dust Plan, GSS noted that the “drainage area is graded such that the highest point corresponds to the unbermed portion on its eastern border where the wheel wash area is situated – i.e., at the point where vehicles enter and exit the vatted sulfur prill storage area. Runoff is collected via a storm sewer system that directs it to a detention pond....” (May 2015 Fugitive Dust Plan, Table 1.)

C. CDPH Determination: Due to the unique qualities of prilled sulphur as described above, CDPH conditionally grants the variance with regard to setbacks from the waterway. Thus, GSS may maintain portions of the prilled sulphur storage pile within 50 feet of the Calumet River on three conditions: 1) that GSS maintain the existing asphalt containment berm

in good condition,2) that GSS comply with the requirements of PD 1178, including maintenance of the required landscaping; and 3) that GSS not permit any sulphur prills to fall into the river.

7. High Wind Events.

A. Detailed High Winds Variance Request: Section 5.0(4) of the Bulk Material Regulations provides that disturbance of outdoor bulk solid material piles, including loading, unloading and processing, shall be suspended during high wind conditions, “unless alternate measures are implemented to effectively control dust in accordance with the approved Fugitive Dust Control Plan.” Pursuant to Section 2.0(12), “high wind conditions” are “when average wind speeds exceed 15 miles per hour over two consecutive five minute intervals of time.” GSS requested a variance from this section to allow it to handle sulphur prill during wind speeds up to 30 miles per hour. GSS stated that, because of the size and density of sulphur prill, the pellets are “unlikely to become airborne unless winds exceed 30 mph.” (April 23, 2014 GSS Variance Petition, p. 7.)

B. Analysis of Variance Request:

i. Minimization of Adverse Impacts. Section 8.0(2)(d) of the Bulk Material Regulations requires a demonstration that issuance of the variance will not create a public nuisance or adversely impact the surrounding area, environment, or property uses. GSS asserted that there will be no adverse impact from the handling of sulphur prills during wind speeds up to 30 miles per hour, because of the nature of the material. In support of this assertion, GSS provided a report issued by Devco USA, LLC, (“Devco”), a site designer and prilling equipment manufacturer. Devco provided information on “the proven history of successful operations of outdoor storage in all weather conditions.” (April 2, 2015 GSS Additional Information, Exhibit 7-A.) Specifically, pointing to the examples of several other outdoor sulphur stockpiles, Devco noted that: “Product size irregularity gives a high angle of repose to stored product and also resistance to disruption to wind speed.” *Id.* Devco further cited two sulphur piles in Louisiana and Texas that were “put to extreme tests of pile integrity during outstanding wind events from Hurricanes Katrina and Rita in 2005, along with Ike and Gustav [in] 2008,” events which left the piles undisturbed and did not require any extraordinary cleanup. *Id.*

ii. Alternative Compliance Program. In its letter of April 2, 2015 (on page 9), GSS noted that its revised Fugitive Dust Plan would specifically discuss operations during high wind conditions. Accordingly, the May 2015 Fugitive Dust Plan states that:

When the facility is staffed by GSS personnel, within 30-minutes of measuring (on-site) average wind speeds of at least 30 miles per hour over 10 consecutive minutes, GSS will conduct a visible emission assessment in accordance with EPA Method 22 for at least six (6) consecutive minutes. If the frequency of visible emissions observed is at least 10 percent of the total observation time (*i.e.*, as calculated by dividing the total visible emissions were observed, in seconds, by the total observation period, in seconds, and multiplying the resulting quotient by 100), then prill transfer operations will cease. Such operations will resume only after the average wind speed drops below 30 miles per hour, as measured over 10 consecutive minutes, or dust control methods set forth in the plan are implemented that effectively reduce the frequency of visible emissions to less than 20 percent, as demonstrated via a confirmatory Method 22 visible emissions assessment of at least six (6) minutes. [May 2015 Fugitive Dust Plan, p. 3-1 to 3-2.]

C. CDPH Determination: Due to the unique qualities of prilled sulphur as described above, CDPH conditionally grants the variance with regard to high wind events. Specifically, GSS may continue working with the prilled sulphur pile when wind speeds exceed 15 miles per hour on the condition that when wind speeds reach 30 miles per hour, GSS will implement the procedures outlined in its May 2015 Fugitive Dust Plan, including a visible emission assessment to determine if prill transfer operations should cease.

