

PUBLIC

UNITED STATES OF AMERICA
BEFORE THE FEDERAL TRADE COMMISSION
OFFICE OF ADMINISTRATIVE LAW JUDGES



In the Matter of

Tronox Limited
a corporation,

National Industrialization Company
(TASNEE)
a corporation,

National Titanium Dioxide Company
Limited (Cristal)
a corporation,

And

Cristal USA Inc.
a corporation.

PUBLIC

Docket No. 9377

**COMPLAINT COUNSEL'S POST-TRIAL
REPLY FINDINGS OF FACT AND CONCLUSIONS OF LAW**

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PROPOSED FINDINGS OF FACT**I. THE PARTIES, THE TRANSACTION, AND THE PROCEEDING.****A. The Parties****a. Tronox**

1. Tronox, Ltd. is a public company traded on the New York Stock Exchange (TRX). (Arndt, Tr. 1355¹; PX0001-004). Tronox's global corporate headquarters are in Stamford, Connecticut. (Mei, Tr. 3143²; PX0001-004). Tronox is registered to do business under the laws of Australia. (PX0001-004).

Response to Proposed Finding No. 1

Complaint Counsel has no specific response.

2. Tronox is a global producer of titanium dioxide ("TiO₂") pigment and titanium-bearing mineral sands. (RX1014; PX9053-010, -012). Tronox has global operations in North America, Europe, South Africa, and Australia, and serves customers around the world. (PX9053-012). Tronox's mines, feedstock facilities, and TiO₂ pigment facilities are located in the United States, Australia, South Africa, and the Netherlands. (Mei, Tr. 3149-51). Tronox has a research and development facility in Oklahoma City, Oklahoma. (Engle, Tr. 2437).

Response to Proposed Finding No. 2

Complaint Counsel has no specific response.

3. Tronox was spun off of Kerr-McGee in 2005. (PX0001-004). Kerr McGee "is the predecessor to Tronox." (Dean, Tr. 2919-20). In 1988, Kerr-McGee had one plant in Hamilton, Mississippi, which was much smaller than it is today. (Romano, Tr. 2219-20). In 1992, Kerr-McGee and Minproc built the Kwinana plant in Australia as a joint venture. (Romano, Tr. 2219-20). Around 1990, Kerr-McGee licensed its chloride technology to a company called Tiofine to convert their sulfate process facility at Botlek to a chloride process facility. (Dean, Tr. 2951-2952). Tiofine later sold the Botlek facility to Kemira in the 1990s. (Dean, Tr. 2951-52) In the early 2000s, Tronox acquired two facilities from Kemira: Botlek in the Netherlands and two other plants in Savannah, Georgia. (Romano, Tr. 2219-20; Dean, Tr. 2950).

¹ Mr. Brennen Arndt is senior vice president of investor relations at Tronox. (Arndt, Tr. 1353). Mr. Arndt began working at Tronox in May 2012 as vice president of investor relations. (Arndt, Tr. 1353). Mr. Arndt has approximately 34 years of experience in the chemical industry. (Arndt, Tr. 1392).

² Ms. Rose Mei is director of sales and operation planning (S&OP) and global logistics at Tronox. (Mei, Tr. 3140-41). Ms. Mei has worked at Tronox for five years, and has led global planning and logistics at Tronox since 2016. (Mei, Tr. 3140). Ms. Mei's responsibilities include "manag[ing] the distribution network, all the warehouses around the globe, to deliver the products to our customer and to make sure we have inventory in the right place to support the requirements anytime." (Mei, Tr. 3141). Ms. Mei has over 20 years global supply chain and logistics experience. (Mei, Tr. 3147).

Response to Proposed Finding No. 3

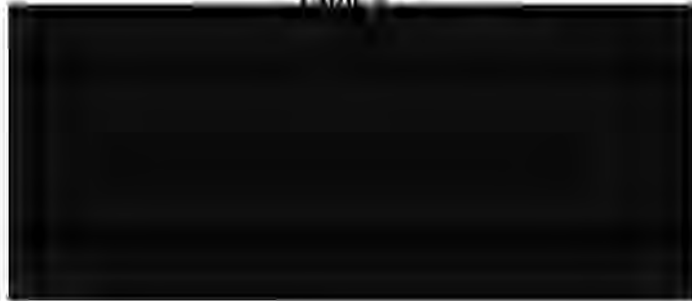
Complaint Counsel has no specific response to the Proposed Finding except to note that the last sentence is incomplete and misleading. The two plants in Savannah, Georgia acquired by Tronox from Kemira in the early 2000s were closed permanently in 2004 (sulfate TiO₂ plant) and 2009 (chloride TiO₂ plant). (CCFF ¶¶ 588-91).

4. Today, Tronox has three TiO₂ facilities, three mines, two slag plants, and one synthetic rutile kiln. (PX9053-12). Tronox's TiO₂ pigment plants are located in Hamilton, Mississippi; Botlek, The Netherlands; and Kwinana, West Australia. (Mei, Tr. 3151; Romano, Tr. 2231). Tronox employs about 3,200 people worldwide. (PX9053-12).

Response to Proposed Finding No. 4

Complaint Counsel has no specific response.

5. Tronox's total production capacity is approximately 465,000 metric tons of TiO₂ pigment per year. (Quinn, Tr. 2317; Engle, Tr. 2492). In 2016, TZMI, an industry analyst, reported that Tronox's production capacity of TiO₂ pigment was 236,000 tons per year for Hamilton (RX0105.0134); 152,000 tons per year for Kwinana (RX0105.0137); and 90,000 tons per year for Botlek (RX0105.0129).



Response to Proposed Finding No. 5

Complaint Counsel has no specific response.

6. As of September 2017, Tronox reported that it operates its TiO₂ pigment facilities at over 90% capacity utilization. (PX9053-012).

Response to Proposed Finding No. 6

Complaint Counsel has no specific response.

7. Tronox produces 91,000 metric tons of rutile and leucosene, 220,000 metric tons of synthetic rutile, 410,000 metric tons of titanium slag, 200,00 metric tons of zircon, and 221,000 metric tons of pig iron annually. (PX9053-12). With its mines and pigment facilities, Tronox is the “[w]orld’s largest fully vertically integrated titanium mining-to-titanium dioxide value chain with 3 mineral sands mines and 3 pigment production facilities.” (PX9053-011).

Response to Proposed Finding No. 7

The first sentence of the Proposed Finding is misleading, inaccurate, and not supported by the cited source (PX9053 at 012). The cited slide in a Tronox public presentation, filed with the SEC, clearly states that the cited information is for Tronox’s “Feedstock and Co-Products Nameplate Capacity” which is not necessarily the same thing as “produc[ing]” these volume “annually” (except for the unlikely situation where Tronox’s capacity utilization rates for all feedstock and co-products facilities are 100%—a claim Respondents do not make here). (PX9053 at 012 (Tronox Form 8-K with the attachment)). Moreover, the number cited for zircon (“200,00 metric tons”) is not accurate as the nameplate capacity listed in the cited slide is “220 kMT [220,000 metric tons].” (PX9053 at 012).

The second sentence of the Proposed Finding is vague as to the meaning of the claim “[w]orld’s largest fully vertically integrated titanium mining-to-titanium dioxide value chain” which is not defined anywhere and not supported by any fact other than the simple fact that Tronox has “3 mineral sands mines and 3 pigment production facilities.” (PX9053 at 012).

8. Tronox went into Chapter 11 bankruptcy in January 2009 and emerged from bankruptcy in February 2011. (Romano, Tr. 2209-10). In June 2012, Tronox acquired the mineral sands division of Exxaro Resources. (Romano, Tr. 2254; Mancini, Tr. 2798). In 2017, Tronox reported annual revenue of \$1.49 billion and EBITDA of \$279 million. (PX9053-012).

Response to Proposed Finding No. 8

The third sentence in the Proposed Finding is incomplete and misleading in that it does not clarify that the cited revenue and EBITDA figures are based on Tronox’s “LTM [last-twelve-months]” financial results through June 30, 2017, not for all of 2017. (PX9053 at 012 (September

2017 Tronox Form 8-K) (“LTM (as of 6/30/2017) Revenue of \$1,490 million and EBITDA of \$279 million”).

b. Cristal

9. The National Titanium Dioxide Company Ltd. (hereinafter “Cristal”), is a privately held company registered under the laws of the Kingdom of Saudi Arabia. (RX0171.0035).

[REDACTED] TASNEE is the parent company and owner of Cristal. (Stoll, Tr. 2063; [REDACTED]

[REDACTED] Cristal USA Inc. (“Cristal USA”) is an indirectly owned subsidiary of Cristal. (JX0001). Cristal USA operates an administrative and technical center in Baltimore, Maryland, and two TiO₂ manufacturing facilities in Ashtabula, Ohio. (JX0001).

Response to Proposed Finding No. 9

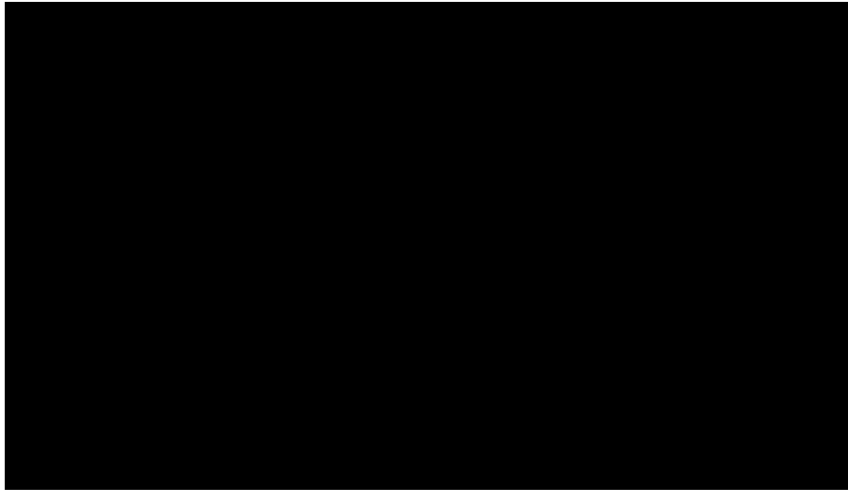
Complaint Counsel has no specific response.

10. Cristal subsidiaries operate TiO₂ pigment manufacturing facilities on five continents: Ashtabula (Ohio), Ashtabula II (Ohio), Yanbu (Saudi Arabia), Stallingborough (United Kingdom), Bunbury (Australia), Bahia (Brazil), Fuzhou (China), and Thann (France). (JX0001). Cristal mines feedstock in Brazil and Australia. (PX9053-016). Cristal and its subsidiaries employ approximately 4,100 people worldwide. (PX9053-014). Cristal does not produce enough feedstock to supply its own pigment plants, and therefore purchases feedstock on the market for its pigment production. (Stoll, Tr. 2111; Turgeon, Tr. 2604).

Response to Proposed Finding No. 10

Complaint Counsel has no specific response.

11. Cristal is the world’s second largest TiO₂ pigment producer. (PX9053-014). Cristal’s annual nameplate capacity for TiO₂ production is approximately 858,000 metric tons. (PX9053-014). [REDACTED]



Response to Proposed Finding No. 11

The last sentence of the Proposed Finding and the information presented in the accompanying Table 5, copied from Mr. Stern's expert report (RX0171), relies on improper evidence and is inaccurate, and thus should be disregarded or given little weight by the Court. The information regarding Cristal's nameplate capacity at its TiO₂ pigment plants is a factual proposition that should be established by fact witnesses or documents from Cristal, not through an expert witness hired by Tronox. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). This improper reliance on the Tronox expert for Cristal's nameplate capacity resulted in overstating the nameplate capacity for Cristal's Yanbu, Saudi Arabia plant in Table 5 by more than 10%. During the trial, Mr. Graham Hewson, who was Cristal's vice president of manufacturing between 2013 and 2017 and oversaw Cristal's all TiO₂ pigment production sites including Yanbu, confirmed that the nameplate capacity for the Yanbu chloride TiO₂ production plant is { [REDACTED] [REDACTED] }. (Hewson, Tr. 1607-08 (*in camera*)).

12. [REDACTED] In 2015, Cristal extended its global footprint into China by acquiring Jiangxi Tikon Titanium Company. (Stoll, Tr. 2106).

Response to Proposed Finding No. 12

Complaint Counsel has no specific response.

B. The Transaction

a. Background & Terms

13. Tronox had been in conversation with Cristal regarding a potential deal since 2015. (Quinn, Tr. 2302; RX0236.0001). In October 2016, Tom Casey, then-CEO of Tronox, reported to the board of directors that Tronox and Cristal had reached a “preliminary framework for a deal.” (Quinn, Tr. 2300).

Response to Proposed Finding No. 13

Complaint Counsel has no specific response.

14. On November 23, 2016, Tronox and Cristal agreed to non-binding deal construct, and due diligence between the parties commenced. (PX9053-18).

Response to Proposed Finding No. 14

Complaint Counsel has no specific response.

15. On February 21, 2017, Tronox announced a definitive agreement to acquire the titanium dioxide (“TiO₂”) business of Cristal. (PX0009-001; PX0001-005).


Response to Proposed Finding No. 15

Complaint Counsel has no specific response.

16. Tronox initially anticipated closing its acquisition of Cristal in the first quarter of 2018. (PX9053-18).

Response to Proposed Finding No. 16

Complaint Counsel has no specific response.

17. 
Shareholders approved the transaction on October 2, 2017. (PX9053-18).

Response to Proposed Finding No. 17

Complaint Counsel has no specific response.

18. To fund the cash portion of the purchase price for the acquisition of Cristal, Tronox sold its Alkali business to Genesis Energy LP in September 2017 for \$1.325 billion. (Quinn, Tr. 2306-07; PX9053-010).

Response to Proposed Finding No. 18

Complaint Counsel has no specific response.

19. As part of the transaction, Tronox would receive Cristal’s “pigment operations, global pigment operations around the world, plus [Cristal’s] mineral sands operations in Australia and in Brazil.” (Quinn, Tr. 2309-10; RX0236).

Response to Proposed Finding No. 19

Complaint Counsel has no specific response.

20. Tronox projected that after the transaction, its TiO₂ pigment production would grow to 1.3 million tons annually with 11 production plants in 8 countries. (PX9053-15).

Response to Proposed Finding No. 20

Complaint Counsel has no specific response.

b. This Highly Synergistic Transaction Will Create a Lower-Cost, More Vertically Integrated, More Competitive Tronox.

21. “The overall strategic intent” of the Tronox-Cristal transaction is to lower Tronox’s costs, improve Tronox’s competitive position, and enable Tronox “to create a more viable, sustainable company throughout” all of the cycle of the cyclical TiO₂ industry. (Quinn, Tr. 2324; PX0010³).

Response to Proposed Finding No. 21

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The record evidence demonstrates that the proposed transaction is likely to reduce supply and raise prices. (CCFF ¶¶ 704-27; Malichky, Tr. 280-81 (“Q: And what specifically did Mr. Romano tell you about what they were planning to do with price? A. They were planning on raising the Cristal price at PPG. After the -- and let me -- after the transaction is complete, obviously, but after the

³ In PX0010, “Triangle” is the code name for Tronox and “Circle” is the code name for Cristal. “Hexagon” was the code name for the transaction itself. (Quinn, Tr. 2332-33).

transaction, they were going to raise the Cristal price. Q. And did Mr. Romano explain why? A. We had a long conversation about that that day, and we've had other conversations with him. And it relates to market discipline. Q. What do you mean by "market discipline"? A. Market discipline, as the way it was explained to me during that meeting and other meetings, is to be able to sell the product at a reasonable price and modulate production accordingly, and Cristal didn't have market discipline."); PX3000 at 004 (Venator Presentation) (projecting that the acquisition would { [REDACTED] [REDACTED] [REDACTED]) (*in camera*)).

In addition, the Proposed Finding is misleading, incomplete, and vague as to the meaning of the phrase "enable Tronox 'to create a more viable, sustainable company throughout.'" As a publicly-listed, for-profit corporation, Tronox's goal is to maximize its profit and thus, the intent of any transactions, including the proposed transaction, is to increase its profit margin, often presented as EPS (Earnings Per Share) or EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization). (*E.g.*, PX9040 at 005 (Tronox Investor Presentation)). Thus, what really matters for the antitrust analysis of this merger is not what an executive claims after the fact, but the merger's impact on the profit-maximizing incentive of the company after the transaction closes. (CCFF ¶¶ 549-51; *see also* PX5002 at 005, 025 (¶¶ 5, 50) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). The record evidence further shows that the claimed efficiencies are not merger-specific, verifiable, or likely to benefit North American customers. (CCFF ¶¶ 823-1017).

22. The transaction is "a highly synergistic acquisition." (Quinn, Tr. 2329; PX0010⁴). The synergies result from the fact that Tronox and Cristal are "complementary in terms of the

⁴ Mr. Jeffrey N. Quinn is the chief executive officer (CEO) of Tronox Ltd. (Quinn, Tr. 2293). Mr. Quinn has been on the board of executives at Tronox since 2011 when the company exited bankruptcy. (Quinn, Tr. 2294). Mr.

nature of the business.” (Quinn, Tr. 2341; PX0010-218). Tronox is “long” on feedstock. This means Tronox has more feedstock than is necessary to supply its TiO₂ pigment plants. (Turgeon, Tr. 2601-03).⁵ Cristal, by contrast, is “short” on feedstock. (Turgeon, Tr. 2604). “[T]hat’s where all the value of that deal come[s] into play.” (Turgeon, Tr. 2654). “[T]he acquisition of Cristal provides a better balance between feedstock availability and feedstock requirements to make TiO₂, because Cristal is feedstock short.” (Stern, Tr. 3851).

Response to Proposed Finding No. 22

The Proposed Finding is factually inaccurate, incomplete, misleading, and contrary to the weight of the evidence. First, { [REDACTED] }
[REDACTED]
[REDACTED] } (CCFF ¶ 1010; PX7036 (Keegel Dep. at 146) (*in camera*); PX1231 at 019 (Tronox Presentation) ({ [REDACTED] }) (*in camera*)). Also, Tronox currently sells its excess feedstocks in the market. (Turgeon, Tr. 2603).

Moreover, { [REDACTED] }
[REDACTED]
[REDACTED] } (PX0010 at 219 ({ [REDACTED] })
[REDACTED]
[REDACTED] }). And, { [REDACTED] }
[REDACTED] } (PX0010 at 219 ({ [REDACTED] })
[REDACTED]

Quinn became the CEO in December 2017. (Quinn, Tr. 2294). Mr. Quinn has 14 years of experience in the chemical industry, and approximately 14 years before that in mining and refining industries. (Quinn, Tr. 2295).

⁵ Mr. Jean-Francois Turgeon is the executive vice president of Tronox and chief operating officer (COO). (Turgeon, Tr. 2579). Mr. Turgeon was hired in January 2014 as the executive vice president of Tronox and president of the TiO₂ business. (Turgeon, Tr. 2579). Mr. Turgeon is a chemical engineer with a master’s degree in engineering. (Turgeon, Tr. 2579). For his master’s degree, Mr. Turgeon “wrote a thesis on the digestion of slag in the sulfate process.” (Turgeon, Tr. 2580). Mr. Turgeon worked for Rio Tinto, a mining company, for 24 years. (Turgeon, Tr. 2580).

_____ })).

Therefore, contrary to Tronox’s claim of “all the value of that deal” coming from the merging parties’ feedstock positions, { _____ } (PX0010 at 219 (*in camera*)). Thus, the proposed transaction does not solve the problem of Cristal being short on feedstock, since the combined company will be short on feedstock. (Turgeon, Tr. 2604).

Moreover, Respondents’ unsupported claim that this transaction is “a highly synergistic transaction” is misleading and incomplete in that it suggests that any anticompetitive effects resulting from the transaction will be outweighed by procompetitive efficiencies. The record evidence shows that the claimed efficiencies are not merger-specific, verifiable, or likely to benefit North American customers. (CCFF ¶¶ 823-1017). Further, the second sentence of the Proposed Finding is misleading, incomplete, and vague as to the term “complementary” because the record evidence shows that there is a direct competitive overlap between the chloride TiO₂ products produced by the parties and sold to their customers in North America. (CCFF ¶¶ 696-703). Finally, for all the reasons stated above regarding the merging parties’ feedstock positions, the last sentence of the Proposed Finding is factually inaccurate, incomplete, misleading, and contrary to the weight of the evidence. In addition, the last sentence of the Proposed Finding relies on improper evidence in that it relies solely on Mr. Stern, Respondents’ expert, for a factual proposition that should be established by fact witnesses or documents, not through expert testimony, and therefore should be disregarded by the Court. (*See* June 27, 2018 Order on Post-

Trial Briefs; Tr. 3794). Moreover, Mr. Stern has little, if any, relevant experience or expertise in the TiO₂ industry specifically. (Stern, Tr. 3855-59; *see* CCRRFF ¶ 65, below).

23. The transaction will create “the world’s most highly integrated titanium dioxide producer.” (Quinn, Tr. 2344; PX0010-176). Currently, Tronox is the “sixth largest” TiO₂ producer globally. (Quinn, Tr. 2345; PX0010-176). The largest producer, Chemours, is the “800 pound gorilla” in the TiO₂ industry. (Quinn, Tr. 2344; PX0010-176). Chemours “has large-scale assets,” “large-scale technology . . . that allows them to use a variety of feedstocks, including lower quality feedstocks,” and, critically, a “low-cost position.” (Quinn, Tr. 2344-45). The transaction will enable Tronox to compete with Chemours and Lomon Billions because it would lower Tronox’s costs and would make Tronox “on par with Chemours in terms of size to be able to serve a growing . . . global customer base.” (Quinn, Tr. 2345-46). The objective of the transaction is for Tronox “to be profitable throughout the cycle” of the TiO₂ industry. (Romano, Tr. 2217).

Response to Proposed Finding No. 23

The first sentence of the Proposed Finding is misleading, incomplete, and vague as to the term “most highly integrated” as Respondents have not put on any evidence of what the term means, how integrated any of its TiO₂ competitors are, or how “integration” is measured and compared.

The second sentence of the Proposed Finding is misleading and incomplete in that it discusses global capacity, not capacity that serves North America. There are only five producers that account for { } of the sales of chloride TiO₂ in North America. (CCFF ¶¶ 375-76). In 2016, Tronox has the { } market share for the sales of chloride TiO₂ in North America, while Cristal is { }. (PX5000 at 068 (Fig. 25) (Hill Initial Report) (*in camera*)). The proposed transaction would make Tronox much larger and roughly the same size as, in the words of Mr. Quinn, the “800 pound gorilla” Chemours. (PX5000 at 068 (Fig. 25) (Hill Initial Report) (*in camera*); Quinn, Tr. 2344).

The third and fourth sentences of the Proposed Finding are misleading, incomplete, and vague. The Proposed Finding discusses Chemours “large-scale” assets and technology, and unique cost saving advantages, but Respondents have failed to quantify the differences in scale between

itself and Chemours and the difference in costs. Tronox claims that Chemours has a cost advantage, while admitting that Tronox is already the lowest cost producer. (Turgeon, Tr. 2645). Moreover, the merger will not give Tronox or Cristal any larger scale assets or technology than they currently individually possess. The third and fourth sentences of the Proposed Finding also lack foundation. Mr. Quinn, who is a Tronox employee, is not a reliable source for information about Chemours' assets, technology, feedstock usage, or TiO₂ production costs.

The fifth sentence of the Proposed Finding is misleading, factually inaccurate and contrary to the weight of the evidence in that it suggests that Lomon Billions is a TiO₂ competitor with whom Tronox struggles to compete. The record evidence overwhelmingly shows that Lomon Billions is not a significant competitive factor in the North American market for chloride TiO₂. (CCFF ¶¶ 396, 747-812). The record evidence also shows that Lomon Billions' presence would not deter or counteract the likely anticompetitive effects of the merger in North America. (CCFF ¶¶ 794-807). The fifth sentence of the Proposed Finding is also factually inaccurate and contrary to the weight of the evidence. Instead of the proposed merger making Tronox more competitive with Chemours, the record evidence shows that the proposed merger would instead make the North American market for chloride TiO₂ more vulnerable to coordinated interaction (CCFF ¶¶ 398-550), and increase Tronox's incentive to unilaterally reduce output. (CCFF ¶¶ 551-694).

The sixth sentence of the Proposed Finding is misleading and incomplete. The record evidence shows that the additional profitability Tronox would achieve as a result of the proposed merger would likely be achieved through increased market power and anticompetitive output reductions. (*See* CCFF ¶¶ 398-694).

24. Tronox's customers have been growing and "want[] Tronox to grow with them," and the Cristal transaction was an "obvious way for [Tronox] to meet [its] customer requirement" and grow along with its customers. (Turgeon, Tr. 2645). Tronox's customer base is "made up

north of 50 percent global customers.” (Romano, Tr. 2238⁶). Tronox’s customers “are much bigger” than Tronox, especially true in the paint and coatings industry, where the paint companies are “multiple times” Tronox’s size. (Quinn, Tr. 23454-46; PX10). Tronox’s strategy on the commercial side “has been to grow with the customer[s] that are growing faster than the market.” (Turgeon, Tr. 2659). “So in order for us to be successful, we also need to grow faster than the market.” (Turgeon, Tr. 2659). In order to be able to supply these companies during their long-term growth, Tronox needs additional capacity. (Mancini, Tr. 2749-51). “Growing in size and substance allows” Tronox to improve its cost position overall and compete better. (Quinn, Tr. 2345-46; PX0010).

Response to Proposed Finding No. 24

The first sentence of the Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The finding suggests that customers favor the transaction as a way for Tronox to grow with them. To the contrary, customers and other industry participants have concerns about the proposed transaction and anticipate that it will lead to higher prices for chloride TiO₂ in the North American market if it is allowed to move forward. (CCFF ¶¶ 704-27).

The second sentence of the Proposed Finding is misleading, incomplete, not relevant to the antitrust analysis in that it describes half of Tronox’s customers as “global.” The market for chloride TiO₂ is regional, not global. (CCFF ¶¶ 148-49). Whether or not a customer is regional or global, chloride TiO₂ suppliers can price-discriminate and charge the customer different prices for chloride TiO₂ in North America than they do in other regions. (CCFF ¶¶ 148-64).

The third sentence of the Proposed Finding is misleading, incomplete, and vague in that it discusses customer size and asserts that they are larger than Tronox. First, the cited testimony does not support the assertion, because it does not cite to an existing part of the trial transcript

⁶ Mr. John Romano is senior vice president and chief commercial office (CCO) at Tronox. (Romano, Tr. 2214). Mr. Romano has been senior vice president and CCO for three years. (Romano, Tr. 2214-15). In total, Mr. Romano has been employed at Tronox for nearly 30 years. (Romano, Tr. 2214). Previously, Mr. Romano served as senior vice president of sales and marketing, senior vice president and president of the pigment division, head of marketing for the pigment division, and head of sales. (Romano, Tr. 2215). Based on Mr. Romano’s background and experience at Tronox and in the TiO₂ industry generally, Mr. Romano is knowledgeable to testify to Tronox’s business around the world, Chinese competition in the industry, TiO₂ pricing, and the market for both chloride-process and sulfate-process TiO₂. (Romano, Tr. 2218-19).

(even assuming it refers to pages 2345-46 of the transcript, Mr. Quinn's assertion regarding the size of Tronox's customers lacks foundation and provides no specifics regarding the actual sizes of those customers). (Quinn, Tr. 2345-46). Second, the general citation without a pincite to PX0010 does not support the assertion because it does not address customer size relative to Tronox. Even if the Proposed Finding were properly supported by the cited testimony and document, customer size would only be relevant to the extent that it gave them purchasing power, a fact that Tronox has failed to allege or support with evidence.

The fifth through eighth sentences of the Proposed Finding are misleading and incomplete in that they imply that Tronox needs to acquire Cristal in order to add capacity or continue growing. However, the evidence shows that Tronox does not need the proposed transaction to grow with its customers, but could itself continue to grow organically. (CCFF ¶¶ 1003-10). Additionally, the fifth through eighth sentences of the Proposed Finding are vague in that they fail to explain how "growing in size and substance" improves Tronox's cost position or helps it to compete. The record evidence demonstrates that the proposed transaction is likely to reduce supply and raise prices. (CCFF ¶¶ 704-27; *see* CRRFF ¶ 21, above). Growth by acquiring Cristal, rather than growth attained by Tronox organically, is likely to lead to anticompetitive harm. (CCFF ¶¶ 398-694).

25. The transaction will enable Tronox to better compete with growing Chinese companies, which benefit from "low labor costs," "low capital costs," and "assistance from . . . the Government" with respect to "developing a global business." (Quinn, Tr. 2347). The largest of the Chinese producers, Lomon Billions, is bigger than Tronox. (Turgeon, Tr. 2659-60; Romano, Tr. 2243-44; Engle, Tr. 2492-93). Lomon Billions has "grown rapidly" in recent years and has publicly stated that its goal is to "dominate [the TiO₂] industry within the next few years." (Quinn, Tr. 2347; PX0010). Today, Tronox faces "significant competition from China in all world regions" (Quinn, Tr. 2348), and Chinese competition in the future is going to get "more intense." (Quinn, Tr. 2348-49). Tronox "had to do something" to respond to Chinese competition. (Quinn, Tr. 2347). To deal with the competition, Tronox "chose to grow" to become "a vertically integrated producer of TiO₂ pigment." (Quinn, Tr. 2347-48; PX0010).

Response to Proposed Finding No. 25

The first sentence of the Proposed Finding is factually incorrect and contrary to the weight of evidence in that it implies that Tronox competes heavily with Chinese TiO₂ producers in North America. The record evidence shows that outside of the five major producers (Tronox, Cristal, Venator, Chemours and Kronos), other producers have a combined market share of less than {█} of the chloride TiO₂ sales in North America. (CCFF ¶ 382). Additionally, the first sentence of the Proposed Finding is misleading, incomplete, and vague in that it conflates chloride TiO₂ and sulfate TiO₂. The vast majority of TiO₂ manufactured in China is sulfate TiO₂. (CCFF ¶ 808). Sulfate TiO₂ does not compete with chloride TiO₂ in North America. (CCFF ¶¶ 26-133). Unlike sulfate TiO₂, chloride TiO₂ production does not benefit from low labor and environmental costs. (CCFF ¶ 770). {█} (CCFF ¶765). {█} {█} (CCFF ¶765). In fact, Chinese producers of chloride TiO₂ suffer from additional cost disadvantages. For example, feedstock prices in China are higher (CCFF ¶¶ 771-72), government and environmental regulations have increased there (CCFF ¶ 773), even {█} costs are higher (CCFF ¶ 767).

The remainder of the Proposed Finding is misleading, incomplete, and vague in that it states that Lomon Billions is “bigger” than Tronox without providing any relevant context. The record evidence shows that Tronox and Cristal are two of the largest competitors in North America, while Lomon Billions is insignificant. (PX5000 at 067-68 (¶ 152 & Fig. 25) (Hill Initial Report) (*in camera*); CCFF ¶ 382 (chloride TiO₂ producers other than the five major producers (Tronox, Cristal, Venator, Chemours and Kronos) have a combined market share of less than {█} of the chloride TiO₂ sales in North America)). Moreover, the hearsay assertion that Lomon Billions will “dominate” this industry is factually inaccurate and contrary to the weight of the evidence. The

record evidence, which includes ordinary course business documents and public statements from Tronox itself, shows that Lomon Billions will not have any appreciable impact on the North American market for chloride TiO₂, likely for many years. (CCFF ¶¶ 794-807; CCFF ¶¶ 745-812 (discussing Chinese TiO₂ producers generally); PX9101 at 008 (Q4 2017 Tronox earnings call) (“Jeffrey N. Quinn: Yes, I think we’re seeing all the incremental expansion over the next 18 to 24 months, will really kind of just be soaked up by incremental global growth. So we don’t see that, that incremental expansion [at Lomon Billions’ Jiaozuo plant] will significantly change the current dynamics.”); Quinn, Tr. 2410-11 (discussing PX9101)).

The Proposed Finding is misleading, incomplete, and vague in that it discusses competition with Chinese produced TiO₂ globally rather than in North America. The evidence shows that Chinese chloride TiO₂ does not compete significantly in North America and Chinese chloride TiO₂ sales would not expand in North America sufficient to offset anticompetitive effects. (CCFF ¶¶ 747-807). Respondent’s general citation to PX0010 without any pincites does not support the assertion that Tronox is growing and vertically integrating in response to Chinese competitors. Moreover, the record evidence shows that Chinese TiO₂ producers play almost no role in the chloride TiO₂ market in North America today, and that entry or expansion by Chinese TiO₂ producers would not be timely, likely, or sufficient to counteract the likely anticompetitive effects from the proposed merger. (CCFF ¶¶ 382, 745-93).

26. The transaction will not only “increase the size” of Tronox, but also “reduce the diversity of Tronox’s business.” (Quinn, Tr. 2328-29; PX0010). Combined with the elimination of the alkali business,⁷ the transaction will complete leadership’s plan to create a “real pure, plain titanium dioxide producer.” (Quinn, Tr. 2328-29; PX0010). New Tronox’s singular focus on

⁷ “Cristal’s business had better . . . earnings, better EBITDA, and better cash flow generation potential than the alkali business that (Tronox) were giving up.” (Quinn, Tr. 2319; RX0236). Thus, Tronox sold its alkali business “to fund the cash portion of the purchase price of the Cristal transaction.” (Quinn, Tr. 2307; RX0236). The alkali business was sold for approximately “1.3 billion in cash.” (Quinn, Tr. 2306).

TiO₂ will “enhance shareholder value” and “increase the growth rates for earnings and EBITDA.” (Quinn, Tr. 2329; PX0010).

Response to Proposed Finding No. 26

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The proposed transaction with Cristal has no effect on the “diversity” of Tronox’s business. The separate sale of its Alkali business is the transaction that reduced the “diversity” of Tronox’s business. (Quinn, Tr. 2328-29). The sale of the Alkali business has already been consummated and does not depend on the proposed transaction with Cristal. (Mancini, Tr. 2833; *see* RFF ¶ 26, fn. 7 (“[t]he alkali business *was sold...*” (emphasis added)); PX7007 (Van Niekerk, IHT at 9, 15) ([REDACTED] [REDACTED])) (*in camera*)). Thus, Tronox will be focusing solely on TiO₂ regardless of whether it acquires Cristal, but Tronox’s acquisition of Cristal would further increase transparency among North American chloride TiO₂ producers. (CCFF ¶¶ 537, 542).

27. The transaction will also generate efficiencies, which would allow Tronox to become more efficient, by spreading costs over a greater number of assets. (Mancini, Tr. 2749-51). The synergies Tronox expects to achieve in the Tronox-Cristal transaction generally fall within the following four major categories: (1) feedstock related synergies; (2) selling, general, and administrative (“SG&A”); (3) operating synergies; and (4) procurement, supply chain, and logistics. (Mancini, Tr. 2768-69; Quinn, Tr. 2336-37; PX0010).

Response to Proposed Finding No. 27

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The record evidence shows that the fixed cost efficiencies that Tronox claims are a result of the proposed merger are not cognizable. (CCFF ¶¶ 981-93).

With respect to the four categories of efficiencies, the record evidence shows that the claimed efficiencies are not merger-specific, verifiable, or likely to benefit North American

customers. (CCFF ¶¶ 823-1017). Additionally, the Proposed Finding is not fully supported by the evidence cited because Mr. Quinn's cited testimony lists five categories of efficiencies, not four. (Quinn, Tr. 2336-37). Moreover, PX0010, without any pincites, does not support the assertion that Tronox's proposed merger with Cristal will generate verifiable, merger-specific efficiencies that will benefit consumers of chloride TiO₂ in North America.

28. The transaction will allow Tronox to "grow and increase [its] footprint" and thereby be able to better compete in "a very competitive industry." (Quinn, Tr. 2318-19; RX0236). By increasing Tronox's "footprint in the pigment plants," the acquisition of Cristal would allow Tronox to run its mineral sands operations and smelters "all out," or at "full capacity."⁸ (Quinn, Tr. 2317-18). Tronox will be able to run assets full out by consuming the produced feedstock itself without having to attempt to sell it "into the merchant market, which may or may not be attractive at any given time." (Quinn, Tr. 2317-18). This would allow Tronox to produce more high-grade feedstock with the same facilities. (Quinn, Tr. 2317-18; RX0236). The advantage to Tronox of running its plants full out is that "it reduces" costs. (Quinn, Tr. 2321). "It takes the same fixed costs and spreads that out over a broader production volume," resulting in lower costs. (Quinn, Tr. 2321).

Response to Proposed Finding No. 28

The Proposed Finding is factually inaccurate, incomplete, misleading, and contrary to the weight of the evidence for the reasons stated below. The first sentence of the Proposed Finding is not supported by the evidence cited because it conflates Mr. Quinn's response to two different and unrelated questions. Mr. Quinn stated that increasing the company's footprint would allow it to run its mining operations all out, not allow it to better compete in "a very competitive industry." (Quinn, Tr. 2317-18). Mr. Quinn went on to say separately that Tronox was seeking to do an acquisition because the industry is competitive. (Quinn, Tr. 2318-19). The first sentence of the Proposed Finding is also not fully supported by RX0236, which specifically states that {

⁸ To run a plant "full out" means running at or above nameplate capacity, subject to good maintenance practices. In other words, "[r]unning as much volume through those plants" as possible. (Quinn, Tr. 2321).

[REDACTED]}. (RX0236 at 002 (2016 Tronox email) (*in camera*)).

The second sentence of the Proposed Finding is incomplete, misleading, factually inaccurate and contrary to the weight of the evidence in that it fails to acknowledge that the record evidence also demonstrates the proposed transaction is likely to reduce supply and raise prices. (CCFF ¶¶ 704-27; *see* CCRRFF ¶ 21, above). Additionally, the Proposed Finding does not support the assertion that using feedstock internally rather than selling it to the merchant market would result in higher feedstock production. The record evidence shows that { [REDACTED] [REDACTED] } so this claimed efficiency, if it existed at all, would likely vanish before it could even be implemented. (CCFF ¶ 1010; *see also* CCRRFF ¶ 22, above). Moreover, Tronox currently sells its excess feedstocks in the market. (Turgeon, Tr. 2603). There is nothing to prevent it from simply lowering the price and selling more. Moreover, the record evidence overwhelmingly shows that despite the fact that running at higher output levels might reduce fixed costs, { [REDACTED] [REDACTED] } (CCFF ¶¶ 586-612; PX5002 at 006-08 (¶¶ 8-10 & Fig. 1-3) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*); *see* CCRRFF ¶ 595, below) and can run its plants profitably at lower output levels (CCFF ¶ 594 (citing PX9033 at 012 (Tronox Q2 2012 Earnings Call) (“So that’s [operating at 80 percent capacity utilization] not an uncomfortable position for us. Obviously we would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it.”))). In addition, the record evidence shows that the claimed efficiencies are not merger-specific, verifiable, or likely to benefit North American customers. (CCFF ¶¶ 823-1017).

29. The transaction will also create “significant shareholder value” for Tronox’s investors. (Quinn, Tr. 2333; PX0010). The transaction is “significantly accretive from an

earnings-per-share basis,” will “create a stronger balance sheet and better free cash flow generation,” and will “have a deleveraging effect on the company because of the synergies and the EBITDA growth.”⁹ (Quinn, Tr. 2328). Tronox’s standalone TiO₂ business’s average EBITDA from 2011 through 2016 is \$428 million. After adding the average EBITDA for Cristal from 2011 through 2016 and the \$237 million of synergies annualized to \$428 million, it results in a pro-forma number of EBITDA for New Tronox—just “over a billion dollars.” (Quinn, Tr. 2331-32; PX0010-173).

Response to Proposed Finding No. 29

The Proposed Finding is misleading, incomplete, and vague in that it suggests that deleveraging can only be accomplished with the proposed transaction. Deleveraging could be accomplished in any transaction done by stock that is accretive on an earnings-per-share basis or simply with the sale of assets (e.g., Alkali). (Quinn, Tr. 2328, 2331; PX0010 at 173). Moreover, the Proposed Finding is not relevant to the antitrust question of whether the proposed merger is anticompetitive or not because a transaction that creates “significant shareholder value” for the merged firm by generating more profits can also be anticompetitive resulting in higher prices and reduced benefits for the customers.

In addition, the synergies mentioned in the Proposed Finding are factually inaccurate and contrary to the weight of the evidence. The record evidence shows that the proposed efficiencies are not merger-specific, verifiable, or likely to benefit North American customers. (CCFF ¶¶ 823-1017). Upon reviewing and analyzing Respondents’ synergy claims under the Horizontal Merger Guidelines, Dr. Zmijewski found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had not demonstrated that the claims are merger specific. (CCFF ¶¶ 830-32).

⁹ As explained by Mr. Quinn, “[l]everage . . . can kill a company. In a cyclical business . . . during downturns in the industry, if [a company is] highly leveraged, that’s a . . . problem. It also restricts [a company’s] . . . ability to invest in the business and . . . is a significant operating issue.” (Quinn, Tr. 2335-36; PX0010-174). “Tronox had just come from a period of time where it had that issue [of leverage] . . . so it was—the opportunity and the possibility of (deleveraging) relativity quickly was viewed by the board as being a very important component of the transaction.” (Quinn, Tr. 2335-36; PX0010-174).

30. Tronox's experience in the 2015 economic down cycle was another factor in its decision to seek to acquire Cristal. (Mancini, Tr. 2752). Tronox's experience in the 2015 down cycle caused it to realize it needed to establish a stronger base of profitability, and that it needed to lower the ratio of debt to EBITDA. (Mancini, Tr. 2752-55)

Response to Proposed Finding No. 30

The Proposed Finding is misleading, incomplete, and not relevant to the antitrust analysis in this case. The purported reason has no bearing on whether the transaction is anticompetitive and is not a factor the Court should consider in deciding whether the merger is anticompetitive pursuant to the Clayton Act and under the Horizontal Merger Guidelines. (*See* CCRRFF ¶ 32, below). In addition, the Proposed Finding is vague as to the meaning of "stronger base of profitability" for the reasons laid out in response to Proposed Finding No. 29.

31. If the transaction is not allowed to move forward, Tronox risks becoming "irrelevant" in the global TiO₂ market, in large part because of "very aggressive," low-cost Chinese competitors. (Turgeon, Tr. 2733-34). "That's the reason why we're doing that deal with Cristal." (Turgeon, Tr. 2733-34).

Response to Proposed Finding No. 31

The Proposed Finding is factually inaccurate, incomplete, misleading, contrary to the weight of the evidence, and not relevant to the antitrust analysis in this case. For example, { [REDACTED] } (PX0010 at 164-257 (*in camera*)).

In addition, the Proposed Finding cites to Mr. Turgeon's testimony regarding competition from Chinese TiO₂ producers. But just a few months before testifying in this case, Mr. Turgeon made a public presentation at an RBC conference, where he detailed Tronox's projections that the Chinese would not be a substantial competitive threat to Tronox. Specifically, he described { [REDACTED] }

[REDACTED]

[REDACTED] } (RX0981 at 013, 016 (Tronox presentation) (*in camera*)). Mr. Turgeon’s statements at the RBC conference, in turn, echo recent public statements of other Tronox executives, such as Tom Casey. (CCFF ¶ 745 (*citing* PX9001 at 009 (Tronox Q3 2016 Earnings Call) (“So the question for us is, do we confront China-produced supply in the market as a competitive alternative to our supply. And as I’ve said, we don’t. . . . [T]he kind of customers that will buy our high-quality pigments are not simultaneously looking at for the same supply need Chinese product.”); PX9010 at 010 (Tronox Q2 2014 Earnings Call) (Chinese TiO₂ producers have thus far failed to establish themselves as a “material competitive presence, either in terms of volume or in terms of price. That implies to [Tronox] that it’s staying pretty much within the Chinese or the Asian market. I think a lot of supply generally from China generally tends to go into Latin America, then into the Middle East. It’s simply not a major force in our markets.”) Cristal, Kronos, Venator and Chemours have made similar comments, in several instances to investors that the Chinese producers are not a substantial competitive threat in the foreseeable future. (CCFF ¶¶ 763 (Cristal), 760, 762, 770, 772 (Kronos), 764-765 (Venator), 762 (Chemours)). Further, the evidence overwhelmingly shows that Chinese chloride TiO₂ does not compete significantly in North America and Chinese chloride TiO₂ sales would not expand in North America sufficient to offset anticompetitive effects. (CCFF ¶¶ 747-807; *see* CCRRFF ¶ 25, above).

C. Pre-Hearing Background & Proceeding

32. Tronox has fully cooperated with the FTC since announcing the proposed acquisition of Cristal on February 21, 2017. (PX0009; PX0001-005).

Response to Proposed Finding No. 32

The Proposed Finding is not relevant to the antitrust analysis in this case. Tronox's cooperation is not a factor the Court should consider in deciding whether the proposed merger is likely to be anticompetitive. (*See* PX9085 (Horizontal Merger Guidelines) (giving no indication that cooperation or lack of cooperation with the Commission's investigation should be a considered when determining whether a proposed merger is anticompetitive)).

33. On March 14, 2017, Tronox and Cristal filed a Premerger Notification and Report Form with the FTC and the Department of Justice pursuant to the Hart-Scott Rodino Act ("HSR Act") 15 U.S.C. § 18a. The filing informed the FTC of the transaction's "drop-dead" expiration date of May 21, 2018, which was more than a year away at that time. (PX0009).

Response to Proposed Finding No. 33

The Proposed Finding is not relevant to the antitrust analysis in this case. The timing of the Premerger Notification filing and the purported drop-dead date are not a factor the Court should consider in deciding whether the merger is anticompetitive pursuant to the Clayton Act and under the Horizontal Merger Guidelines. (*See* CCRRFF ¶ 32, above). Moreover, the Proposed Finding is misleading and vague as to the meaning of the term "'drop-dead' expiration date." In March 2018, Tronox and Cristal extended its agreement to March 31, 2019. (PX9102 at 003 (Tronox Public Presentation)).

34. The FTC issued a request for additional information and documentary material to assist its review of the merger on April 13, 2017. (PX0002).

Response to Proposed Finding No. 34

Complaint Counsel has no specific response.

35. Tronox substantially complied with the formal request for information on September 6, 2017. (PX0002).

Response to Proposed Finding No. 35

The Proposed Finding is factually inaccurate and is not supported by the cited evidence. PX0002 is "RESPONSE OF THE NATIONAL INDUSTRIALIZATION COMPANY" to the

FTC's request for information and does not provide the timing of substantial compliance by Tronox. (PX0002 at 001 (Cristal's Narrative Response to the Second Request) (*in camera*)). Tronox submitted its response on September 7, 2017. (PX0003 at 001 (Tronox's Narrative Response to the Second Request) ("Submission Date: September 7, 2017") (*in camera*)).