8. Dust Suppressant System.

A. Detailed Dust Suppressant System Variance Request: GSS requested CDPH to grant a variance from Section 5.0(5)(b) of the Bulk Material Regulations, which requires facilities to apply chemical stabilizers and/or maintain and operate water spray bars, a misting system, water spray systems and/or water trucks to prevent fugitive dust emissions. Specifically, GSS asserts that sulphur prill with a moisture content of 2% by weight shall not require the application of additional moisture with a fixed suppressant system, in that prilled sulphur “is

physically resistant to dust generation because it is formed into pellets of relatively uniform size with a smooth surface.” (April 23, 2014 GSS Variance Petition, p. 7.)

B. Analysis of Variance Request:

i. Minimization of Adverse Impacts. Section 8.0(2)(d) of the Bulk Material Regulations requires a demonstration that issuance of the variance will not create a public nuisance or adversely impact the surrounding area, environment, or property uses. As already mentioned, GSS submitted industry reports that confirmed the optimum moisture content of prilled sulfur is 1.5-2%, because this level of moisture suppresses dust due to “water mechanically adhering to the surface” of the prills. (April 2, 2015 GSS Additional Information, p. 5.) Furthermore, according to GSS, higher moisture levels cause problems, such as an increase in “uncontrolled movement in storage and transit.” *Id.* Thus, the addition of water through dust suppressant systems is not only unnecessary to minimize adverse impacts, but also detrimental to the product itself. (See also the analysis in Section III.3. above regarding transfer points.)

ii. Alternative Compliance Program. While GSS stated that the addition of water is not necessary to suppress dust from prilled sulphur, it did note that it uses a chemical dust suppressant called Envirobind. GSS stated that it “applies Envirobind in accordance with manufacturer instructions on an as needed basis to both avoid dust accumulation in the travel path around the prill pile and to maintain the pile’s moisture content.” (April 2, 2015 GSS Additional Information, p. 10.) As further stated in the May 2015 Fugitive Dust Plan, GSS, using a product “similar to Envirobind,” “will implement a program that will include a minimum of semi-annual application of a dust suppressant to the exposed pad to prevent or reduce the potential of dust from being formed as part of routine pad maintenance.” (May 2015 Fugitive Dust Plan, p. 3-2.) As further explained, the dust suppressant “will be applied with the use of a mobile tank trailer with a pump and spray bar. *Id.* In addition, the Dust Plan notes that if visible emissions are observed, transfer operations will cease until dust suppressant is applied or conditions change. *Id.*

C. CDPH Determination: Based on the considerations set forth above, CDPH conditionally grants GSS’s variance request regarding the application of dust suppressants. CDPH grants the variance subject to the following conditions pursuant to Section 8.0(3)(c):

1) GSS must apply dust suppressants to the exposed pad as needed, on at least a semi-annual basis as described in GSS's May 2015 Fugitive Dust Plan, or as otherwise recommended by the dust suppressant manufacturer; and

2) GSS must cease operations if visible opacity exceeds 10 percent, as set forth in Section 3.0(2)(b) of the Bulk Material Regulations.

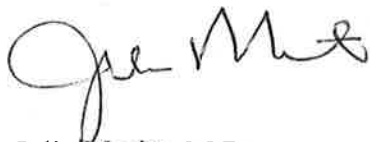
CONCLUSION

CDPH's determinations regarding GSS's variance requests will be effective as of the date of this letter, and will be posted, along with appendices and supporting materials, on CDPH's website at www.cityofchicago.org/environmentalrules. Please be advised that if GSS fails to comply with the Bulk Material Regulations within the timeframes provided above, GSS will be subject to enforcement action including daily fines in the amount of \$1,000 to \$5,000 per violation as provided by Section 11-4-810(a)(7) of the Chicago Municipal Code. Furthermore, CDPH may issue a summary abatement order pursuant to Section 11-4-025(c) of the Chicago Municipal Code, requiring GSS to correct any violations within a timeframe prescribed by the Commissioner.

Finally, in accordance with Section 8.0(3)(d) of the Bulk Material Regulations, CDPH reserves the right to revoke the variances granted herein if the Commissioner finds that operation of the facility pursuant to a variance is creating a public nuisance or otherwise adversely impacting the surrounding area, surrounding environment, or surrounding property uses.

Please contact Assistant Commissioner Dave Graham at (312) 745- 4034 if you have any questions regarding the above.

Sincerely,



Julie Morita, M.D.
Commissioner

cc: Mort Ames, DOL