36. Cristal substantially complied with the FTC's request for additional information on September 13, 2017, providing requested information on September 6, 2017 and a log of documents withheld for privilege on September 20, 2017. (PX2003). The parties provided over 1.3 million documents comprised of 4.2 million pages, as well as narrative answers and comprehensive analysis to the Commission. (*See* PX0002, PX0003).

Response to Proposed Finding No. 36

The Proposed Finding is factually inaccurate and is not supported by the cited evidence. Cristal did not substantially comply with the FTC's request for additional information until it provided the required privilege log on September 20, 2017. The cited evidence for the first sentence of the Proposed Finding—PX2003 (November 2009 Cristal Strategy Presentation)—does not provide any support for the assertion that Cristal substantially complied on September 13, 2017.

37. Tronox and Cristal then granted the FTC additional time past their original deadline of October 23, 2017, to review the requested information, and by this agreement, the HSR waiting period expired on December 1, 2017. (PX9087). The FTC allowed the extended deadline to pass without acting and without announcement. (PX9086-005).

Response to Proposed Finding No. 37

The Proposed Finding is not relevant to the antitrust analysis in this case. The timing of the merging parties' HSR compliance or of the filing of the complaint is not a factor the Court should consider in deciding whether the merger is anticompetitive pursuant to the Clayton Act and under the Horizontal Merger Guidelines. (*See* CCRRFF ¶ 32, above).

The first sentence of the Proposed Finding is factually inaccurate. The "HSR waiting period" ended "30 days ... after the date of substantial compliance" as explained by the FTC's

Premerger Notification Office staff. (See *Getting in Sync with HSR Timing Considerations*, posted on Aug 31, 2017, available at <https://www.ftc.gov/news-events/blogs/competition-matters/2017/08/getting-sync-hsr-timing-considerations>). Because the parties substantially complied on September 20, 2017, the HSR waiting period expired on or about October 20, 2017. Timing agreements, like the one entered between the FTC staff and the merging parties during this merger investigation, “do not extend or otherwise toll the waiting period provided by the HSR Act.” (See, e.g., *Getting in Sync with HSR Timing Considerations*).

The second sentence of the Proposed Finding is factually inaccurate and misleading. As explained above, the HSR waiting period expired in October 2017. While the parties voluntarily agreed not to close the transaction before 11:59 PM on December 1, 2017, Tronox also could not close the transaction because of the ongoing review in other jurisdictions, which did not end until summer 2018. The agreement between the merging parties and Commission staff also required the parties to provide Commission staff 10 business days of advance notice before consummating the transaction, which the parties failed to provide properly. At the time of Tronox’s press release (PX9086), the company was aware that the matter was pending before the Commission for imminent further action, and that it could not close the proposed acquisition because of still pending reviews in other jurisdictions. Because the parties could not close the transaction, the FTC was not required to take any action at any point in December 2017. In any case, Complaint Counsel filed the Administrative Complaint to this Court and the FTC issued a press release when the Commission voted to issue the Complaint on December 5, 2017. (See *FTC Challenges Proposed Merger of Major Titanium Dioxide Companies*, posted on December 5, 2017, available at <https://www.ftc.gov/news-events/press-releases/2017/12/ftc-challenges-proposed-merger-major-titanium-dioxide-companies>).

38. On December 5, 2017, the two remaining commissioners at the FTC authorized Complaint Counsel to file a complaint against Tronox and Cristal and to seek a temporary restraining order and preliminary injunction in federal district court to block the Tronox-Cristal transaction. (RX1399).

Response to Proposed Finding No. 38

The Proposed Finding is factually inaccurate. The Commission did not “authorize[] Complaint Counsel to file a complaint against Tronox and Cristal” when the Commission voted on December 5, 2017. It was the Commission, pursuant to its authority under the FTC Act, that issued the Administrative Complaint and set the original trial date (May 8, 2018). The Commission also authorized staff to seek a temporary restraining order and preliminary injunction in federal court, if necessary, in order to maintain the status quo for the duration of the administrative process. (*See* FTC Challenges Proposed Merger of Major Titanium Dioxide Companies, posted on December 5, 2017, *available at* <https://www.ftc.gov/news-events/press-releases/2017/12/ftc-challenges-proposed-merger-major-titanium-dioxide-companies>). Such an action was not necessary until months later, as Respondents could not close the transaction as a result of an ongoing review by the European Commission. (*See* Commission Order Denying Respondents’ Motion to Stay and Temporarily Withdraw This Matter From Adjudication at 2, dated May 16, 2018, *available at* https://www.ftc.gov/system/files/documents/cases/docket_no_9377_tronox_cristal_ftc_order_denying_motion_05162018.pdf (“At present, there is no need for a preliminary injunction action to preserve the status quo.”)).

39. The Commission set a trial date for this matter of May 18, 2018. (Administrative Complaint, Docket No. 9377, December 5, 2017; Order Regarding Scheduling, Docket No. 9377, January 24, 2018).¹⁰ At a pretrial hearing before the FTC on this action, Complaint Counsel

¹⁰ The Commission initially set a trial date for this matter of May 8, 2018. (RX1399; Order Regarding Scheduling, Docket No. 9377, December 20, 2017). The Commission then postponed that trial date to May 18, 2018, due to a temporary government shutdown. (Order Regarding Scheduling, Docket No. 9377, January 24, 2018).

claimed that the FTC did not want to seek a preliminary injunction in federal court because Tronox had not yet received European regulatory approval to close. (Dec. 20, 2017, Pretrial Conf. Tr. 17).

Response to Proposed Finding No. 39

The Proposed Finding is inaccurate and misleading. At the time of the scheduling conference on December 20, 2017, Complaint Counsel did not seek a preliminary injunction in federal court because Complaint Counsel did not need one and thus did not have “a basis to seek emergency action from a federal court,” not because Complaint Counsel did not “want to” as Respondents mischaracterize in the Proposed Finding. (Dec. 20, 2017, Pretrial Conf. Tr. 17; *see also* Commission Order Denying Respondents’ Motion to Stay and Temporarily Withdraw This Matter From Adjudication at 2, dated May 16, 2018, *available at* https://www.ftc.gov/system/files/documents/cases/docket_no_9377_tronox_cristal_ftc_order_denying_motion_05162018.pdf (“At present, there is no need for a preliminary injunction action to preserve the status quo.”)).

40. On March 1, 2018, Tronox announced that it had extended its agreement with Cristal to December 31, 2018, with an automatic 3-month extension to March 31, 2019, if needed. (PX9102-03). The re-negotiated deal came at a cost: if (1) at any point between January 1, 2019 and March 31, 2019, Tronox decides not to proceed with the transaction due to regulatory uncertainty, *or* (2) if the deal expires on March 31, 2019, Tronox will be required to pay Cristal a \$60 million break-fee. (PX9102-003).

Response to Proposed Finding No. 40

The Proposed Finding is not relevant to the antitrust analysis in this case. The private agreements between the two merging parties with respect to timing are irrelevant as to whether the merger is anticompetitive pursuant to the Clayton Act and under the Horizontal Merger Guidelines. (*See* CCRRFF ¶ 32, above).

41. On May 17, 2018, the Court held a final prehearing conference between the parties. The hearing commenced in this case on May 18, 2018, when the Court heard opening statements from both sides and began hearing witness testimony. Testimony continued over the course of the next month, with trial proceedings on the following dates: May 18, 23-25, and 30-31 and June 1,

6-8, 13-15, and 20-22. Over the course of trial, exhibits were received into evidence from the Respondents as set forth in the exhibit index in **Exhibit A**, and live testimony was received into the hearing record from Tronox and Cristal fact and expert witnesses as set forth in the witness index in **Exhibit B**.¹¹

Response to Proposed Finding No. 41

Footnote 11 to the Proposed Finding is misleading, incomplete, and vague in that it suggests that Complaint Counsel was required to put on duplicative live testimony from 39 customers rather than representative testimony from five key industry participants, including the three largest customers in North America. Complaint Counsel submitted voluminous evidence from numerous other third parties in support of its case in the form of declarations and deposition testimony admitted in the record. The footnote is also incomplete in that it fails to acknowledge that Respondents did not call any customers, competitors, or even any executives from Cristal to offer live testimony at the trial. Nor did Respondents offer any declarations by industry participants in support of the proposed transaction.

II. BACKGROUND ON THE TIO₂ INDUSTRY

A. Titanium Dioxide (“TiO₂”)

42. TiO₂ is “an industrial chemical primarily used as a pigment.” (RX0171.0006; JX0001-02; *see also* Malichky, Tr. 275). TiO₂ is “the standard white inorganic pigment used in a wide range of products for its exceptional durability and its ability to impart whiteness, brightness and opacity.” (RX0171.0017; JX0001-02; Young, Tr. 641-42; Pschaidt, Tr. 965).

Response to Proposed Finding No. 42

Complaint Counsel has no specific response.

¹¹ At trial, Complaint Counsel notably presented testimony from only five customer witnesses despite having initially disclosed that as many as 39 customers were likely to possess information relevant to these proceedings. (Complaint Counsel’s Mandatory Initial Disclosures Pursuant to 16 C.F.R. 3.31(b), Docket No. 9377, December 18, 2017, pp. 1, Appendix A) These 39 non-parties were TiO₂ customers spanning every major industry that uses TiO₂: paint, coatings, paper, plastics, inks, and pharmaceuticals. (Complaint Counsel’s Mandatory Initial Disclosures Pursuant to 16 C.F.R. 3.31(b), Docket No. 377, December 18, 2017, pp. 1, Appendix A). At trial, Complaint Counsel called only five customer witnesses: four from the paint and coatings industry (representing PPG, Sherwin-Williams, Masco, and True Value) and one from the plastics industry (representing Deceuninck).

43. TiO₂ is used in “paints, plastics, paper, fibers, inks, food and cosmetics. It shows up in everything from toothpaste to coffee cups to whitewall tires, primarily whitening paint, plastics, paper and rubber.” (RX0171.0017-0018).

Response to Proposed Finding No. 43

The Proposed Finding is not supported by proper evidence. The Proposed Finding solely relies on Mr. Stern, Respondents’ expert, for a factual proposition that should be established by fact witnesses or documents. (Tr. 3254, 3794). Moreover, Mr. Stern has little, if any, relevant experience or expertise in the TiO₂ industry specifically. (Stern, Tr. 3855-59; *see* CCRRFF ¶ 65, below).

The Proposed Finding is also misleading and incomplete in that it does not state that the primary customers of TiO₂ include paint and coatings manufacturers and plastic producers, which account for approximately 60% and 25% of the TiO₂ consumed in North America, respectively. (CCFF ¶ 15). Paper and other specialty products use the remainder. (CCFF ¶ 15).

44. In coatings, TiO₂ “provides functional characteristics such as opacity, whiteness, brightness, hiding power, and durability.” (RX0171.0018; Malichky, Tr. 273). In plastics, TiO₂ “is used to aid in the consistency of color quality.” (RX0171.0018; RX1503). TiO₂ “is also used in various paper applications as a filler to add brightness, opacity, and printing consistency.” (RX0171.0018; RX1503).

Response to Proposed Finding No. 44

The Proposed Finding relies in part on improper evidence (RX0171, Mr. Stern’s expert report) for the factual propositions. (*See* CCRRFF ¶ 43, above). Further, the second and third sentences of the Proposed Finding is not supported by the cited document because the document, RX1503 (a 47-page document), contains no information regarding the functional characteristics provided by TiO₂ for the plastics and paper applications.

45. TiO₂ end use breaks down approximately as 60% coatings, 25% plastics, 10% paper, and 5% others specialty uses such as inks and pharmaceuticals. (Mouland, Tr. 1211). In a gallon of flat, latex, indoor paint, “between 20 and 40 percent of that could be titanium dioxide as raw material.” (Vanderpool, Tr. 162). Darker colors have the least amount of TiO₂ in them

because other colorants in the paint replace it. (Vanderpool, Tr. 163). Due to the different properties of different grades of TiO₂ provided by surface treatments, more TiO₂ in paint does not necessarily indicate higher quality—some surface treatments allow customers to use as much as 20 percent less in TiO₂ with the same effect. (Engle, Tr. 2453-54). [REDACTED]

Response to Proposed Finding No. 45

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence in that it suggests that the amount of TiO₂ in paint products can continually decrease when paint producers incorporate products like extenders like resin and high-hiding latex into their formulas. However, the record evidence indicates that there are limits and challenges when using products other than TiO₂ to increase a paint's opacity. (Young, Tr. 737-38 ([REDACTED]

[REDACTED] } (*in camera*); Malichky, Tr. 616 ([REDACTED]

[REDACTED] (*in camera*)).

46. [REDACTED]

[REDACTED] Producers also frequently make small improvements to the same grade without changing its number or price, and customers are able to continue purchasing the same grade for use in the same manner. (Engle, Tr. 2438-39).

Response to Proposed Finding No. 46

The first sentence of the Proposed Finding relies on improper evidence (RX0171, Mr. Stern's expert report) for a factual proposition that should be established by fact witnesses or documents. (Tr. 3254, 3794; *see also* CCRRFF ¶ 43, above).

The last sentence of the Proposed Finding that producers make improvements to a TiO₂ grade without changing its price is not supported by the cited testimony, which only discusses retaining the grade number and does not address price. (Engle, Tr. 2438-39 (“JUDGE CHAPPELL: So CR-826, I have been buying 30 tons of that for ten years, and you improve that next year, you are going to tell me, we have got the same grade number, but it’s new and improved? THE WITNESS: Yes, sir.”)).

a. TiO₂ Manufacturing Process

47. TiO₂ can be manufactured through either the chloride process or the sulfate process. (Turgeon, Tr. 2605-06; RX0171.0020).

Response to Proposed Finding No. 47

Complaint Counsel has no specific response.

48. The chloride process is a continuous process that uses chlorine gas. The reaction takes place in a high-temperature fluid bed. The feedstock is fluidized by chlorine, which creates a gas. The gas is then cooled, which creates a titanium tetrachloride molecule (“TiCl₄”). The molecule is then oxidized with pure oxygen at a high temperature, which alters the molecule to create TiO₂. (Turgeon, Tr. 2613-17).

Response to Proposed Finding No. 48

Complaint Counsel has no specific response.

49. In the sulfate process, feedstock is combined in batches with sulfuric acid. The sulfuric acid solubilizes the material into a “black liquor.” The oxide in the material is chemically changed to become a sulfate. The TiO₂ is then precipitated out of the “liquor” so that there is a waste acid and a solid titanium hydroxide. The titanium hydroxide is then “washed” and “calcined,” which creates a TiO₂ molecule. (Turgeon, Tr. 2613, 2617).

Response to Proposed Finding No. 49

Complaint Counsel has no specific response.

50. The chloride process is a continuous process, and the sulfate process is a batch process. (Turgeon, Tr. 2617-18). The sulfate process is more labor-intensive than the chloride process. These differences cause the chloride process to generally be more economically efficient than the sulfate process. (Turgeon, Tr. 2617-18).

Response to Proposed Finding No. 50

Complaint Counsel has no specific response.

51. Although there can be differences among both chloride-process and sulfate-process grades of TiO₂, a molecule of TiO₂ has the same chemical formula and molecular structure whether it's created through a sulfate process or a chloride process. (Turgeon, Tr. 2615, 2673; Malichky, Tr. 338-40).

Response to Proposed Finding No. 51

The Proposed Finding is misleading, incomplete, and not supported by part of the citation provided. Mr. Malichky, who holds several advanced degrees, including an MBA and a PhD in Pharmacology and Toxicology (Malichky, Tr. 268), testified that while the molecular structures of chloride TiO₂ and sulfate TiO₂ are the same, there are many things—including morphology, particle size, particle size distribution, impurities and surface treatment—that can be different. (Malichky, Tr. 339-42). As Mr. Malichky testified in the following exchange, even if the TiO₂ molecule and formula are right, “if it carries the wrong impurities with it and the color is wrong, it may not work in your end application.” (Malichky, Tr. 275-77).

JUDGE CHAPPELL: So if you have TiO₂ in front of you, it's a chemical; right?

THE WITNESS: Yes.

JUDGE CHAPPELL: Does it matter how it got there as long as it's TiO₂ and that's the chemical formula?

THE WITNESS: Yes, it matters.

JUDGE CHAPPELL: Why is that?

THE WITNESS: Because it's going to perform differently in our product.

JUDGE CHAPPELL: If you have H₂O, does it matter how it got to be H₂O?

THE WITNESS: Sometimes impurities even in water matter, right, and just because it's water, you wouldn't always drink it, just because somebody told you it's water. So the

iron example, if the water carried enough iron with it, you may not want to drink it. Or if the color was wrong, it was all cloudy or maybe a little bit green, and I told you it was water, you may not want to drink it either. So just because the molecule is right and the formula is right, if it carries the wrong impurities with it and the color is wrong, it may not work in your end application. And if your end application of water is to consume it, you would expect it -- you expect it to look like this; right, when you drink it (indicating)? And there's an assumed quality of residuals in the water when you drink it.

JUDGE CHAPPELL: "This" being a bottle of water?

THE WITNESS: Oh, sorry. Yes.

JUDGE CHAPPELL: All right. Thank you.

(Malichky, Tr. 275-77).

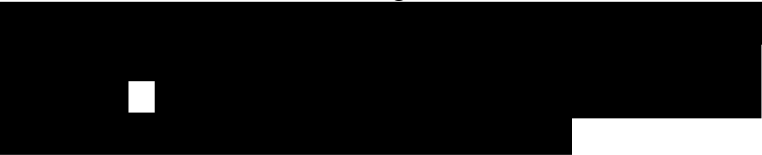
52. Once a TiO₂ molecule is obtained, producers differentiate their product by "finishing" the molecule into different "grades." Grades can be distinguished by differences in attributes such as surface chemistry, solubility, and durability. Various grades are used to make plastics, paints, paper, etc. (Turgeon, Tr. 2620-22). Regardless of whether TiO₂ is obtained through the chloride or sulfate process, it goes through the same "finishing" process in the "white end" of a TiO₂ plant. (Turgeon, Tr. 2614).

Response to Proposed Finding No. 52

The Proposed Finding is incomplete and misleading in that it suggests that the differentiator for different grades of TiO₂ is all the result of "finishing" the TiO₂ into different grades. However, Tronox acknowledges in its own documents that chloride technology, not the finishing process, is what "yields consistently whiter, brighter pigment grades preferred for many of the largest end-use applications (e.g. paints and plastics) as compared to the sulfate process." (PX1346 at 013 (Tronox Investor Presentation); *see also* PX1324 at 001 (Romano email to Casey) (Sulfate vs. Chloride competitive analysis) (*in camera*); CCFF ¶ 59). This superiority of chloride TiO₂ is confirmed by other TiO₂ producers as well as TiO₂ customers. (CCFF ¶¶ 59-66).

The Proposed Finding is misleading, incomplete, contrary to the weight of the evidence, and not supported by the citation provided. First, the cited testimony from Mr. Turgeon does not discuss Western producers, “tier one” Chinese producers, the sulfate TiO₂ and chloride TiO₂ products those producers manufacture, or whether such products are indistinguishable from one another. (Turgeon, Tr. 2614-15). Second, the record is replete with evidence suggesting that chloride TiO₂ has superior performance characteristics including whiteness, brightness, opacity, durability, and tint strength, which sulfate TiO₂ cannot match. (CCFF ¶¶ 58-92).

b. TiO₂ Feedstock

55. TiO₂ “feedstock” refers to the raw material that gets transformed into TiO₂ pigment. (Turgeon, Tr. 2580-81). 

Response to Proposed Finding No. 55

Complaint Counsel has no specific response.

56. The first step in developing TiO₂ pigment starts at the mining stage. (Turgeon, Tr. 2585-86). Unlike many materials, titanium is mined near the surface of the Earth, typically as deep as 20-60 meters. The beginning material can either start as ilmenite, leucosene, or as natural rutile. (Turgeon, Tr. 2585-88).

Response to Proposed Finding No. 56

Complaint Counsel has no specific response to the Proposed Finding except to note that the second sentence of the Proposed Finding mischaracterizes Mr. Turgeon’s testimony. Mr. Turgeon testified that titanium is mined “up to 20 meter[s] or 60 feet deep”, not 20-60 meters deep. (Turgeon, Tr. 2588).

57. Tronox owns three mines: one on the west coast of Australia near Perth (Cooljarloo), one on the east coast of South Africa (KZN Sands), and one on the west coast of South Africa (Namakwa Sands). (Turgeon, Tr. 2590). Although other TiO₂ producers also own

mining facilities,¹² Tronox is the most vertically integrated of the world's TiO₂ producers. (Turgeon, Tr. 2593-94).

Response to Proposed Finding No. 57

The Proposed Finding is vague and lacks foundation. Mr. Turgeon does not explain what he relies upon or how he reaches the conclusion that Tronox is “the most vertically integrated” TiO₂ producer in the world. (Turgeon, Tr. 2593-94). Further, the meaning of the term “most vertically integrated” is vague and never defined or explained. Additionally, Footnote 12 to the Proposed Finding lacks foundation. Mr. Turgeon, who is a Tronox employee, is not a reliable source for information about the size and production volume of Cristal's mines.

58. TiO₂ is mined, essentially, from sand, and the heavy minerals are then separated out. (Turgeon, Tr. 2586-87). Tronox's mines are essentially “old beach[es] . . . from when the sea was a bit further in.” (Turgeon, Tr. 2586-87). The heavy minerals—ilmenite, natural rutile, and zircon—are concentrated in these sand dunes and are separated from the sands using gravity. (Turgeon, Tr. 2585-87). These heavy minerals are mined “on the surface,” not underground. (Turgeon, Tr. 2587).

Response to Proposed Finding No. 58

Complaint Counsel has no specific response.

59. Ilmenite is titanium oxide and iron oxide combined together. (Turgeon, Tr. 2589-90). It is a mineral that is lower in TiO₂ than natural rutile. (Turgeon, Tr. 2589-90). Ilmenite contains about 35%-65% TiO₂, while natural rutile is about 92%-96% TiO₂. (Turgeon, Tr. 2589-90). Occasionally a mine could also contain leucxene, which is approximately 65%-90% TiO₂. (Turgeon, Tr. 2589-90). Some ilmenite can be directly converted into TiO₂ pigment. Other ilmenite must go through an intermediate step called an “upgraded process.” (Turgeon, Tr. 2596-97).

Response to Proposed Finding No. 59

Complaint Counsel has no specific response.

¹² For example, Lomon Billions owns mines in China, Chemours owns a mine in northern Florida, and Kronos owns a mine in Norway. (Turgeon, Tr. 2593-94). Cristal owns mining operations in western Australia (Wonnerup Mine) and in eastern Australia (Ginkgo and Snapper Mines). Cristal's mines are much smaller and produce far less feedstock than Tronox's mines. (Turgeon, Tr. 2593).

60. This intermediate step creates a TiO₂ pigment plant feedstock. (Turgeon, Tr. 2596). Upgrading ilmenite to feedstock is generally more efficient and less wasteful overall than attempting to convert ilmenite directly into TiO₂. (Turgeon, Tr. 2595-96). Natural rutile is a high-value feedstock that can be directly converted into TiO₂ pigment. (Turgeon, Tr. 2595).

Response to Proposed Finding No. 60

Complaint Counsel has no specific response.

61. One way to convert ilmenite into feedstock is through “smelting.” (Turgeon, Tr. 2596-97). Smelting is a process where ilmenite is melted at high-temperatures in a furnace with anthracite, and the iron in the material is separated from the titanium. (Turgeon, Tr. 2596). The titanium product that results from smelting is called “slag.” (Turgeon, Tr. 2596-97). Slag is a feedstock that can be used in a TiO₂ pigment plant. (Turgeon, Tr. 2596-97). By smelting ilmenite into slag, the TiO₂ content rises from approximately 55% pure to 88% pure. (Turgeon, Tr. 2596-97).

Response to Proposed Finding No. 61

Complaint Counsel has no specific response.

62. After the iron is separated from the TiO₂ at a smelting facility, Tronox uses the TiO₂ slag in its pigment plants and sells resultant iron that is left over. (Turgeon, Tr. 2597-98).

Response to Proposed Finding No. 62

Complaint Counsel has no specific response.

63. Ilmenite can also be converted into “high-grade feedstock” called “synthetic rutile.” (Turgeon, Tr. 2598-99). Synthetic rutile is made in a kiln by rusting away the iron from the mineral sands. Synthetic rutile is approximately 92% TiO₂. Some mineral sands are easier to convert to feedstock in a slag process, while other work better in a synthetic rutile kiln. (Turgeon, Tr. 2598-99).

Response to Proposed Finding No. 63

Complaint Counsel has no specific response.

B. TiO₂ Industry

64. The TiO₂ industry “is a global business.” (Turgeon, Tr. 2660).

Response to Proposed Finding No. 64

The Proposed Finding is misleading, incomplete, and contrary to the weight of the evidence to the extent that it implies the proper antitrust market is global. The evidence is overwhelming that the proper market is the sale of chloride TiO₂ to customers in North America. (CCFF ¶¶ 143, 165-98, 226-31). Moreover, the Proposed Finding merely relies on the testimony of one witness from the entire trial and is taken out of context. (Turgeon, Tr. 2660).

65. The TiO₂ industry is part of the broader “chemical industry.” (RX01711.0014¹³). The chemical industry “produces over 70,000 different products, ranging from the chemicals first derived from the initial processing of organic or inorganic raw materials to finished consumer products.” (RX0171.0014). The production of basic industrial chemicals “falls into two broad categories, organic and inorganic chemicals.” (RX0171.0014). TiO₂ is an “inorganic chemical.” (RX0171.0014).

Response to Proposed Finding No. 65

Footnote 13 to the Proposed Finding is misleading, vague, and incomplete in that it fails to explain how Mr. Stern’s purported general experience in the chemicals and petroleum industry is relevant to his testimony of the TiO₂ industry specifically and fails to explain the nature of Mr. Stern’s consulting experience in the TiO₂ industry. In addition, the Proposed Finding is contrary to Mr. Stern’s own testimony regarding his lack of meaningful experience in the TiO₂ industry. Mr. Stern testified that he has never been employed by a TiO₂ customer or TiO₂ supplier, has never provided consulting services to a TiO₂ customer about procurement of TiO₂ or the customer’s technical use of TiO₂, and has never provided consulting services to a TiO₂ supplier about the sale, distribution, or manufacturing of TiO₂. (Stern, Tr. 3855-58). Mr. Stern further testified that he has never visited any TiO₂ manufacturing facility, including either

¹³ Mr. Kenneth M. Stern is a chemical industry expert. (RX0171.0005). Mr. Stern is senior managing director at FTI, with responsibility for FTI’s petroleum and chemicals practice. (Stern, Tr. 3694). Mr. Stern has a bachelor’s degree in chemical engineering and an MBA. (Stern, Tr. 3694). Mr. Stern has experience consulting in the TiO₂ industry. (Stern, Tr. 3697). Mr. Stern has testified regarding competitive effects of proposed transactions in the petroleum and chemicals industries, as an expert in those industries. (Stern, Tr. 3697). Mr. Stern has published regarding both the petroleum and chemicals industries. (Stern, Tr. 3697).

Respondent's TiO2 facilities. (Stern, Tr. 3859). Mr. Stern has never authored any articles about the TiO2 industry specifically and has never been interviewed about the TiO2 industry by any publication. (Stern, Tr. 3859). Footnote 13 to the Proposed Finding is also misleading about Mr. Stern's prior experience relating evaluating competitive effects of a merger. Mr. Stern admitted that he has never testified as an expert in connection with an antitrust case relating to a proposed merger or acquisition and has never been recognized by a court as an expert in assessing the likely competitive effects of a transaction. (Stern, Tr. 3861).

66. [REDACTED]

Response to Proposed Finding No. 66

This Proposed Finding is misleading and incomplete in that it does not distinguish whether the witness is including anatase and/or rutile sulfate TiO2 in his answer. The parties have conceded that anatase TiO2 is not part of the relevant product market (CCFF ¶¶ 333-36) and the evidence is overwhelming that the sales of chloride TiO2 to customers in North America is a relevant market, for which the "[t]otal global capacity of TiO2" is not directly probative. (CCFF ¶¶ 23-329).

67. [REDACTED]

Response to Proposed Finding No. 67

The Proposed Finding is misleading in that it includes capacity information for both chloride and sulfate TiO2. The evidence is overwhelming that the proper relevant market under which to analyze this merger is the sale of chloride TiO2 to customers in North America. (CCFF

¶¶ 23-329). Outside of the five major producers, other producers have de minimis sales of chloride TiO₂ in North America; those sales are included in the relevant market and account for a combined market share of less than {█}. (CCFF ¶ 382).

Second, the term “significant restructuring in the industry” is vague. While spin-offs have occurred in the industry, this in and of itself has not caused a significant shift in capacity and market shares between what are currently the five major North American chloride TiO₂ producers; there are just different owners of the companies while the physical assets have primarily stayed the same. (CCFF ¶¶ 377-81, 537-39). In fact, these spin-offs increased transparency in the market, creating TiO₂ producers which are publically traded companies that produce more publicly available information to competitors. (CCFF ¶¶ 537-50). The most significant change in the industry has been the shuttering of numerous facilities and the reduction of capacity in North America. (CCFF ¶¶ 586-612). For example, in 2009, Tronox closed the chloride TiO₂ facility in Savannah, Georgia, {█} (PX1486 at 004 (Tronox presentation) (*in camera*); Romano, Tr. 2164-65 (*in camera*)). {█}

{█}

{█} (PX0002 at 021 (Cristal Second Request Response) (*in camera*)).

68. Furthermore, since 2005, “there has been tremendous growth in Chinese TiO₂ capacity, including one new global player, Lomon Billions.” (RX0171.0026). “The majority of the remaining capacity is held by other Chinese producers.” (RX0171.0026).

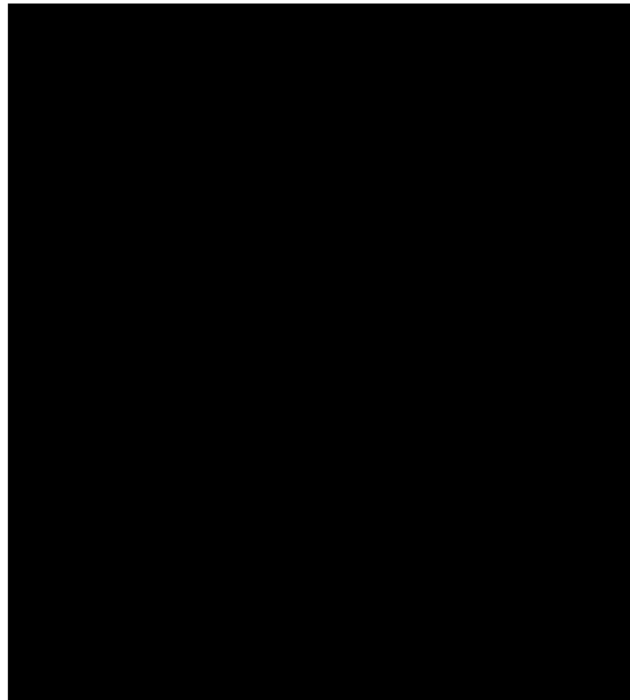
Response to Proposed Finding No. 68

The Proposed Finding is misleading in that it includes capacity information for both chloride TiO₂ and sulfate TiO₂. The evidence is overwhelming that the proper relevant market under which to analyze this merger the sale of chloride TiO₂ to customers in North America.

(CCFF ¶¶ 23-329). Outside of the five major producers, other producers, including all of Chinese TiO₂ producers, have de minimis sales of chloride TiO₂ in North America; those sales are included in the relevant market and account for a combined market share of less than {█}. (CCFF ¶ 382).

The “tremendous growth” mentioned in the Proposed Finding is misleading in that it refers primarily to sulfate TiO₂ production, not chloride TiO₂ production, and does not acknowledge that there has not been any significant increase in Chinese chloride TiO₂ imports into North America. (PX5000 at 067-68 (¶ 152 & Fig. 25) (Hill Initial Report) (*in camera*); CCFF ¶ 755). In fact, imports of chloride TiO₂ from all producers in China account for {█} of the North American market for chloride TiO₂. (PX5000 at 067-68 (¶ 152 & Fig. 25) (Hill Initial Report) (*in camera*); CCFF ¶ 755). According to a recent Tronox strategic plan, {█} {█} (PX1036 at 006 (July 2016 Tronox Presentation) (*in camera*); CCFF ¶ 756). Moreover, Chinese TiO₂ producers have struggled to produce chloride TiO₂. (CCFF ¶ 757). Finally, imports of TiO₂ from China, including both sulfate TiO₂ and chloride TiO₂, would not offset the anticompetitive impact from the proposed merger. (CCFF ¶¶ 747-807). Moreover, the term “new global player” used to describe Lomon Billions is vague and misleading. Lomon Billions does not have a market presence in the North American market and therefore cannot be considered global. (CCFF ¶¶ 797-800). Further Tronox’s own documents do not recognize that Lomon Billions is a global player. ({█} {█}) (PX1230 at 019 (Tronox Presentation) (*in camera*); CCFF ¶ 375).

69. As shown in Stern Figure 7 (RX0171.0027), global TiO₂ capacity in 2017 was split as follows: Chemours (15%); Cristal (11%); Venator (11%); Lomon Billions (8%); Kronos (8%); Tronox (7%); Others (40%).



Response to Proposed Finding No. 69

The Proposed Finding is incomplete and misleading. Figure 7 in the Proposed Finding, which Mr. Stern copied from a Deutsche Bank report and pasted into his expert report (RX0171) without conducting any independent analysis, does not distinguish production capacity by process type (i.e., between chloride TiO₂ and sulfate TiO₂). (RX0171 at 0027 (Stern Expert Report) (*in camera*)). However, even in a worldwide basis, “five firms—Chemours, Cristal, Tronox, Kronos, and Venator—dominate the production of chloride titanium dioxide.” (PX5000 at 020-21 (¶ 49 & Fig. 3) (Hill Initial Report) (*in camera*)). Moreover, the evidence is overwhelming that the proper relevant market under which to analyze this merger the sale of chloride TiO₂ to customers in North America. (CCFF ¶¶ 23-329). Outside of the five major producers, other producers have de minimis sales of chloride TiO₂ in North America; those sales are included in the relevant market and account for a combined market share of less than {█}. (CCFF ¶ 382).

70. The six largest producers (Chemours, Cristal, Venator, Lomon Billions, Kronos, Tronox) are commonly referred to as the “global producers.” (RX0171.0027). Each of the global

producers has “proprietary chloride technology: some producers have only chloride plants while others have a mix of chloride and sulfate plants.” (RX0171.0027).

Response to Proposed Finding No. 70

The Proposed Finding should be disregarded or given little weight by the Court because the assertion that “[t]he six largest producers (Chemours, Cristal, Venator, Lomon Billions, Kronos, Tronox) are commonly referred to as the ‘global producers’” is a factual proposition that should be established by fact witnesses or documents, not through expert testimony (or in this Proposed Finding, Mr. Stern’s expert report, RX0171, which is the only cited evidence). (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). Further, to refer to Lomon Billions as a “global producer” is misleading, factually incorrect, and not relevant. First, the term “global producer” is vague and suggests that Lomon Billions produces or sells significant amounts of product in all parts of the world. Second, it is unclear if this statement is referring to the production of all types of TiO₂ or chloride TiO₂ that is the relevant product under which this transaction should be analyzed. (CCFF ¶¶ 27-133). Moreover, Lomon Billions has limited amount of sales in North America. (CCFF ¶¶ 382-89).

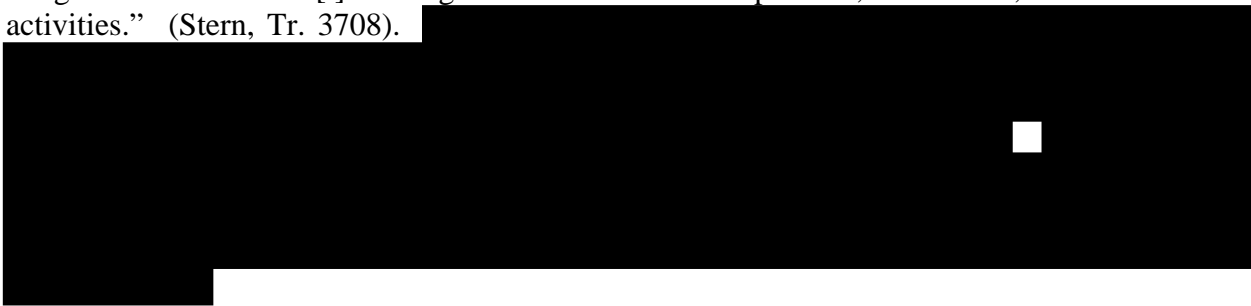
71. The TiO₂ industry “is part of a value chain that starts with the mining of the ore used to produce TiO₂ pigment and continues through the product end user.” (Stern, Tr. 3705-06; *see also* Quinn, Tr. 2310). A “value chain” is “a set of operations or processes that follow each other sequentially in order to transform a raw material—... a feedstock—into a building block[,] which then gets transformed into a chemical intermediate and finally into an end product.” (Stern, Tr. 3706). This also happens in the TiO₂ business. (Stern, Tr. 3706). In the TiO₂ industry, “raw materials (ores) are transformed into TiO₂ pigment, which is purchased by companies producing end-products such as paint or PVC piping.” (RX0171.0015). The demand for end products “is what drives demand for the chemical product TiO₂.” (Stern, Tr. 3708).

Response to Proposed Finding No. 71

The second to last sentence of the Proposed Finding “In the TiO₂ industry, ‘raw materials (ores) are transformed into TiO₂ pigment, which is purchased by companies producing end-products such as paint or PVC piping’” is not supported by the cited evidence (RX0171 at 0015).

Moreover, the last sentence of the Proposed Finding should be disregarded or given little weight by the Court because the assertion that “[t]he demand for end products ‘is what drives demand for the chemical product TiO₂’” is a factual proposition that should be established by fact witnesses or documents, not through expert testimony. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). Additionally, Mr. Stern has little, if any, relevant experience or expertise in the TiO₂ industry specifically. (Stern, Tr. 3855-59; *see* CCRFF ¶ 65, above).

72. In the TiO₂ industry, “[v]ertical integration is one of the key methods of achieving and maintaining competitive advantage in the chemical industry.” (RX0171.0016). “Vertical integration” refers to “[t]he integrated nature of . . . upstream, midstream, and downstream activities.” (Stern, Tr. 3708).



Response to Proposed Finding No. 72

The Proposed Finding is misleading, vague, and not probative with respect to the antitrust analysis of the proposed transaction in that it relies on statements regarding the “chemical industry” to support statements regarding the TiO₂ market. Additionally, Mr. Stern lacks the foundation necessary to analyze vertical integration in the TiO₂ market, since he has little, if any, relevant experience or expertise in the TiO₂ industry specifically. (Stern, Tr. 3855-59; *see* CCRFF ¶ 65, above). Moreover, while Mr. Stern can opine about the impacts of vertical integration in the chemical industry overall, the impact of vertical integration in the TiO₂ industry are factual propositions that should be established by fact witnesses or documents not through expert testimony. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794).

C. TiO₂ Pricing & Price Cycles

73. Tronox establishes prices for TiO₂ by negotiating every price individually with every customer around the globe. (Romano, Tr. 2227; Mouland, Tr. 1247). [REDACTED]

Response to Proposed Finding No. 73

The Proposed Finding is misleading, incomplete, and contrary to the weight of the evidence. While pricing may be individually negotiated, that has no bearing on whether TiO₂ producers are able to price-discriminate based on customer location. Rather, the fact that prices do vary by region—and, as Respondents concede, were persistently higher in North America—and the fact that Tronox sets different regional prices for a same customer that buys in multiple regions confirm TiO₂ producers' ability to price discriminate based on customer location. (CCFF ¶¶ 148-64, 172-258).

Moreover, Respondents' contention is undermined by both econometric work and the qualitative evidence. Dr. Hill ran a hedonic regression, which controls for different factors that determine price, and found that over time, there were persistent price differences between North America and other regions, even when controlling for both chloride TiO₂ grades and customer. (CCFF ¶¶ 162-63, 373). Those results are wholly consistent with evidence that customers consistently pay different prices for the same product depending on where the TiO₂ is sold/delivered (CCFF ¶¶ 172-92), and [REDACTED]

[REDACTED] (CCFF ¶ 155). Indeed, as PPG testified, { [REDACTED]
[REDACTED]
[REDACTED] }
(Malichky, Tr. 610 (*in camera*); CCFF ¶ 179).

Likewise, Mr. Mouland testified { [REDACTED]
[REDACTED] }. (Mouland, Tr. 1172 (*in camera*); CCFF ¶ 151). { [REDACTED]

[REDACTED] (Mouland, Tr. 1255 (*in camera*); *see also* Mouland, Tr. 1281 ([REDACTED] [REDACTED]) (*in camera*); CCF ¶ 151). In a 2015 email, Mr. Mouland wrote: [REDACTED] [REDACTED] (PX1345 at 004 (Mouland email to Duvekot) (*in camera*); CCF ¶ 151). According to Mr. Romano, Tronox’s Chief Commercial Officer, [REDACTED] (PX7001 (Romano, IHT at 123-24) ([REDACTED] [REDACTED] [REDACTED] [REDACTED]) (*in camera*); Romano, Tr. 2151-52 (*in camera*); CCF ¶¶ 151-59).

74. Tronox’s negotiations with its customers are affected by a number of factors, including “the supply-demand relationship” with the individual customer, “price,” Tronox’s “value proposition,” the “service” provided by Tronox, “consignment,” “vendor-managed inventory,” “who we’re competing” against, and “the market segment that we’re in” for a particular region or market segment, such as “whether it’s coatings or plastics.” (Romano, Tr. 2227). [REDACTED]

Response to Proposed Finding No. 74

The Proposed Finding is incomplete because it does not take into account the TiO₂ producers’ incentives not to undercut each other. Based on his review of the record, Dr. Hill concluded that producers in the relevant market exhibit mutual interdependence. (Hill, Tr. 1801; CCF ¶ 405). Tronox and Cristal’s internal planning documents illustrate the high level of recognized mutual interdependence. (CCF ¶¶ 407-11, 433-41).

75. Tronox distinguishes itself as a company through its “Total Value Proposition.” Tronox’s “Total Value Proposition” relies upon the consistency of the product and the quality of

the product. It also includes pricing, terms, and technical collaboration with customers—whether a customer needs help formulating products in their portfolio regarding TiO₂. (Mouland, Tr. 1204-05). Tronox’s value proposition includes providing services related to research and development, technical sales, and longer-term opportunities. (Romano, Tr. 2228-29).

Response to Proposed Finding No. 75

The Proposed Finding is incomplete and misleading as other North American TiO₂ producers also offer the sort of services that Tronox describes to be part of its differentiated “total value proposition.” For example, as Mr. Brian Christian of Kronos testified, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX7035 (Christian, Dep. at 63) (*in camera*); see also PX9025 at 003 (Chemours at Goldman Sachs Basic Materials Conference Transcript); PX9038 at 010-11 (Chemours Presentation)). Moreover, Mr. Romano testified that { [REDACTED]

[REDACTED]

[REDACTED] }. (PX7001 (Romano, IHT at 101) (*in camera*)).

76. Public price increase announcements or letters to individual customers announcing a price increase are just “the starting point of any price negotiation.” (Romano, Tr. 2230). Price change announcements do not provide accurate information, as producers do not know their competitors’ real as opposed to listed prices. (Mouland, Tr. 1166). [REDACTED]

[REDACTED]

Response to Proposed Finding No. 76

The Proposed Finding is factually inaccurate, incomplete, misleading, and contrary to the weight of the evidence. The statement that price change announcements do not provide accurate

information, as producers do not know their competitors' real as opposed to listed prices is factually inaccurate. Tronox's own actions and emails show that Tronox relies on those price increase announcements of their competitors in determining whether to increase prices themselves. (CCFF ¶¶ 463-74; 477-88). For example, when Chemours announced a price increase of \$150 per metric ton on December 17, 2015, {

[REDACTED]

[REDACTED]

[REDACTED] } (PX1046 at 002

(Casey email to Romano and Grebey) (*in camera*); CCFF ¶ 417). The day of the Tronox price increase of \$150 per metric ton Tom Casey wrote to the Tronox Board of Directors explaining

{ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX1047 at 001 (Casey email to Tronox Board

members) (*in camera*); CCFF ¶¶ 418-19; *see also* CCFF ¶ 421).

Further, Mr. Romano described { [REDACTED]

[REDACTED]

[REDACTED] }

(PX1021 at 002 (Romano email to Turgeon) (*in camera*); CCFF ¶¶ 412-13). Moreover, as Mr.

Duvekot testified, { [REDACTED]

[REDACTED] }. (PX7026 (Duvekot, Dep. at 52) (*in camera*); *see also*

CCFF ¶¶ 413-21).

Moreover, the major North American chloride TiO₂ producers over the years have increased TiO₂ prices typically in close proximity to each other in time. (CCFF ¶ 426). In addition, the claim that producers do not know their competitors' real as opposed to listed prices is also contrary to the weight of the evidence. The evidence is overwhelming that TiO₂ producers are aware of its competitors' prices and relies on that information when making its own pricing decisions. (CCFF ¶¶ 463-92).

Finally, the suggestion that pressure from Chinese competition is a major factor in implementing a full price increase is misleading, incomplete, factually inaccurate and contrary to the weight of the evidence. First, the evidence is overwhelming that the sale of chloride TiO₂ in North America is the relevant product market (CCFF ¶¶ 26-133), and that Chinese chloride TiO₂ does not meet the standards North American customers require. (CCFF ¶¶ 749-54). Imports of chloride TiO₂ from all producers in China account for { [REDACTED] } of the North American market for chloride TiO₂. (PX5000 at 067-68 (¶¶ 152 & Fig. 25) (Hill Initial Report) (*in camera*); CCFF ¶ 755). In fact, in a November 2016 presentation, Tronox observed that { [REDACTED] } (PX1006 at 015 (Tronox presentation) (*in camera*); *see also* PX1033 at 002 (Tan email to Engle) (Actual chloride TiO₂ production in China estimated at "0.1 mio mt per year" as compared to nameplate capacity of "0.24 mio mt"); CCFF ¶¶ 755-74).

77. [REDACTED]

Response to Proposed Finding No. 77

The Proposed Finding is misleading and incomplete. Mr. Christian's testimony makes clear that { [REDACTED] } (Christian, Tr. 931 (*in camera*)). Additionally, the Proposed Finding is misleading to the extent that it implies that customers have been successful with this tactic with Tronox. In fact, Tronox customers have not been successful with this tactic and pay different prices for each region. (CCFF ¶¶ 151-59, 173-98). For example, in negotiations with PPG, Mr. Duvekot of Tronox stated { [REDACTED] } (PX1085 at 001 (Mouland email to Duvekot) (*in camera*); CCFF ¶¶ 151-59, 203).

78. Tronox does not set prices for TiO₂ by region, rather by individual customer. (Romano, Tr. 2227; 2236-37). [REDACTED]

Response to Proposed Finding No. 78

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. That pricing may be individually negotiated has no bearing on whether TiO₂ producers are able to price-discriminate based on customer location. Rather, the fact that prices do vary by region—and, as Respondents concede, were persistently higher in North America—and the fact that Tronox sets different regional prices for a same customer that buys in multiple regions confirm TiO₂ producers' ability to price-discriminate based on customer location. (CCFF ¶¶ 172-

258). Moreover, Respondents’ contention is undermined by both econometric work and the qualitative evidence. Dr. Hill ran a hedonic regression, which controls for different factors that determine price, and found that over time, there were persistent price difference between North America and other regions, even when controlling for both chloride TiO₂ grades and customer. (CCFF ¶¶ 162-63, 373). Those results are wholly consistent with evidence cited above that customers consistently pay different prices for the same product depending on where the TiO₂ is sold/delivered, (CCFF ¶¶ 172-92), and [REDACTED] (CCFF ¶ 155).

79. Dr. Hill admitted that “there is no uniform North American price for TiO₂” because “prices vary by producer and by customer.” (Hill, Tr. 1932).¹⁴

Response to Proposed Finding No. 79

The Proposed Finding is misleading, incomplete and not relevant to the antitrust analysis. The lack of a uniform price is irrelevant, but what is relevant is the fact that a customer who buys in multiple regions pays different prices in those regions and the differences in prices across geographic regions are significant and persistent, reflecting regional competitive balance. (CCFF ¶¶ 172-98, 232-58). While prices may be individually negotiated, that has no bearing on whether TiO₂ producers are able to price-discriminate based on customer location. Rather, the fact that prices do vary by region—and, as Respondents concede, were persistently higher in North America—confirms TiO₂ producers’ ability to price discriminate based on customer location.

¹⁴ Dr. Hill is Complaint Counsel’s economist. Dr. Hill has “never submitted an expert report in any case before this case.” (Hill, Tr. 1967). Dr. Hill has never testified before — as an expert or otherwise. (Hill, Tr. 1967). Dr. Hill claims that he was previously “retained as a potential testifying expert” in three cases, but Dr. Hill did not submit an expert report, was not deposed, and did not testify in any of those cases. (Hill, Tr. 1659-60, 1967). For most of his professional life, Dr. Hill has worked on behalf of federal antitrust agencies. Prior to joining Bates White in July 2017, Dr. Hill worked for over a decade for federal antitrust agencies. (PX5000-123). Almost immediately after leaving government service, Dr. Hill was retained by the Federal Trade Commission around August 2017. (Hill, Tr. 1661).

(CCFF ¶¶ 232-58; *see also* PX9008 at 008 (Tronox Q4 2015 Earnings Call) (Tronox then-CEO Tom Casey’s reference to a “North American price”: “Are there different prices in the regional markets in which we do business? The answer to that question is yes. The European and Asian market prices and the Latin American market prices are relatively closely bunched with the North American price staying somewhat higher.”)).

Footnote 14 to the Proposed Finding is incomplete and misleading. Dr. Hill is an experienced and well-qualified economist who has spent his entire professional career, both within and outside government, assessing the economic impact of numerous mergers for twelve years and the various facts Respondents included in the footnote have no bearing on Dr. Hill’s competence to serve as an expert economic witness. (Hill, Tr. 1656-59, 1663; *see also* PX5000 at 123-28 (Appendix A) (Hill Initial Report)). Dr. Hill has performed the merger analysis under the framework of the Horizontal Merger Guidelines at least 50 times across a wide-range of industries, including dozens in commodity industries like the one at issue here. (Hill, Tr. 1658-59, 1663). Moreover, as Dr. Hill testified, both in government and as a consultant for a number of private parties, he has evaluated many mergers and concluded that they did not raise competitive concerns. (Hill, Tr. 1659). Additionally, neither his compensation nor that of his employer, Bates White, depended on the outcome in this case. (PX5000 at 007 (¶4) (Hill Initial Report)). Meanwhile, if Respondents’ false litmus test were somehow relevant, Complaint Counsel notes that Tronox’s own economic expert, Dr. Ramsey Shehadeh, has built his entire career around taking aggressive positions on behalf of merging parties before the United States antitrust agencies, and been criticized by at least one federal court for doing so. (Shehadeh, Tr. 3557-60; *United States v. Bazaarvoice, Inc.*, No. 13-00133, 2014 WL 203966, at *35 (N.D. Cal. Jan. 8, 2014) (criticizing

Dr. Shehadeh’s conclusion as “not credible” when he attempted to include distant competitors in the relevant market)).

80. Pricing for TiO₂ customers may differ by region due in part because “[e]very customer is different,” and because supply and demand can “fluctuate” over time as a result of “a variety of variables,” including the geographic region or country. (Romano, Tr. 2234). [REDACTED]

Response to Proposed Finding No. 80

The Proposed Finding is vague as to the type of TiO₂ and as to the term “a variety of variables.” The Proposed Finding is also misleading and incomplete in that it does not include the many other reasons why pricing differs by region that are supported by the weight of the evidence, including CCF ¶¶ 151-59. Dr. Hill concluded, based on his quantitative and qualitative analysis of Tronox and Cristal’s data and documents, including emails with customers, that { [REDACTED] [REDACTED] }. (Hill, Tr. 1714-15, 1717-18 (partially *in camera*)).

81. [REDACTED]

Response to Proposed Finding No. 81

The Proposed Finding is vague and not supported by the evidence cited. However, Complaint Counsel agrees with the substance of the statement (except that “usually” is an incorrect qualifier for the customers in North America, for whom “almost always” is more accurate). Proper citations for the delivered pricing are found at CCF ¶¶ 138, 165-71.

82. Moreover, TiO₂ customers in North America typically have supply contracts, while TiO₂ customers outside of North America normally do not have supply contracts, unless they are global offtakers. (Stern, Tr. 3728; Malichky, Tr. 372-73). Indeed, many customers in North America have price protections written into their contracts, whereby an announced price increase won’t affect price levels in North America for a longer period of time. (Stern, Tr. 3729; [REDACTED] [REDACTED]). If a customer has price protection in its contract, that customer will not be affected by increases announced by TiO₂ producers for a specified period of time—normally for at least, 90 days. (Stern, Tr. 3728-29; [REDACTED])

[REDACTED]). As a result of price protection, prices in North America tend to be “stickier” than the rest of the world, because of the nature of the contracts of much of the North American market; price protection clauses in North America cause a delay in upward changes in price. (Stern, Tr. 3732).

Response to Proposed Finding No. 82

A portion of the Proposed Finding is not supported by the evidence cited. { [REDACTED]

[REDACTED]

[REDACTED] } (Young, Tr. 687 (*in camera*)).

Further, { [REDACTED]

[REDACTED] }

(Malichky, Tr. 372-73 (*in camera*)). Moreover, to the extent that North American contracts contain pricing protection extending to 90 days, it would allow for frequent quarterly price changes allowing North American chloride TiO₂ sellers to quickly reap the benefits of a price increase. (CCFF ¶ 564).

Additionally, a portion of the Proposed Finding should be disregarded by the Court because Mr. Stern, Respondents’ expert, is being relied upon factual propositions that should be established by fact witnesses or documents not through expert testimony. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). Moreover, Mr. Stern lacks foundation, as he does not have relevant experience or expertise in the TiO₂ industry specifically. (Stern, Tr. 3855-59; *see* CCRRFF ¶ 65, above). These portions include the assertions that “TiO₂ customers in North America typically have supply contracts, while TiO₂ customers outside of North America normally do not have supply contracts, unless they are global offtakers” and “many customers in North America have price protections written into their contracts, whereby an announced price increase won’t affect

¹⁵ In order to implement TiO₂ price changes on an organizational level, buyers at PPG, for example, program the current price into the order system that people at their plants enter orders into. (Malichky, Tr. 625-26.)

price levels in North America for a longer period of time.” While Mr. Malichky is also cited for the proposition, { [REDACTED] } (Malichky, Tr. 372-73 (*in camera*)).

83. [REDACTED]

Response to Proposed Finding No. 83

The Proposed Finding is misleading in that it suggests that the price on any random day affects the antitrust analysis. What the price is on a certain day is not relevant to the analysis of the merger. Moreover, the phrase “different compositional factors” is vague, confusing and undefined. Dr. Hill ran a hedonic regression, which controls for different factors that determine price, and found that over time there were persistent price differences between North America and other regions, even when controlling for both chloride TiO₂ grades and customer. (CCFF ¶¶ 162-63, 373). Those results are wholly consistent with evidence that customers consistently pay different prices for the same product depending on where the TiO₂ is sold/delivered. (CCFF ¶¶ 172-92).

Dr. Hill determined in his analysis, based on invoice data from Tronox and Cristal, that North American TiO₂ customers consistently paid { [REDACTED] } for products made at Respondents’ North American factories. (CCFF ¶¶ 236-38; Hill, Tr. 1722-24 (partially *in camera*); PX5000 at 063-64 (¶ 144 & Fig. 24) (Hill Initial Report) (*in camera*); Shehadeh, Tr. 3633 ({ [REDACTED] }.) (*in camera*)). Customers agree with this conclusion.

(CCFF ¶¶ 234-35; Young, Tr. 673-74 ({ [REDACTED] }
[REDACTED]
[REDACTED] })
(*in camera*); RX0504 at 0001 ({ [REDACTED] }
[REDACTED]
[REDACTED] }) (*in camera*); see also CCFF ¶ 247).

84. [REDACTED]
[REDACTED]

Response to Proposed Finding No. 84

The Proposed Finding is misleading and incomplete for the reasons laid out in response to Proposed Finding No. 83. Moreover, as indicated in CCFF ¶ 258, after more than five years of higher North American prices (CCFF ¶¶ 232-57), { [REDACTED] } (PX5004 at 039 (¶ 90 & Fig. 17) (Hill Rebuttal Report to Shehadeh) (European prices spiked { [REDACTED] } because of a fire at a TiO₂ plant in Pori, Finland in early 2017, which caused a severe shortage.) (*in camera*); see also PX1437 at 019 (Tronox presentation) (*in camera*)). { [REDACTED] } [REDACTED]
[REDACTED]
[REDACTED] } (PX1437 at 019 (Tronox 2017 Presentation) (*in camera*); PX7015 (Maiter, Dep. at 164, 217); Hill, Tr. 1820-22 (*in camera*); PX5004 at 039 (¶¶ 89-90 & Fig. 17) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

85. [REDACTED]
[REDACTED]

Response to Proposed Finding No. 85

The Proposed Finding is misleading and incomplete in that it suggests that the size difference between what large producers pay and what smaller producers pay in the same region on any random day versus the difference in monthly average price between two regions affects the antitrust analysis. The relevant analysis is whether customers pay different prices for chloride TiO₂ in different regions. Dr. Hill ran a hedonic regression, which controls for different factors that determine price, and found that over time there were persistent price differences between North America and other regions, even when controlling for both chloride TiO₂ grades and customer. (CCFF ¶¶ 162-63, 373). Those results are wholly consistent with evidence that customers consistently pay different prices for the same product depending on where the TiO₂ is sold/delivered. (CCFF ¶¶ 172-92).

Moreover, Dr. Hill determined in his analysis, based on invoice data from Tronox and Cristal, that North American TiO₂ customers consistently paid { [REDACTED] } for products made at Respondents' North American factories. (CCFF ¶¶ 236-38; Hill, Tr. 1722-24 (partially *in camera*); PX5000 at 063-64 (¶ 144 & Fig. 24) (Hill Initial Report) (*in camera*); Shehadeh, Tr. 3633 ({ [REDACTED] } [REDACTED] } (*in camera*)).

86. The TiO₂ industry is a “notoriously cyclical business,” similar to the broader chemical industry. (Stern, Tr. 3735; Romano, Tr. 2217; Christian, Tr. 881). The TiO₂ business “cycles up and down based on supply and demand patterns.” (Romano, Tr. 2224). TiO₂ “price cycles” are part of this cyclicality. (Romano, Tr. 2224). “[I]n a cyclical business, it necessarily follows that prices will be cyclical, following the performance of the business.” (Stern, Tr. 3735-

36) As a result of these price cycles, the TiO₂ business experiences “ups and downs” in sales. (Turgeon, Tr. 2636).

Response to Proposed Finding No. 86

The Proposed Finding is misleading in that it suggests that there is a TiO₂ price cycle and that it affects antitrust analysis. Whether there is a TiO₂ price cycle is not relevant to the analysis of the merger’s likely effect on incentives. (PX5002 at 005 (¶ 5) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). As Dr. Hill explained in his expert report, the anticompetitive effects from the merger would apply to all points in the price cycle. (PX5002 at 005 (¶ 5) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)).

In addition, the first sentence of the Proposed Finding is misleading because it implies that all three individuals cited testified that TiO₂ is a “notoriously cyclical business,” when in fact only Mr. Stern, Respondents’ expert, who has little, if any, relevant experience or expertise in the TiO₂ industry specifically (Stern, Tr. 3855-59; *see* CCRRFF ¶ 65, above), used those words. Mr. Romano and Mr. Christian, both business executives in the TiO₂ industry, only used the word cyclical.

87. TiO₂ price cycles are driven by “supply-demand, capacity utilization and inventory,” with “supply-demand being the most significant.” (Romano, Tr. 2224-25). “The balance between supply and demand is one of the key reasons why the chemical industry in general and the TiO₂ business in particular exhibit cyclical performance.” (Stern, Tr. 3735-36). The primary “element of cyclicity” is that TiO₂ pricing fluctuates. (Christian, Tr. 881-82). TiO₂ prices fluctuate as a result of “supply-demand” and “negotiation[s]” with customers. (Christian, Tr. 885). As to negotiations, one “element” as to why the TiO₂ industry is cyclical is “because the customers have . . . significant strength.” (Christian, Tr. 881).

Response to Proposed Finding No. 87

The Proposed Finding is misleading as discussed in the Response to Proposed Finding No. 86 (*see* CCRRFF ¶ 86, above). In addition, the third sentence of the Proposed Finding is misleading because it mischaracterizes the testimony of Mr. Christian, who did not use or implicate

the word “primary” in his testimony. (Christian, Tr. 881-82 (“Q. And part of the reason that this industry is cyclical is because you can see pricing coming down at one part of the cycle; correct? A. Pricing does fluctuate, which is an element of cyclicity”)). Moreover, while the price cycles may be driven by supply and demand, evidence shows that Tronox has reduced its North American TiO2 output over the past decade to influence supply and support TiO2 pricing through both plant closures and throttled output. (CCFF ¶¶ 587-612). The qualitative evidence and data show that suppliers of chloride TiO2 in North America have found it profit-maximizing in the past to withhold output to support North American TiO2 prices. (PX5004 at 041 (¶ 94) (Hill Rebuttal to Shehadeh) (*in camera*); CCFF ¶¶ 586-630).

88. The TiO2 “price cycle tends to move globally.” (Romano, Tr. 2224-25). In other words, “there is no point in time where you’ll have pricing in one region moving up and in another region moving down.” (Romano, Tr. 2225). Rather, TiO2 prices globally “tend to lead and lag each other in some instances, depends on what market we’re in.” (Romano, Tr. 2225). As a result, “[s]ometime pricing is higher in one region” than another, on average. (Romano, Tr. 2236). For example, “[s]ince August of 2017, the price in North America has been the lowest in the world. At this particular stage, it’s almost \$400 lower than it is on a U.S. dollar basis in Europe.” (Romano, Tr. 2236).

Response to Proposed Finding No. 88

The Proposed Finding is misleading, vague, factually inaccurate and contrary to the weight of the evidence. The record evidence shows that the testimony from Respondents’ own employees contradict the cited testimony of Mr. Romano. (CCFF ¶ 151 (citing Moulant, Tr. 1255 (

_____})) (*in camera*); CCFF ¶ 159 (citing PX2245 at 083 (*In Re: Titanium Dioxide*

Antitrust Litigation, Deposition Transcript of Mark Stoll) (

_____})) (*in camera*); CCFF ¶ 225 (citing PX2252 at 040 (*In Re: Titanium*

Dioxide Antitrust Litigation, Deposition Transcript of Jerry Bassett) ([REDACTED] [REDACTED] [REDACTED]) (*in camera*)). The second sentence of the Proposed Finding contending that “there is no point in time where you’ll have pricing in one region moving up and in another region moving down” is also factually inaccurate as one of Tronox’s own slides shows for some periods, prices in different regions move in different directions. (PX1001 at 069 (Tronox Presentation); *see* CCRRFF ¶ 319, below).

Further, the Proposed Finding is misleading as it implies that prices are global. In fact, the evidence is overwhelming that there is a North American chloride TiO₂ market and the pricing is regional reflecting regional demand and supply. (CCFF ¶¶ 172-92). Tronox executives agree that [REDACTED] [REDACTED] } (PX1456 at 001 (Duvekot email to Tan and Mouland) (*in camera*); CCFF ¶ 177; *see also* CCFF ¶¶ 200-25).

The last sentence of the Proposed Finding is also incomplete and misleading, as indicated in CCFF ¶ 258, after more than five years of higher North American prices (CCFF ¶¶ 232-57), [REDACTED] [REDACTED] } (PX5004 at 039 (¶ 90 & Fig. 17) (Hill Rebuttal Report to Shehadeh) (European prices spiked [REDACTED] because of a fire at a TiO₂ plant in Pori, Finland in early 2017, which caused a severe shortage.) (*in camera*); PX7015 (Maiter, Dep. at 164) (*in camera*); Hill, Tr. 1820-22 (*in camera*)). Contrary to Respondents’ claim in the Proposed Finding, the fact that the price in Europe is almost \$400 above the price in the U.S. since mid-2017 actually supports the

regional nature of pricing, which reflects the regional balance of supply and demand. (CCFF ¶¶ 258, 631-35).

89. In the chemical industry, demand curves are typically easy to predict—they often follow GDP and slope upwards from left to right. (Stern, Tr. 3736-37). However, supply curves are different. They are “step functions,” such that they rise in “large gulps.” (Stern, Tr. 3736-37). This is because when someone builds a new plant, it is typically a large, world-scale plant, resulting in a significant increase in supply. (Stern, Tr. 3736-37). Because demand curves in the chemical industry are typically curved, and supply curves move in these “step functions,” there are times when supply is typically much higher than demand, which correspond with troughs in the industry. When demand catches up to supply, this typically corresponds with peaks in the business. (Stern, Tr. 3736-37).

Response to Proposed Finding No. 89

The Proposed Finding is misleading, incomplete, inaccurate, and vague in that its description of supply curves in the “chemical industry” is not directly applicable to TiO₂. First, it is fundamental economics that demand curves (with very rare exception) do not slope upwards from left to right. Demand curves slope downward from left to right, implying that elasticity of demand is negative. E.g., (PX5000 at 071–73 (Figs. 26, 27, 28); RX0170.0064 (Fig. 28)). This reflects the intuition and real world evidence that typically customers purchase less of a product when the price increases. Mr. Stern’s failure to understand basic economics is alone enough to reject his testimony as unreliable.

Second, in the last decade, the majority of new TiO₂ plants are small sulfate process plants located in China, with an average annual capacity of 50-60,000 tonnes (CCFF ¶ 730; PX0004 at 040, 048-051 (2015 TZMI TiO₂ Producers Cost Study)). Very few of these Chinese plants supply North American customers because their TiO₂ grades do not meet the customers’ product specifications (CCFF ¶¶ 305-08, 749). Indeed, Tronox offered testimony from Mr. Mancini that the Chinese plants only export 50,000 tonnes of TiO₂ into North America annually and that trade statistics do not delineate whether the TiO₂ is a chloride TiO₂ grade. (Mancini, Tr. 2692-93).

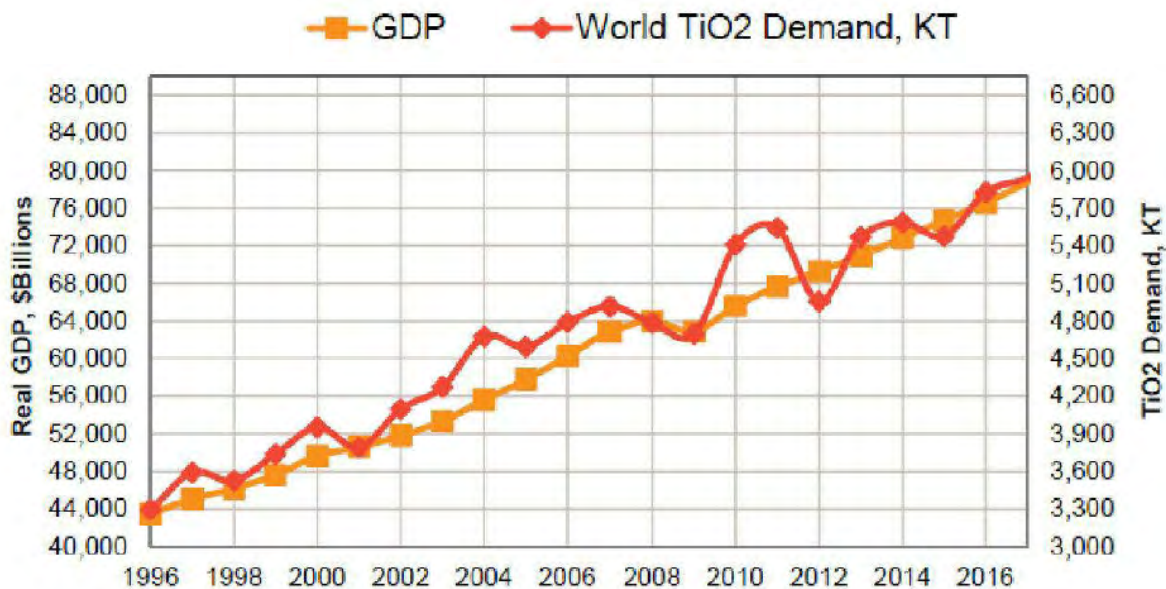
Because Chinese exports of chloride TiO₂ reflect a combined market share of less than {█} of the sale of the relevant product, (CCFF ¶ 382), it is a reach to describe new TiO₂ plants in China as a large addition or “gulp” to the supply of TiO₂ grades suitable for North American customers. And even if Chinese sulfate is included in the relevant market, the effect is still marginal. (PX5000 at 133) (¶ 294 & Fig. 42) (Hill Initial Report) (*in camera*)).

Third, sometimes, newly commissioned TiO₂ plants have a limited impact on overall supply because they are built to replace older TiO₂ plants. For example, in 2015, prior to commissioning its chloride TiO₂ plant expansion in Altamira, Mexico, Chemours closed its Edge Moor, Delaware chloride TiO₂ plant and closed production line 3 at its plant in New Johnsonville, Tennessee. (CCFF ¶ 584). These plant and production closures offset the supply increases from the new Altamira plant by roughly 150,000 metric tonnes. (RX0974 at 001).

Finally, according to a TZMI report, since 2010, global capacity for chloride grade TiO₂ has been very stable, showing no large additions, rather than showing large swings that result in “troughs” or “peaks.” (PX9077 at 042 (TZMI Q1 2016, TiO₂ Pigment Supply/Demand) (showing global capacity by process type since 2010)).

90. The driver of demand for TiO₂ is the “demand in end products.” (Stern, Tr. 3708) Factors such as price, level of competition, and number of players influence the demand for TiO₂ pigment. (Stern, Tr. 3709). TiO₂ is often referred to as a “lifestyle product,” because “its demand and demand growth rate are closely tied to GDP growth rates.” (Stern, Tr. 3709) Stern Figure 23 (RX0171.0063) shows the relationship between global GDP growth and TiO₂ demand growth on a global basis for the last 20 years.

Figure 23¹⁹⁰
Global GDP v. TiO₂ Pigment Demand



Response to Proposed Finding No. 90

The Proposed Finding is incomplete, misleading, factually inaccurate, not supported by the citations, and contrary to the weight of the evidence. First, this Proposed Finding purports to use Mr. Stern’s testimony to establish various factual propositions that should be established by fact witnesses or documents, not through expert testimony. (See June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). Notably, rather than relying only on global GDP, the parties’ ordinary course documents show that they rely on disaggregated national or regional GDP figures when forecasting demand. (E.g., PX1559 (Native) at Tab GDP Volume Data ({ [REDACTED] }) (in camera)).

Finally, in his expert report, Mr. Stern observed that GDP growth is additionally driven by “regional and local GDP and discretionary spending;” and demand for TiO₂ pigments is volatile with “recurring supply and demand imbalances,” driven by demand fluctuations for end products including “coatings, paper and plastics,” as well as natural disasters “that knock out production

leading to shortages that are compounded by demand spikes when rebuilding occurs.” (RX0171 at 063-64 (¶¶130, 132) (Stern expert report) (*in camera*)).

91. As shown in Stern Figure 23, “over a long period of time, TiO₂ demand tends to follow GDP.” (RX0171.0063-64). These curves track well over time, although there are a few periods where there are dislocations. One such example: following the great recession of 2008, 2009, there was a significant increase in world TiO₂ demand. (Stern, Tr. 3710; RX0171.0063).

Response to Proposed Finding No. 91

Complaint Counsel has no specific response.

92. Plant operating rates fell globally in 2012 because, after the great recession of 2008, demand for TiO₂ increased substantially in 2010 and 2011, which caused prices for the product to rise; however, there was simultaneously a significant feedstock shortage, which reduced producers’ ability to produce sufficient TiO₂. As a result, large consumers “lived off inventory,” a concept referred to as “destocking.” (Stern, Tr. 3714-15).

Response to Proposed Finding No. 92

The Proposed Finding relies on improper evidence in that it relies solely on the testimony of Mr. Stern, Respondents’ expert, for various factual propositions that should be established by fact witnesses or documents, not through expert testimony, and therefore should be disregarded by the Court. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). Moreover, Mr. Stern has little, if any, relevant experience or expertise in the TiO₂ industry specifically. (Stern, Tr. 3855-59; *see* CCRRFF ¶ 65, above).

93. Operating rates are an indication of global supply/demand balances because when demand for a product is strong, necessarily plant operating rates will be high—and the reverse is true as well. (Stern, Tr. 3712).

Response to Proposed Finding No. 93

The Proposed Finding is incomplete, misleading, factually inaccurate and contrary to the weight of the evidence to the extent that it infers that the operating rates of TiO₂ plants in North America always reflect global supply and demand conditions. Indeed, Dr. Hill showed that Respondents { [REDACTED]

{ [REDACTED] } (CCFF ¶¶ 595, 601, 605, 615, 619; PX5002 at 006, 008 (Figs. 1, 2, 3) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). Additionally, Respondents' offer only a conclusory statement from their hired expert, rather than facts or analysis, to show that plant operating rates are determined by "global supply/demand balances," rather than regional supply and demand.

94. TiO₂ prices and price cycles are influenced by numerous factors. Regional supply-demand balances affect TiO₂ prices. (Stern, Tr. 3717). Global exchange rates can also be the biggest factor that causes fluctuating gaps between prices by region, in large part because this is a "globally traded material." (Stern, Tr. 3718-19). Indeed, "the exchange rate has more impact on the price than the price itself." (Turgeon, Tr. 2672-73). "[T]he fluctuation in currency has a huge impact on our business." (Turgeon, Tr. 2672-73).

Response to Proposed Finding No. 94

The Proposed Finding is factually inaccurate, misleading, and contrary to the weight of the evidence as it grossly overstates the effect of exchange rates on TiO₂ prices and price cycles. The Proposed Finding is not supported by the material cited, as Mr. Stern did not testify anywhere on pages 3718 to 3719 that global exchange rates "can also be the biggest factor that causes fluctuating gaps between prices by region," nor could, as he did no analysis that would support such a conclusion. (Stern, Tr. 3718-19).

For several reasons, Mr. Turgeon is simply incorrect with regard to the unfounded and vague claim "the exchange rate has more impact on the price than the price itself." First, according to TZMI, an industry consulting firm relied upon by { [REDACTED] } (Engle, Tr. 2551; PX7043 (Gigou, Dep. at 031) (*in camera*)), TiO₂ prices are driven by "market fundamentals – supply and demand in the form of inventory, sales, and over- or under-supply conditions," rather than an "external factor[] such as . . . foreign exchange rates." (RX0225 at 020 (TZMI, TIO₂ Pigment Price Forecast to 2020)).

Second, consistent with TZMI's view, { [REDACTED]
[REDACTED] } For example,
{ [REDACTED]
[REDACTED] } (PX2154 (Cristal Pricing Model) (*in camera*)). { [REDACTED]
[REDACTED] } (PX7035 (Christian, Dep. at
81) (*in camera*)).

Third, many TiO2 plants supply customers in the same currency region and the related revenues and expenses associated with the sale are not subject to global exchange rates. { [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] }
(PX7025 (Malichky, Dep. at 109-10) (*in camera*)).

95. [REDACTED]
[REDACTED] Tronox's customers have successfully used pricing in one region to negotiate better pricing in another region. (Duvekot, Tr. 1341).

Response to Proposed Finding No. 95

This proposed finding of fact is factually inaccurate and contrary to the weight of the evidence. On the very page cited in the Proposed Finding, Mr. Moulard was asked by his own counsel: [REDACTED]
[REDACTED] }
(Moulard, Tr. 1281-82).

In addition, the statement "Tronox's customers have successfully used pricing in one region to negotiate better pricing in another region" is vague, and insofar as it purports to claim

that North American customers have used prices in other regions to lower prices in North America, it is inaccurate, not backed by *any* specific examples, and contrary to the weight of the evidence. (CCFF ¶¶ 177-78, 181). As Tronox’s Mr. Duvekot wrote in an email, { [REDACTED] } (CCFF ¶ 177; PX1456 at 001 (Duvekot email to Tan and Mouland) (*in camera*)). Mr. Duvekot also testified at his deposition that { [REDACTED] } (PX7026 (Duvekot, Dep. at 89) (*in camera*)).

Moreover, even large multinational customers like { [REDACTED] } (CCFF ¶ 178; Young, Tr. 673 (*in camera*); PX7020 (Young, Dep. at 70-71) (*in camera*)). { [REDACTED] } (CCFF ¶ 181; PX7040 (Santoro, Dep. at 193) (*in camera*)).

96. Although “there’s no specific timeline on how long [price cycles] last,” they typically last for “three to five years,” and “[s]ometimes it could be as long as six [years].” (Romano, Tr. 2224-25). The last TiO₂ price cycle began after the Great Recession of 2008-2009. (Stern, Tr. 3742). During the last TiO₂ price cycle, there was an effort to satisfy rapidly growing demand for TiO₂ following the Great Recession. That required reopening mines that satisfied the TiO₂ producers’ desires to get feedstock in order to make TiO₂ product. (Stern, Tr. 3742).

Response to Proposed Finding No. 96

The proposed finding is not relevant to the antitrust analysis. As discussed in the Response to Proposed Finding No. 86, whether there is a TiO₂ price cycle is not relevant to the analysis of the merger’s likely effects on incentives. (*See* CCRRFF ¶ 86, above).

Moreover, the second through the last sentences of the Proposed Finding rely on improper evidence in that it relies solely on the testimony of Mr. Stern, Respondents’ expert, for various factual propositions that should be established by fact witnesses or documents, not through expert

testimony, and therefore should be disregarded by the Court. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). As noted above, Mr. Stern has little, if any, relevant experience or expertise in the TiO₂ industry specifically. (Stern, Tr. 3855-59; *see* CCRRFF ¶ 65, above).

97. A lengthy down-cycle in the TiO₂ industry lasted from approximately 2011 through the beginning of 2016. (Turgeon, Tr. 2637). The TiO₂ price cycle peak in the first quarter of 2012 was caused by a fall in TiO₂ demand; feedstock prices were also escalating at a rapid rate. (Stern, Tr. 3744-45) TiO₂ customers responded to these price increases by curtailing purchases of TiO₂, and living off of their accumulated inventories. (Stern, Tr. 3745). Because of the reduction in demand in 2012, destocking took over, and that led to a deep reduction in TiO₂ prices through 2016. (Stern, Tr. 3745-46).

Response to Proposed Finding No. 97

The Proposed Finding of fact is incomplete, misleading, and not relevant to the antitrust analysis as discussed in the Response to the Proposed Findings Nos. 86 and 94. (*See* CCRRFF ¶¶ 86, 94, above). Additionally, the second through the last sentences of the Proposed Finding rely on improper evidence in that it relies solely on the testimony of Mr. Stern, Respondents' expert, for various factual propositions that should be established by fact witnesses or documents, not through expert testimony, and therefore should be disregarded by the Court. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). As noted above, Mr. Stern has little, if any, relevant experience or expertise in the TiO₂ industry specifically. (Stern, Tr. 3855-59; *see* CCRRFF ¶ 65, above).

Further, it is important to note how Tronox responded to the down cycle that began in 2011. For example, when Mr. Casey asked Mr. Romano in 2011 to explain {

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED] } (PX1090 at 001 (Romano email to Casey) (emphasis added) (*in camera*);
 CCF ¶ 434).

In a similar July 2012 email, Mr. Romano wrote to Mr. Casey, then-CEO of Tronox and
 Mr. Greenwell, then-CFO that: { [REDACTED]

[REDACTED]
 [REDACTED]
 [REDACTED] } (PX1015 at 001
 (Romano email to Casey and Greenwell) (*in camera*); Romano, Tr. 2161-63 (*in camera*); CCF ¶
 435). Not only did Mr. Romano make this point to Mr. Casey several times in 2011 and 2012, but
 so did Mr. Wayne Hinman, a member of the Tronox Board of Directors: { [REDACTED]

[REDACTED]
 [REDACTED]
 [REDACTED] } (PX1075 at 001 (Hinman email to Casey) (*in*
camera); CCF ¶ 436)). Similar to the observation by Mr. Romano, an October 2011 presentation
 by Cristal's Mr. Stoll to Cristal's Steering Body illustrates that Cristal's view at that time on
 reducing price was in line with Tronox's: "The '*Evil Sin*' would be to attempt to lower prices to
 take market share as markets weaken. *We Must Hold Price!*" (PX2242 at 017 (Cristal Steering
 Body Meeting Commercial Update) (emphasis in original); Stoll, Tr. 2086; PX7009 (Stoll, Dep.
 at 146-47) (*in camera*); see also CCF ¶¶ 433-40, 443-47).

98. The price cycle reached its bottom (or "trough") at the end of 2015, first quarter of
 2016. (Stern, Tr. 3746). During the trough at the end of 2015, and into the first quarter of 2016,

TiO₂ producers struggled to cover cash costs at soft price levels. Several of the producers had their financial status downgraded. (Stern, Tr. 3746). The market situation in 2015 was particularly poor. In 2015, market prices for TiO₂ were at their lowest point in at least the preceding 28 years. (Turgeon, Tr. 2638). At the time, Tronox was running its plants “at cost”; there was an “oversupply of material”; global demand had “collapsed”; and Tronox’s inventory levels were “very high.” (Turgeon, Tr. 2637).

Response to Proposed Finding No. 98

The Proposed Finding of fact is incomplete, misleading, and not relevant to the antitrust analysis as discussed in the Response to the Proposed Findings Nos. 86 and 94. (*See* CCRRFF ¶¶ 86, 94, above). Additionally, the first three sentences of the Proposed Finding rely on improper evidence in that it relies solely on the testimony of Mr. Stern, Respondents’ expert, for various factual propositions that should be established by fact witnesses or documents, not through expert testimony, and therefore should be disregarded by the Court. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). As noted above, Mr. Stern has little, if any, relevant experience or expertise in the TiO₂ industry specifically. (Stern, Tr. 3855-59; *see* CCRRFF ¶ 65, above).

It is also important to note that Tronox responded to those supposed conditions by announcing supply reductions with the anticipation that it would lead other chloride TiO₂ suppliers to do the same thus leading to an increase in prices. First, as demand waned in the period after 2012, Tronox continued to make efforts to maintain pricing by pulling back on competing aggressively to maintain sales volumes. (CCFF ¶¶ 450-59; *see* CCRRFF ¶ 97, above). Tronox and Cristal documents indicate that companies make TiO₂ production decisions that support higher TiO₂ prices. (CCFF ¶¶ 428-32).

99. The continuing decline in TiO₂ prices between 2012 and 2016 demonstrates that, in the face of output reduction by suppliers, TiO₂ supply still “outstripped demand, leading to a weak pricing environment and producers who were struggling to reduce supply by trying to reduce inventory.” (Stern, Tr. 3771).

Response to Proposed Finding No. 99

The Proposed Finding should be disregarded by the Court because the Proposed Finding rely on improper evidence in that it relies solely on the testimony of Mr. Stern, Respondents' expert, for various factual propositions that should be established by fact witnesses or documents, not through expert testimony. (See June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). As noted above, Mr. Stern has little, if any, relevant experience or expertise in the TiO₂ industry specifically and thus, lacks the foundation necessary to analyze whether producers were struggling to reduce supply by trying to reduce inventory. (Stern, Tr. 3855-59; see CCRRFF ¶ 65, above).

Moreover, the proposed finding is incomplete and misleading. In 2011 and 2012 when prices were high, Tronox was already reducing output to maintain prices. { [REDACTED] [REDACTED] [REDACTED] [REDACTED] } (PX1075 at 001 (Hinman/Casey email chain) (*in camera*)). Cristal also took capacity offline during that time. (CCFF ¶ 580).

In 2015 before prices begin to rise in early 2016, Tronox made repeated public statements that it withholds TiO₂ from the North American market to affect price. (PX9003 at 010-11 (Tronox Q1 2016 Earnings Call); PX9005 at 009-10 (Tronox Q3 2015 Earnings Call); PX9007 at 005 (Tronox Q2 2015 Earnings Call)). For example, in a 2015 earnings call, Mr. Casey, then CEO of Tronox, observed that Tronox is “managing [its] production so that inventories get reduced to normal or below normal levels. And when that happens price will rise... From what we see with Chemours and Huntsman and presumably the others as well, they’re doing the same thing. We see them acting in the same way.” (PX9005 at 010 (Tronox Q3 2015 Earnings Call); see also CCFF ¶¶ 569-85).

III. THE TRONOX-CRISTAL ACQUISITION WILL GENERATE SIGNIFICANT OUTPUT-ENHANCING AND COST-SAVING SYNERGIES.

100. “[T]he proposed transaction will lead to significant output-enhancing efficiencies” at both the pigment level (i.e., production of TiO₂) and at the feedstock level, as well as “significant cost reductions.” (Shehadeh, Tr. 3441-42; Quinn, Tr. 2363-64).

Response to Proposed Finding No. 100

The Proposed Finding is vague as to the meaning of the term “significant.” It is also incomplete in that it fails to quantify any purported “output-enhancing efficiencies” at either the pigment or feedstock level, or any “cost reductions.” Moreover, Dr. Shehadeh’s testimony that the proposed acquisition “will” lead to output-enhancing efficiencies should be given little weight because, as he acknowledged, he lacks the technical expertise to evaluate whether Tronox will improve performance at Yanbu, implement best practices, or commission the Jazan facility. (Shehadeh, Tr. at 3610-12). The Proposed Finding is also incomplete in that it fails to address the key question of whether the claimed synergies cognizable within the meaning of the Horizontal Merger Guidelines (i.e., verifiable, merger-specific, and not arising out of competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines, § 10)). It is also contrary to the weight of the evidence, which shows that in many cases the claims lack foundation or rely on unfounded assumptions or unverifiable business judgment, and that there appear to be practical alternatives other than the proposed acquisition for achieving a number of the claimed synergies. (CCFF ¶¶ 842-1017).

The Proposed Finding is also incomplete in that it fails to address any benefits specifically to North American chloride TiO₂ customers. As Dr. Shehadeh himself acknowledged, Cristal does not currently ship any chloride TiO₂ to North American customers from the Yanbu plant. (Shehadeh, Tr. 3610). Indeed, Mr. Quinn acknowledged that the claimed operational synergies, including those related to Yanbu and Jazan, are for the most part “ex-U.S.” (Quinn, Tr. 2406-08).

101. The transaction’s output-enhancing efficiencies will create an increase of TiO₂ in the global market. (Shehadeh, Tr. 3443). This will occur at both the TiO₂ pigment and feedstock levels:

- a. At the TiO₂ pigment level, increasing TiO₂ production at the Yanbu plant and “application of best practices across the combined” company post-merger “will lead to output-expanding efficiencies in pigment.” (Shehadeh, Tr. 3442). The increase in global supply of TiO₂ will have a “direct effect” in terms of “customer[] benefit.” (Shehadeh, Tr. 3442-43).
- b. At the TiO₂ feedstock level, output-expanding efficiencies will both “enhance the incentives of the postmerger Tronox to expand output of pigment” as well as “free up” additional sources of feedstock supply “for other competitors,” thereby increasing total pigment production and total feedstock supply in the market. (Shehadeh, Tr. 3444). The resulting increased output of TiO₂ pigment in the global market will also have a “direct effect” in terms of “customer[] benefit.” (Shehadeh, Tr. 3443).

Response to Proposed Finding No. 101

The Proposed Finding is vague in that it fails to quantify any purported benefits or to specify which customers will benefit. Moreover, Dr. Shehadeh’s testimony that the Yanbu synergy “will” occur should be given little or no weight because, as Dr. Shehadeh admitted, he has no technical expertise to assess whether Tronox will be able to improve operations at the Yanbu plant, (Shehadeh, Tr. 3610-11), or at any plant through applying best practices, (Shehadeh, Tr. 3611-12). Nor should the Court give weight to his testimony that feedstock synergies “will” occur, because Dr. Shehadeh admitted that he has no expertise to opine on whether Tronox will be able to successfully commission the Jazan Slagger. (Shehadeh, Tr. 3612-13). The Proposed Finding is also incomplete in that it fails to address the key question of whether the claimed synergies related to pigment and feedstock output are cognizable within the meaning of the Horizontal Merger Guidelines (i.e., verifiable, merger-specific, and not arising out of competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines, § 10)). It is also contrary to the weight of the evidence, which demonstrates that those synergies are not cognizable. (CCFF ¶¶ 842-948). The Proposed Finding is also contrary to Tronox’s own experience, in that after becoming vertically integrated in 2012, Tronox on multiple occasions actually reduced its output both at the feedstock

and pigment levels, fully aware of the likely impact it would have on prices. (CCFF ¶¶ 994-1002).

Further, in the company's 2017 strategic plan, Tronox { [REDACTED] } (PX1091 at 055 (Tronox TiO2 2017 Strategic Plan) (*in camera*)). In contrast, { [REDACTED] } (PX1091 at 023 (Tronox TiO2 2017 Strategic Plan) (*in camera*)).

The Proposed Finding is also incomplete in that it fails to address any benefits specifically to North American chloride TiO2 customers. As Dr. Shehadeh himself acknowledged, Cristal does not currently ship any chloride TiO2 to North American customers from the Yanbu plant. (Shehadeh, Tr. 3610). Indeed, the Tronox CEO acknowledged that the claimed operational synergies, including those related to Yanbu and Jazan, are for the most part “ex-U.S.” (Quinn, Tr. 2406-08).

102. The significant cost-saving efficiencies from the transaction will further “increase[] the incentives of the postmerger firm to expand output and, as a result,” cause an “incentive to supply more to its customers, to the benefit of those customers.” (Shehadeh, Tr. 3444-45).

Response to Proposed Finding No. 102

The Proposed Finding is vague in that it fails to quantify the impact of any cost savings on the incentive to supply customers, and fails to address whether any of the customers it claims will benefit are North American chloride TiO2 customers. In addition, it is misleading and contrary to the weight of the evidence. Specifically, since becoming vertically integrated via its acquisition of Exxaro, Tronox has on multiple occasions reduced its production of both feedstock and TiO2 pigment. (CCFF ¶¶ 994-1002).

103. “The expected transaction synergies will increase Tronox’s production capacity and lower its costs, increase Tronox’s ability to compete, including against growing Chinese competition.” (Stern, Tr. 3704-05).

Response to Proposed Finding No. 103

The Proposed Finding is vague in that it fails to quantify any impact of the proposed acquisition on capacity or costs, and fails to specify the geographic scope of any such impact. It is also incomplete in that it fails to address the issue of whether the expected synergies are cognizable under the Horizontal Merger Guidelines. Mr. Stern's testimony should be given little weight because, as he admits, he did not independently verify the magnitude of Respondents' claimed synergies or determine if any of them were merger-specific. (Stern, Tr. 3879). Dr. Zmijewski did review and analyze Respondents' synergy claims under the Horizontal Merger Guidelines, and ultimately found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had not demonstrated that the claims are merger specific. (CCFF ¶¶ 830-32). In addition, the Proposed Finding fails to cite evidence of any "growing Chinese competition." On the contrary, Mr. Stern acknowledged that the presence of Chinese TiO₂ in North America is extremely limited—approximately 91,000 metric tons in 2016—only 11% of which was chloride TiO₂. (Stern, Tr. 3873). In fact, imports of chloride TiO₂ from all producers in China account for { [REDACTED] } of the North American market for chloride TiO₂. (CCFF ¶ 755). The weight of the evidence demonstrates that entry or expansion by Chinese producers would not be timely, likely, or sufficient to counteract the likely competitive harm of the proposed acquisition. (CCFF ¶¶ 745-812).

104. One of the "primary drivers" of the transaction is to permit Tronox to increase production and output of TiO₂. (Romano, Tr. 2216-17). The purpose of the transaction is to "get additional volume" from the post-merger firm's TiO₂ plants by applying "operational excellence" principles across the post-merger pigment plants. (Romano, Tr. 2216-17).

Response to Proposed Finding No. 104

The Proposed Finding is vague as to the meaning of the term "operational excellence," and vague in that it fails to identify the relevant plants, quantify the "additional volume" that it claims

each plant will produce by applying such principles, or cite evidence that any increased volumes would benefit chloride TiO₂ customers in North America. In addition, Mr. Romano’s testimony should be given little weight because it is contrary to the weight of the evidence, which suggests that Tronox will have a greater ability and incentive to curtail capacity post-acquisition. (CCFF ¶¶ 551-694). Moreover, the Proposed Finding is incomplete in that it fails to address the issue of whether any anticipated additional volume from applying “best practices” is cognizable under the Horizontal Merger Guidelines. As the weight of the evidence demonstrates, Respondents’ claimed synergy of applying best practices across TiO₂ plants is neither verifiable nor merger specific. (CCFF ¶¶ 933-940).

Finally, the Proposed Finding is misleading to the extent it suggests that the proposed transaction does not make financial sense for Tronox in the absence of getting “additional volume.” On the contrary, Dr. Zmijewski reviewed { [REDACTED] } (Zmijewski, Tr. 1476-78 (*in camera*); PX5001 at 033-36 (¶¶ 45-49) (Zmijewski Initial Report) (*in camera*)).

105. The transaction will also allow Tronox “to be able to service our customers better.” (Romano, Tr. 2216). Tronox “need[s] to get bigger” in order to “be able to continue to support the growth of those very large customers that continue to consolidate.” (Romano, Tr. 2216-17). By increasing Tronox’s size and production volume, Tronox will increase its “ability to serve globally.” (Romano, Tr. 2216-17).

Response to Proposed Finding No. 105

The Proposed Finding begins with a misleading citation to Mr. Romano, who stated that an objective of the proposed merger is to service customers better—not that the acquisition will allow Tronox to service customers better. (Romano, Tr. 2216-17) Further, the Proposed Finding is premised on vague and conclusory opinion of Mr. Romano that Tronox needs to be “bigger” in

order to service large customers, although he did not identify any specific aspects of how being bigger would allow Tronox to “support the growth” of these customers. (Romano, Tr. 2216-17). To the extent that Mr. Romano described potential increases in output of the combined company, his involvement with respect to the Proposed Acquisition has primarily been on the [REDACTED] [REDACTED] },” (PX7001 (Romano, IHT at 22) (*in camera*)), while his involvement in integration efforts has been { [REDACTED] }. (PX7001 (Romano, IHT at 22-23) (*in camera*)). Therefore, the foundation for and reliability of his opinion is limited.

In any event, Mr. Romano’s opinions are contradicted by the testimony of several TiO₂ customers who testified at trial as to their concerns that the proposed acquisition would lead to reduced competition in the supply of chloride TiO₂ in North America. (CCFF ¶¶ 714-20). Mr. Romano’s opinions are also contradicted by his statements directly to PPG that Tronox would be increasing TiO₂ prices to PPG. (CCFF ¶¶ 708-10). Tronox chose not to call as witnesses any TiO₂ customers who would testify to their expectations that the combined company would provide them with improved service.

106. Total synergies from the transaction are conservatively estimated to be between \$200 and \$250 million of annualized value. (Quinn, Tr. 2329; PX0010; Mancini, Tr. 2816). Tronox publicly communicated to the market a realization of \$100 million of EBITDA synergies by the end of year 1, and \$200 million by the end of year 3. (Mancini, Tr. 2800). The synergy estimates are “valuable” and are “conservative estimate”; “[t]he natural tendency is to be conservative . . . because you want to make sure that the deal makes financial sense.” (Quinn, Tr. 2329, 2341-42). It was “conveyed to the board that” the synergies were a “conservative estimate” and “risk-adjusted” such that “there might be more upside than” the value estimated.¹⁶ (Quinn, Tr. 2329; PX0010). By delivering on the synergies, Tronox will create value for shareholders that is “very significant.” (Quinn, Tr. 2331-32; PX0010-0173).

¹⁶ As described by Mr. Quinn, “Tronox is . . . a public company, and when you announce a deal like this, one of the things it’s really great to do is meet expectations and raise them and meet expectations.” “It’s prudent to be conservative in initial estimates.” (Quinn, Tr. 2330; PX0010). It is important to be sure that Tronox can attain the synergies because, “there’s lots of consequences if you don’t, especially on . . . the financing side and delivering those to the satisfaction of your banks.” (Quinn, Tr. 2342-43; PX0010). It is also important to be sure that Tronox can attain the synergies so that management remains credible before the board and investors. (Quinn, Tr. 2342-43; PX0010).

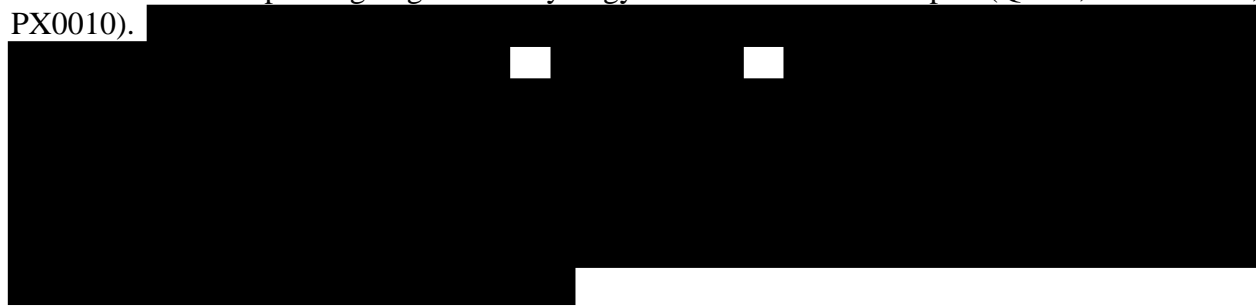
Response to Proposed Finding No. 106

The Proposed Finding is vague as to the meanings of the terms “valuable” and “conservative.” It is also misleading and incomplete in that it fails to address the relevant issue under the Horizontal Merger Guidelines—whether the announced, or “conservative,” synergies are cognizable, that is, verifiable, merger-specific, and not arising from competitive harm. (PX9085 at 033 (Horizontal Merger Guidelines)). In fact, Respondents’ claimed synergies in many cases lacked foundation or relied on unfounded assumptions or unverifiable business judgment; in addition there appear to be practical alternatives other than the proposed acquisition for Respondents to achieve a number of the claimed synergies. (CCFF ¶¶ 842-1017). Accordingly, upon reviewing and analyzing Respondents’ synergy claims under the Horizontal Merger Guidelines, Dr. Zmijewski ultimately found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had not demonstrated that the claims are merger specific. (CCFF ¶¶ 830-32). Specifically with respect to the “risk-adjust[ment]” of synergies, Dr. Zmijewski testified that the risk adjustment itself “would have to be verifiable and merger-specific. On verifiable, how do you distinguish between 20 percent, 30 percent, 50 percent, 90 percent, 100 percent? How do you distinguish between those numbers? You need foundation. If you don’t have foundation, it’s an arbitrary calculation that doesn’t have foundation.” (Zmijewski, Tr. 1520). Respondents cite no expert analysis to support the assertion that any risk-adjustments are verifiable.

Finally, the Proposed Finding is misleading in that the creation of “value for shareholders” is not relevant to the analysis of cognizability under the Horizontal Merger Guidelines. As Dr. Zmijewski explained, “[i]nvestors and banks have a completely different approach than the Government. . . . [M]y understanding from the Merger Guidelines, the Government does care about

how [synergies] create value, and . . . efficiencies have to be cognizable to offset competitive harm. That's very different from how investors view these things.” (Zmijewski, Tr. 1573-74).

107. The fact that the synergy estimates are conservative has been borne out by confirmatory, post-signing due diligence. Tronox has continued to do confirmatory due diligence after the announcement of the transaction. (Mancini, Tr. 2762). “As the parties engaged in more detailed discussion post-signing . . . the synergy numbers . . . moved up.” (Quinn, Tr. 2341-42; PX0010).



Response to Proposed Finding No. 107

The Proposed finding is vague as to the meaning, nature, or significance of the terms “due diligence” or “pressure test” or how they relate to the key question under the Horizontal Merger Guidelines of whether the claimed synergies are cognizable (i.e., verifiable, merger-specific, and not arising from competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines)). It is also vague in that it fails to quantify the amount Tronox now expects for each type of anticipated synergy or to identify the basis for any such amounts. Respondents cite no expert analysis of any more recent “pressure testing” or synergies estimates, much less any analysis that concludes that such estimates are cognizable under the Horizontal Merger Guidelines. In fact, Respondents’ claimed synergies in many cases lacked foundation or relied on unfounded assumptions or unverifiable business judgment; in addition there appear to be practical alternatives other than the proposed acquisition for Respondents to achieve a number of the claimed synergies. (CCFF ¶¶ 842-1017). Accordingly, upon reviewing and analyzing Respondents’ synergy claims under the Horizontal Merger Guidelines, Dr. Zmijewski ultimately found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had not

demonstrated that the claims are merger specific. (CCFF ¶¶ 830-832). The Proposed Finding cites no evidence that undercuts those opinions.

108. Tronox has “a very high level of confidence” in its ability to achieve the announced synergies. (Mancini, Tr. 2805-06). In particular, Tronox “has an extraordinarily high level of confidence in [its] ability to deliver and exceed the specific synergies with respect to Yanbu and Jazan.” (Mancini, Tr. 2795).

Response to Proposed Finding No. 108

The Proposed Finding is vague as to the meaning or significance of the term “confidence,” and incomplete in that it fails to address the relevant issue under the Horizontal Merger Guidelines—whether the announced synergies are cognizable, that is, verifiable, merger-specific, and not arising from competitive harm. (PX9085 at 033 (Horizontal Merger Guidelines)). Dr. Zmijewski did review and analyze Respondents’ synergy claims under the Horizontal Merger Guidelines, and ultimately found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had not demonstrated that the claims are merger specific. (CCFF ¶¶ 830-32). The Proposed Finding is also incomplete in that it fails to acknowledge that { [REDACTED] [REDACTED] [REDACTED] } (PX0006 at 005 (KPMG Report) (*in camera*); CCFF ¶¶ 936, 955, 959, 969). Specifically with respect to the claimed synergies related to Yanbu and Jazan, the Proposed Finding is contrary to the weight of the evidence. (CCFF ¶¶ 842-87).

109. Tronox’s “combination of the skill-set and the experience to operate Yanbu and the skill-set to operate [the] Jazan smelter are both . . . unique, [and] to have both of those houses in the same company is . . . one of a kind.” (Quinn, Tr. 2357-59).

Response to Proposed Finding No. 109

The Proposed Finding is vague as to the meanings of the terms “unique” and “one of a kind,” and in any event fails to cite any evidence supporting the claim that such combination of

skill-set and experience is “unique” or “one of a kind.” It fails to cite evidence with respect to skill sets or experience outside of Tronox, and it fails to establish that Mr. Quinn even has foundation to speak to any such evidence. For these reasons, the testimony should be given little weight. Mr. Quinn had “no role in terms of specifically conducting diligence” and was not personally involved in developing the original synergy estimates in connection with the proposed acquisition. (Quinn, Tr. 2368-69). Moreover, the Yanbu and Jazan facilities are among the operational synergies that are “ex-U.S.” (Quinn, Tr. 2406-08). In any event, the weight of the evidence demonstrates that the Yanbu improvement synergy is not cognizable under the Horizontal Merger Guidelines, (CCFF ¶¶ 842-87), nor is the Jazan synergy, (CCFF ¶¶ 888-932).

110. Tronox conducted extensive due diligence visits to a number of Cristal plants, including Tikon, Bunbury, Yanbu, Thann, Stallingborough, Ashtabula I and Ashtabula II, as well as the Paraiba mine and the Bahia plant in Brazil. (Mancini, Tr. 2763-64).

Response to Proposed Finding No. 110

The Proposed Finding is vague as to the meaning, nature, or significance of the term “due diligence.” It is also incomplete in that it fails to address the relevant issue under the Horizontal Merger Guidelines—whether the announced synergies are cognizable, that is, verifiable, merger-specific, and not arising from competitive harm. (PX9085 at 033 (Horizontal Merger Guidelines)). In fact, Respondents’ claimed synergies in many cases lacked foundation or relied on unfounded assumptions or unverifiable business judgment; in addition there appear to be practical alternatives other than the proposed acquisition for Respondents to achieve a number of the claimed synergies. (CCFF ¶¶ 842-1017). Accordingly, upon reviewing and analyzing Respondents’ synergy claims under the Horizontal Merger Guidelines, Dr. Zmijewski ultimately found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had

not demonstrated that the claims are merger specific. (CCFF ¶¶ 830-32). The Proposed Finding cites no evidence that undercuts those opinions.

111. Tronox performed due diligence work for the Tronox-Cristal transaction in stages. (Mancini, Tr. 2756).

Response to Proposed Finding No. 111

The Proposed Finding is vague as to the meaning, nature, or significance of the term “due diligence.” It is also incomplete in that it fails to explain the relevance of performing any due diligence in stages. It is also incomplete in that it fails to address the relevant issue under the Horizontal Merger Guidelines—whether the announced synergies are cognizable, that is, verifiable, merger-specific, and not arising from competitive harm. (PX9085 at 033 (Horizontal Merger Guidelines)). In fact, Respondents’ claimed synergies in many cases lacked foundation or relied on unfounded assumptions or unverifiable business judgment; in addition there appear to be practical alternatives other than the proposed acquisition for Respondents to achieve a number of the claimed synergies. (CCFF ¶¶ 842-1017). Accordingly, upon reviewing and analyzing Respondents’ synergy claims under the Horizontal Merger Guidelines, Dr. Zmijewski ultimately found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had not demonstrated that the claims are merger specific. (CCFF ¶¶ 830-32). The Proposed Finding cites no evidence that undercuts those opinions.

A. The Transaction Will Generate Substantial Efficiencies from Enhancing Tronox’s Vertical Integration.

112. Tronox’s business model is based on vertical integration. (Van Niekerk,¹⁷ Tr. 3901-02). Vertical integration is Tronox’s “competitive advantage” and gives Tronox “competitive strength.” (Turgeon, Tr. 2601-02).

¹⁷ Dr. Van Niekerk has extensive experience in the field of pyrometallurgy, with 15-20 years of hand-on experience and later transitioning to the management side. (Van Niekerk, Tr. 3903-06). Pyrometallurgy is “the chemistry or the metallurgy that takes place at elevated temperatures.” (Van Niekerk, Tr. 3903). Dr. Van Niekerk also received a degree in commerce at the University of South Africa and attended The Management College in the U.K. which is now called Brunel University. (Van Niekerk, Tr. 3902-03).

Response to Proposed Finding No. 112

The Proposed Finding is vague, incomplete and misleading. Mr. Van Niekerk did state that Tronox's business model is based on vertical integration. Mr. Turgeon described vertical integration to be a source of competitive advantage or strength for Tronox. What neither Mr. Van Niekerk nor Mr. Turgeon addressed, though, is what Tronox's vertical integration had meant in practice. As Complaint Counsel has described, Tronox, since the acquisition of Exxaro, has idled both feedstock and pigment capacity, absorbing what it has described to be high fixed costs for both products. Further, it has tended to set relatively prices for TiO₂. (CCFF ¶¶ 994-99).

113. "Tronox currently is fully vertically integrated." (Van Niekerk, Tr. 3901-02). Tronox is "long" on feedstock. This means Tronox has more feedstock than is necessary to supply its TiO₂ pigment plants. (Turgeon, Tr. 2601-03). Tronox has "too much feedstock for [its] own consumption." (Van Niekerk, Tr. 3901-02). Tronox attempts to sell its excess feedstock. (Turgeon, Tr. 2601-02). However, because purchasers of TiO₂ feedstock are all direct competitors to Tronox in the TiO₂ pigment industry, Tronox often has difficulty selling its TiO₂ feedstock. If Tronox cannot sell its excess feedstock, it simply gets stockpiled at a facility. (Turgeon, Tr. 2601-03). Tronox is currently "about 200,000 tons of feedstock long." (Van Niekerk, Tr. 3901-02).

Response to Proposed Finding No. 113

The Proposed Finding is vague, incomplete, and misleading. Cristal does not lack the feedstock necessary to operate its pigment plants—it sources that feedstock from outside suppliers. (PX7009 (Stoll, Dep. at 60) (*in camera*)). To the extent that the Proposed Finding suggests that Cristal is not able to operate its pigment plants, that is misleading.

The Proposed Finding is misleading and incomplete to the extent that it implies that Tronox has an established strategy to sell to third parties feedstock that it does not use internally. As Complaint Counsel has described, Tronox internal documents make it evident that Tronox has made decisions not to sell feedstock to pigment producers, specifically in order to generate higher

prices for feedstock. (CCFF ¶¶ 996-97, 1001-02). { [REDACTED] }
 (Christian, Tr. 802-04 (*in camera*)).

The Proposed Finding is also misleading and incomplete to the extent that it implies that feedstock that Tronox does not use “simply gets stockpiled.” Tronox has a range of options to use feedstock, including selling it to third parties, or using its supply of feedstock to increase pigment production, as an array of documents suggest it has planned to do and could do in the future. (CCFF ¶¶ 1003-10). In other words, the “long” position in feedstock suggests that Tronox has the capability to take advantage of what it has described to be its “competitive advantage” and “competitive strength” and increase pigment production.

Finally, the Proposed Finding is incomplete and misleading in its reference to Tronox being about 200,000 tons long in feedstock. What Tronox does not disclose is that there is a significant discrepancy between high grade feedstock for chloride TiO₂, and ilmenite feedstock for sulfate TiO₂. { [REDACTED] }
 { [REDACTED] }. (PX0010 at 219 (Tronox February 2017 Board of Directors Presentation) (*in camera*)).

114. Cristal, by contrast, is currently “feedstock short.” (Turgeon, Tr. 2604). Because “Cristal is short on feedstock . . . they don’t have enough to supply” their pigment plants. (Stoll, Tr. 2111; Turgeon, Tr. 2604). This is why Tronox wants to complete the transaction with Cristal. (Turgeon, Tr. 2603-04). “[T]he acquisition of Cristal provides a better balance between feedstock availability and feedstock requirements to make TiO₂, because Cristal is feedstock short.” (Stern, Tr. 3851). “Tronox has excess feedstock capacity that can be used by the Cristal plants. (Stoll, Tr. 2111).

Response to Proposed Finding No. 114

The Proposed Finding is vague, incomplete and misleading. Cristal has access to the feedstock that it needs to operate its pigment plants – but at present, instead of producing that feedstock internally, it sources it from producers such as Rio Tinto and Iluka and Tronox. For

example, Mr. Stoll was asked whether Cristal “produces” enough feedstock to supply its pigment plants, to which he responded that they did not. (Stoll, Tr. 2111). He did not imply, as this Proposed Finding suggests, that they do not have access to an adequate supply of feedstock to operate their pigment plants.

To the extent that the Proposed Finding implies that the increased vertical integration is “why Tronox wants to compete the transaction with Cristal,” it is incomplete because it fails to disclose that Tronox documents describe {

} (PX0010

at 176 (Tronox Board Presentation) ({ } (in camera)). Another reason for the Proposed Acquisition, as Tronox described to Moody’s, is that it would lead to increased pricing “discipline” in downturns. (PX1407 at 005 (Moody’s Report) (“Continuing consolidation in the TiO₂ industry bodes well for future discipline among producers, and therefore industry pricing cycles. Tronox’s February 2017 deal to buy Saudi-based producer Cristal and Huntsman’s separation of its pigment business will leave only four major western TiO₂ producers—Tronox, Chemours, Venator Materials and Kronos Worldwide.”); PX1408 at 005 (Moody’s Report); PX4220 at 004 (Moody’s Press Release) (“While [Tronox] management has commented that the next downturn likely will be less severe due to more disciplined behavior by industry participants under new ownership, the rating assumes conservatively that the next downturn could approach similar severity.”); *see also* CCF 705-07 (Cristal and Tronox documents projecting that industry consolidation and the proposed acquisition would benefit Tronox and other TiO₂ producers and would lead to higher TiO₂ prices)).

Further, the Proposed Finding, referring to Tronox “has excess feedstock,” does not disclose that Tronox {

{ [REDACTED] }. (PX0010 at 219 (Tronox February 2017 Board Presentation) (*in camera*)). The Proposed Finding also does not account for the opportunities for Tronox to use its internally produced feedstock to produce increased amounts of pigment. As Complaint Counsel has described, this potential is recognized in Tronox’s own recent strategic plans. (CCFF ¶¶ 1003-1010).

Finally, to the extent that this Proposed Finding is premised on Cristal not making the Jazan Slagger operational, Respondents have not established that Cristal would not. { [REDACTED]

[REDACTED] } (CCFF ¶ 925; *see generally* CCFF ¶¶ 909-32 (discussing { [REDACTED] })). Even after the acquisition was announced, Cristal has continued to invest in the Jazan Slagger to address operational issues. (CCFF ¶¶ 928, 931).

115. After the transaction, Tronox will be able to use all of its excess feedstock to supply the current Cristal TiO₂ pigment plants. (Turgeon, Tr. 2604). The combined entity will still be somewhat short on feedstock and will still need to purchase some feedstock on the market. (Turgeon, Tr. 2604). This is a more “ideal situation” because Tronox “won’t have to compete with feedstock producer to try to sell ilmenite or to sell slag because we will use all that we could produce for ourselves.” (Turgeon, Tr. 2604). Instead, it will be a customer of feedstock producers “when the market is really good and the demand’s good,” but “when the market goes down and the demand is not as good, we will still be able to run those feedstock assets at full rates.” (Quinn, Tr. 2361-62).

Response to Proposed Finding No. 115

The Proposed Finding is vague and incorrect in its implication that refers to “excess” feedstock. The term “excess feedstock” implies that Tronox cannot use feedstock, but Tronox has opportunities to increase its pigment production and use more feedstock internally. It may be the case that Tronox would find it an “ideal situation” not to have to compete to sell ilmenite or slag. As Complaint Counsel has described, Tronox at times has chosen to reduce production of chloride

slag rather than compete at the price levels that would have been required to sell that slag. (CCFF ¶¶ 996-98, 1001-02).

Further, the Proposed Finding refers to Tronox purchasing feedstock from third parties when the market is good, but using only its internally produced feedstock at times when “the market goes down.” However, as Tronox’s Board presentation reveals, the combined company, immediately after the acquisition, { [REDACTED] } [REDACTED]. (PX0010 at 219 (Tronox February 2017 Board Presentation) (*in camera*)). Thus, the combined company will have a need to purchase substantial amounts of high grade feedstock from third parties.

Finally, the Proposed Finding is vague, because it spans a range of conditions that Tronox could describe as “down” for pigment. To the extent that it suggests though, that there would be times that Tronox would need to purchase feedstock to runs its pigment plants, but other times that its own feedstock production would be sufficient to run its pigment plants, this finding implicitly admits that Tronox would intend in the future to reduce production of TiO₂ (since the only way it would not need additional feedstock when the market is “down” is it would be producing less TiO₂ pigment). This admission is to one of the competitive concerns raised by the Commission in this case. (*See* Administrative Complaint, ¶ 51).

116. Because post-merger Tronox “will be able to use that excess feedstock that we have to feed those pigment plant[s],” the combination between Tronox and Cristal is a “perfect fit.” (Turgeon, Tr. 2604).

Response to Proposed Finding No. 116

The Proposed Finding is vague and contrary to the weight of the evidence. As Tronox’s Board presentation for the Cristal acquisition shows, Tronox presently is only slightly “long” in the high-grade feedstock required for chloride TiO₂ plants, { [REDACTED] } (PX0010 at

219 (Tronox February 2017 Board Presentation) (*in camera*)). This Board presentation reveals that the combined entity will after the acquisition { [REDACTED] [REDACTED] }. (PX0010 at 219 (Tronox February 2017 Board Presentation) (*in camera*)).

Further, as described above in Response to Proposed Findings 113 and 114 (*see* CCRFF ¶¶ 113-14, above), Tronox has not established that it does not have practical opportunities to use its internally produced feedstock in its pigment operations, and indeed, its internal planning documents provide substantial evidence of those opportunities. (CCFF ¶¶ 1003-10).

Finally, the reference to the combination of Tronox and Cristal being a “perfect fit,” simply describes the vague and conclusory opinion of Mr. Turgeon, is contrary to the factual evidence, and should be given no weight.

117. Vertical integration eliminates one or two levels of margins from the production costs of TiO₂ pigment—the feedstock producer’s margin, and if the feedstock producer did not have its own source of ilmenite (a key raw material), the margin from the mine owner. (Shehadeh, Tr. 3420-21).

Response to Proposed Finding No. 117

The Proposed Finding is incomplete, vague and overbroad. Tronox has provided no detail regarding the margins that it asserts are eliminated as a result of vertical integration, the additional organization costs that a vertically integrated firm incurs, or how increased vertical integration would lead to increased TiO₂ output or lower pricing. Further, besides the general observation, Tronox provided no information relating to the practical impact that vertical integration has had as it relates to TiO₂. Tronox became a vertically integrated producer of TiO₂ after the Exxaro acquisition, yet since that acquisition Tronox has reduced production of both TiO₂ feedstock and pigment, and tends to support efforts to increase TiO₂ pricing, at times by choosing not to compete for sales. (CCFF ¶¶ 527-36, 595-612, 996-98, 1001-02).

of both feedstock and pigment. (CCFF ¶¶ 595-612, 996-98, 1001-02). Further, it has regularly avoided competitive situations for pigment, choosing to take steps to preserve pigment pricing at higher levels than it otherwise would have to. (CCFF ¶¶ 527-36). Further, Tronox has had and absent the acquisition will continue to have opportunities to make pro-competitive expansions of its pigment production in order to increase its level of vertical integration, using its secret sauce to the benefit of TiO₂ consumers.

In any event, the combined company, immediately after the proposed acquisition, {
 }.

(PX0010 at 219 (Tronox February 2017 Board Presentation) (*in camera*)).

120. As a result, there are “[s]ignificant” cost advantages to vertical integration of feedstock supply to be achieved by the Tronox-Cristal acquisition. (Stoll, Tr. 2111-12).

Response to Proposed Finding No. 120

The Proposed Finding is vague, conclusory, and not supported by the record. The combined company, immediately after the proposed acquisition, {
 }. (PX0010 at 219

(Tronox February 2017 Board Presentation) (*in camera*)).

Mr. Stoll provided no detail regarding the asserted “significant” savings, beyond his conclusory statement, and in any event, Cristal continues to pursue vertical integration through the Jazan slagger, efforts that are continuing today. (CCFF ¶¶ 921-30; Van Niekerk, Tr. 3955-56 (Tronox provided technical training to Cristal’s Jazan slagger personnel)). Further, as described in Response to Proposed Findings 118 and 119, (*see* CCRRFF ¶¶ 118-19, above), Tronox could in the future increase its own level of vertical integration by expanding its production of TiO₂ pigment, just as it described its objective to be at the time of the Exxaro acquisition.

B. The Transaction Will Result in Significant Expansion of TiO₂ Pigment and Feedstock Output, Benefiting Consumers.

121. The Tronox-Cristal transaction will generate substantial increase in the production of TiO₂ pigment and feedstock by the post-merger company. (Stern, Tr. 3852). Indeed, increasing output is a critical component of Tronox's plans after the merger to be competitive in the dynamic, global market place. (Quinn, Tr. 2363-64). As described by Tronox, "one of the primary drivers" of the Cristal acquisition "is to be able to get more out of the existing assets" and increase volume of TiO₂ production in the post-merger firm's plants. (Romano, Tr. 2216-17).

Response to Proposed Finding No. 121

The Proposed Finding is vague, incomplete, and contrary to the weight of the evidence. As Complaint Counsel has described in CCFE ¶¶ 842-60 (Yanbu), 898-908 (Jazan), 933-48 (other), Respondents have failed to verify the asserted increases in output, and the opinion of Mr. Stern does not establish otherwise. Mr. Stern cited to Tronox's asserted plans to increase production at Yanbu, but his opinion is contradicted by the real world issues that he did not address but that Tronox would face and that make it less likely that Tronox would accomplish at Yanbu what they have advocated. (CCFF ¶¶ 851-58). Further, his opinion is contradicted by the real world evidence from Mr. Hewson and Cristal's ordinary course documents that Cristal was making substantial progress in increasing TiO₂ output at Yanbu. (CCFF ¶¶ 861-86). Respondents also cite to Mr. Quinn, but his idea of "increasing output" appears mostly aligned with Tronox having more production capacity after the acquisition, (Quinn, Tr. 2363-64 ("increase output, you know, because of the additional pigment plants')), and in any event, Tronox, absent the acquisition, would continue to have an array of options for "increasing output." (CCFF ¶¶ 1009-10). Further, Respondents cite to Mr. Romano, but his primary role with respect to the acquisition has involved advocacy in the regulatory processes to secure approval of the proposed acquisition in different jurisdictions. (Romano, Tr. 2215-16) His testimony should therefore also be regarded as advocacy, and given little weight in support of the factual proposition.

122. From the very beginning, Tronox has planned to run its TiO₂ and feedstock facilities “all out,” or at full capacity, after the Cristal transaction. (RX0236.0001; Quinn, Tr. 2316-17; Turgeon, Tr. 2652, 2655).

Response to Proposed Finding No. 122

The Proposed Finding is incomplete, contrary to Tronox’s own internal planning and misleading. Specifically, its internal acquisition planning documents make clear that there would be times when Tronox would need less feedstock, and the only reason for that is it would be continuing its practice of reducing TiO₂ pigment production. (CCFF ¶¶ 595-612; PX1282 at 012 (Tronox Presentation) ([REDACTED] } (in camera)).

These planning documents which described how Tronox would at times use less feedstock (i.e., reduce pigment production) are consistent with the many recent internal documents that indicate Tronox’s overall intent going forward of adjusting production to demand, and not letting inventories get out of hand again. (CCFF ¶¶ 613-14).

123. In announcing the “preliminary framework” of the deal to the board of directors, then-CEO Tom Casey reported that “[t]his combination would increase our pigment production to approximately 1.25 million tons and our high grade feedstock SR and slag production to approximately 1.1 million tons (not including rutile).” (RX0236.0001; Quinn, Tr. 2316-17). Mr. Casey further reported to the board of directors: “Therefore, assuming we produce pigment at approximately capacity levels, we could run our slag and SR production facilities ‘all out,’ which would maximize the efficiency of both our pigment and feedstock production and enhance our margins significantly.” (RX0236.0001).

Response to Proposed Finding No. 123

The Proposed Finding is incomplete and misleading, because it omits any reference to Tronox’s expectation that there would be times when it would reduce production of TiO₂ pigment, as described in Response to Proposed Finding 122. (See CCRRFF ¶ 122, above). Further, this Proposed Finding makes no reference to Tronox’s opportunities and ability to expand pigment production, and through such expanded production also run its slag and SR production “all out.”

(CCFF ¶¶ 1001-02, 1009-10). It also does not refer at all to Tronox’s historical operating practice of reducing both feedstock and pigment production. (CCFF ¶¶ 527-36, 595-612, 996-98).

124. “Tronox on a stand-alone basis has about 465,000 tons . . . and Cristal has [approximately] . . . 700,000 or 650” of TiO₂ pigment production, and together “that would be 1.25 million.” (Quinn, Tr. 2317). The planned increase in TiO₂ pigment production “would be a significant increase [in TiO₂ pigment production].” (Quinn, Tr. 2317). Cristal has a high-grade feedstock capacity, so the total capacity on the feedstock side would be 1.1 million tons. (Quinn, Tr. 2316-17). Thus, achieving more overall production after the transaction would provide competitive benefits to the merged firm. (Turgeon Tr. 2642). Greater overall TiO₂ output will “distribute fixed costs over more pounds going out of the plant facility, and in so doing, [] reduce[] the fixed cost” of production and give the company “a better position on the cost curve globally.” (Stern, Tr. 3852).

Response to Proposed Finding No. 124

The Proposed Finding is vague and misleading. Tronox has not established that the proposed acquisition would lead to increased TiO₂ output, so the cite to Mr. Turgeon’s reference to “more overall production” is conclusory, and in any event, the cited testimony did not relate to the proposed acquisition. (Turgeon, Tr. 2642). Mr. Stern’s opinion regarding distribution of fixed costs is also theoretical and conclusory, and not based on any specific evidence established the necessary premise that at Cristal’s or Tronox’s North American chloride TiO₂ plants the proposed acquisition would lead to such increased output. Mr. Stern’s opinion also failed to account for Tronox’s and Cristal’s opportunities for internal expansion of TiO₂ pigment production, which would have the same effect he refers to. (CCFF ¶¶ 1009-10).

125. Currently, Cristal’s plants are running well below nameplate capacity. (Mancini, Tr. 2783, 2792-94). By contrast, Tronox has been “improving the utilization of” its plants since 2016. (Quinn, Tr. 2349-50, PX0010). Tronox operates its “plants at or near nameplate capacity, and it’s sometimes above nameplate capacity.” (Quinn, Tr. 2349-50; PX0010). Since Cristal has not been able to run its plants at or near nameplate capacity, “there is significant . . . output enhancement to be had by getting the Cristal plants up to the same level of utilization as the Tronox plants.” (Quinn, Tr. 2349-50; PX0010). By acquiring Cristal’s assets, which have been running “far from their nameplate capacity,” this will “create a huge opportunity for [Tronox] to increase [its] capacity and meet [its] customer requirement[s].” (Turgeon, Tr. 2659).

Response to Proposed Finding No. 125

The Proposed Finding is factually inaccurate, incomplete and misleading. The cite to Mr. Mancini does not support the conclusion that “Cristal’s plants are running well below nameplate capacity,” for his testimony as cited related only to the Cristal Yanbu and Jazan plants. The incomplete cite to Mr. Mancini also makes the references to Mr. Quinn’s testimony, which purport to draw a contrast between Tronox and Cristal, incomplete and misleading. The cite to Mr. Quinn is misleading also because it is generally true that chloride TiO₂ producers in North America increased capacity utilization during 2016 – so there was nothing unique about Tronox in this regard. Respondents’ non-specific cites to PX0010, a document of over 400 pages, are not probative.

Further, it is not correct that Tronox has a history of running its plant at or near capacity. Instead, Tronox has a history of reducing production at its pigment plants, including Hamilton. (CCFF ¶¶ 527-36, 595-612, 996-98). For years, in addition, Tronox has operated its Kwinana plant—a plant which has always been completely vertically integrated—well below its capacity. (PX5002 at 025 (¶ 50) (Hill Rebuttal Report to Stern and Imburgia) ([REDACTED] [REDACTED])) (*in camera*)). As Complaint Counsel has described, furthermore, there are a wide array of reasons that Tronox has fallen far short of verifying its claims of increased output at Cristal plants such as Yanbu. (CCFF ¶¶ 845-60). Finally, the Proposed Finding does not take into account progress Cristal has made to increase capacity utilization at for example, its Stallingborough plant, and has not demonstrated that Cristal could not be expected to achieve significant output increases on its own at the Yanbu plant. (CCFF ¶¶ 861-87).

126. Tronox will have an incentive to increase its output after the transaction, especially at Hamilton and Ashtabula, because those plants represent the lowest cost structure for both

Tronox and Cristal presently. (Stern, Tr. 3852; Turgeon, Tr. 2642 (describing how having the lowest cost structure earns producers “the right to grow”)).

Response to Proposed Finding No. 126

The Proposed Finding is vague and misleading. To the extent Hamilton is Tronox’s lowest cost plant, Tronox already has the incentive to increase output. There is nothing about the acquisition that increases the incentive to increase output. In fact, as Dr. Hill pointed, the acquisition increases Tronox’s incentive to reduce production, which it has done in the past for the purpose of supporting higher prices. (CCFF ¶¶ 658-84). In opining about Tronox’s incentive, Mr. Stern did not even consider Tronox’s past practice of reducing TiO₂ production, undermining both his credibility and any foundation he would otherwise have to testify about this issue. His opinion therefore is entitled to little weight. Further, to the extent that Hamilton is a low cost plant, and to the extent that Tronox’s vertical integration provides it with a low cost position, that combination of assets already provides Tronox with “the right to grow.” (CCFF ¶¶ 1003-10).

127. Tronox also has the unique ability to bring Cristal’s plants up to nameplate capacity. (Mancini, Tr. 2779). Tronox refers to this process as “unlocking the hidden factory.” (Turgeon, Tr. 2655-56). Tronox plans to “unlock the hidden factory” within Cristal plants in order to raise output and lower its cost-position in the TiO₂ industry. (Turgeon, Tr. 2655-56). The planned enhanced output of TiO₂ production post-transaction at Cristal’s Yanbu facility is a merger-specific synergy that will benefit customers by increasing TiO₂ pigment available in the market. (Mancini, Tr. 2782-85).

Response to Proposed Finding No. 127

The Proposed Finding is vague, unspecific and misleading. As with respect to other Proposed Findings, Mr. Mancini’s cited testimony addressed only the Yanbu plant in Saudi Arabia, making Respondents reference to “Cristal’s plants” overbroad in misleading. (Mancini, Tr. 2778-79).

Further, as detailed in Complaint Counsel’s Proposed Findings of Fact, Mr. Mancini’s testimony falls far short of verifying the asserted output increase even at that one plant, or

establishing that Tronox could achieve an output increase that Cristal could not achieve on its own. (CCFF ¶¶ 845-87). Instead, Mr. Mancini’s self-serving testimony regarding Tronox’s unique ability and Yanbu is conclusory and non-specific and does not provide factual information to verify the asserted efficiencies, and should be given little weight. The same is true of Mr. Turgeon’s testimony and indeed, Mr. Turgeon admitted on cross examination that the methodology employed by Tronox for “unlocking the hidden factory” was based in part on material provided by a consulting company. (Turgeon, Tr. 2864). Complaint Counsel has described in detail the array of reasons that Tronox has fallen far short of substantiating its claimed Yanbu efficiencies. (CCFF ¶¶ 885, 933-40).

128. Tronox has experience increasing output at newly acquired plants. (Dean, Tr. 2950). For example, when Tronox acquired Botlek, it produced 45-48,000 tons per year, and currently it produces 90,000 tons per year. (Dean, Tr. 2950).

Response to Proposed Finding No. 128

The Proposed Finding is incomplete and misleading. Tronox may have expanded the Botlek plant over a period of over ten years, but Cristal also has expanded TiO₂ plants. For example, the Yanbu plant original was a joint venture between Cristal and Tronox that became operational in 2002, but after Tronox left the joint venture in 2000, Cristal expanded the plant several times to increase its capacity by over { [REDACTED] }, from its original capacity of { [REDACTED] }—an overall expansion substantial greater than Tronox expanded Botlek. (PX2208 at 009-10 (Cristal Yanbu Presentation) (*in camera*)).

Further, Tronox also has experience in reducing output at acquired plants. When it acquired the Kemira chloride TiO₂ plant in Savannah, which like Yanbu was based on Kerr-McGee technology, Tronox described its unique ability to increase production at Savannah.

(PX9054 (Savannah Morning News Article); PX9070 (PR Newswire Article)). However, Tronox closed the Savannah chloride TiO₂ plant in 2009. (CCFF ¶¶ 590-92, 807).

129. The transaction will also create a larger “combined network” of TiO₂ production and distribution across the globe. (Mei, Tr. 3166-67). By acquiring Cristal’s global TiO₂ assets, the post-merger Tronox will have “more coverage” and a larger global “footprint” in terms of “where we can produce, optimize pigment, and what kind of grade can produce in what plants.” (Mei, Tr. 3167). Indeed, Tronox is currently developing a global “enterprise optimization model” to improve the efficiency of the global network and operations post-transaction, similar to network optimization tools used by Amazon and Apple. (Mei, Tr. 3164-66). Tronox’s customers will benefit from a larger global footprint because Tronox “will be closer to the customers in terms of where the products can be produced, on average basis.” (Mei, Tr. 3167). The improved global network will also give Tronox a “more reliable supply and stable quality” of TiO₂ feedstock, which will increase TiO₂ pigment output. (Mei, Tr. 3167).

Response to Proposed Finding No. 129

The Proposed Finding is based on self-serving and conclusory assertions, and should be afforded no weight. Tronox has not attempted to verify how it would optimize pigment and develop a “global optimization model,” or utilize its larger global footprint. Further, Ms. Mei provided no information to allow any assessment of how this asserted optimization would work as it relates to chloride TiO₂ customers in North America. Further, as Ms. Mei agreed, this model is something Tronox is “working on,” so by definition, Tronox cannot verify any asserted cost savings. (Mei, Tr. 3165; *see generally* CCFF ¶¶ 950-53, 956). In addition, the most recent estimate of savings that is associated with this enterprise optimization was { [REDACTED] } who Tronox identified as a witness but chose not to call at the trial. (PX7050 (Mei, Dep. at 178-80) (*in camera*)).

130. Increase in the global supply and availability of TiO₂ resulting from the Tronox-Cristal acquisition will benefit customers. (Shehadeh, Tr. 3443; Mei, Tr. 3167; [REDACTED])

[REDACTED] Mr. Greg Arrowood of Deceuninck North America testified that if “more titanium dioxide were available on the market” “that would be good for

Deceuninck.” (Arrowwood, Tr. 1130). [REDACTED]

Response to Proposed Finding No. 130

The Proposed Finding is speculative, and assumes the fact of increased output by Tronox, an assertion that Tronox has fallen fort short of establishing. Each one of Tronox’s references to customer testimony simply reflect leading questions that incorporate Tronox’s speculation about increased output. (Vanderpool, Tr. 248 ([REDACTED] [REDACTED]) (*in camera*); Arrowwood, Tr. 1130 (“Q. If more titanium dioxide were available on the market, that would benefit Deceuninck, correct? A. I believe that would be good for Deceuninck”)).

Respondents’ cites to Mr. Young of Sherwin Williams are incomplete and misleading. [REDACTED]
[REDACTED]
[REDACTED] } (Young, Tr. 733 (*in camera*)). Respondents did not include though the first part of his answer. With respect to the second cite, Mr. Young testified at trial, [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (Young, Tr. 734 (*in camera*)). With respect to both cites to Mr. Young, Respondents failures to provide the complete responses to their questions makes them the references to his testimony misleading.

Finally, the references to True Value not having any indication that Tronox intends to reduce capacity is overly narrow and misleading. It is overly narrow because it references only a reduction in capacity. It says nothing about reducing production, which as Complaint Counsel has described, Tronox has relied upon as a strategy to support higher prices. (CCFF ¶¶ 527-36, 595-612, 996-98).

C. Tronox Is Uniquely Qualified to Maximize TiO₂ Production at the Underperforming Pigment Facility in Yanbu, Saudi Arabia.

131. The Tronox-Cristal transaction presents a unique opportunity to enhance TiO₂ output by improving Cristal’s pigment plant in Yanbu, Saudi Arabia. (Dean, Tr. 2917, 3027-29).

Response to Proposed Finding No. 131

The Proposed Finding is inaccurate and contrary to the weight of the evidence. The record evidence clearly demonstrates that opportunities to enhance TiO₂ output at Yanbu are not unique to the Tronox-Cristal transaction. The record is clear that independent of the transaction; {

[REDACTED]

{ (CCFF ¶¶ 861-62, 865-87). {

[REDACTED]

[REDACTED] } (CCFF ¶¶ 862, 865). For example, {

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 862, 865-66). In addition,

{

[REDACTED] } (CCFF ¶¶ 867-75).

132. The Yanbu pigment plant has experienced low production rates for years. (Dean, Tr. 2979; Stern, Tr. 3851-52).

Response to Proposed Finding No. 132

The Proposed Finding is misleading and incomplete in that it suggests that in the last few years that the Yanbu pigment plant has only experienced low production rates, which is contrary to the record evidence. For example, { [REDACTED] } (CCFF ¶¶ 862, 865-67). Further, Respondents Proposed Finding should be disregarded by the Court because the assertion that “Yanbu pigment plant has experienced low production rates for years” is a factual proposition that should be established by fact witnesses or documents, not through the Stern’s expert testimony. (Tr. 3254).

133. Tronox has described increasing TiO₂ production at Yanbu to its nameplate capacity as a “key goal” of the proposed transaction. (Dean, Tr. 2917).¹⁸ Indeed, Tronox “ha[s] an extraordinarily high level of confidence in our ability to deliver and exceed the specific synergies with respect to . . . Yanbu.” (Mancini, Tr. 2795).

Response to Proposed Finding No. 133

The second sentence of the Proposed Finding is not supported by the evidence cited and further, the expressed “high level of confidence” is not reliable as a means to verify and substantiate the asserted Yanbu synergies. (PX9085 at 033 (Horizontal Merger Guidelines, §10) (“Therefore, it is incumbent upon the merging firms to substantiate efficiency claims so that the Agencies can verify by reasonable means the likelihood and magnitude of each asserted efficiency. . .”). Similarly, Dr. Zmijewski, Compliant Counsel’s efficiency expert, opines that { [REDACTED] } (CCFF ¶ 860; Zmijewski, Tr. 1463 (*in camera*)).

¹⁸ Post-closing, Mr. Dean will “be responsible for operating the Yanbu facility in Saudi Arabia.” (Dean, Tr. 2917).

[REDACTED]

(CCFF ¶ 843-44). [REDACTED]

[REDACTED] } (CCFF ¶ 843). Mr. Mancini is not an engineer and has never run a plant or worked in operations at Tronox. (Mancini, Tr. 2821). A few years ago, Mr. Mancini was in charge of the integration planning and synergy performance after Tronox acquired the alkali chemicals business from FMC Corporation. (Mancini, Tr. 2825-26). In that transaction, Tronox forecasted synergies of more than \$30 million in the first year, which would grow to more than \$60 annually by year three. (Mancini, Tr. 2829). Before Tronox sold the alkali chemical business, they were not on track to achieve the projected synergies. (Mancini, Tr. 2833). [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶

845-48). [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶ 849).

a. Yanbu Has Suffered from Low Operating Rates.

134. In recent years, the Yanbu TiO₂ facility’s performance has been “[e]xtremely subpar.” (Dean, Tr. 2979).

Response to Proposed Finding No. 134

The proposed finding is vague, incomplete and contradicted by the weight of the evidence.

The record evidence shows that [REDACTED]

[REDACTED] } (CCFF ¶ 862, 875-876). Moreover,

{ [REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 862, 865-67).

135. The nameplate capacity of Yanbu is 210,000 tons per year. (Dean, Tr. 2979-80).¹⁹ But under Cristal management, Yanbu has “not ever been able to produce” its nameplate capacity. (Quinn, Tr. 2350-51). [REDACTED]

[REDACTED] Last year, Cristal produced “approximately 130,000 tons, so some 80,000 tons short of capability of the facility.” (Dean, Tr. 2979-80). After Cristal added “three more lines, three more chlorinators [at Yanbu] . . . from 2001 to 2011 . . . they didn’t achieve any kind of ratio of production like they had with their other three lines.” (Dean, Tr. 2982-83).²⁰

Response to Proposed Finding No. 135

This Proposed Finding is incomplete and misleading. The first sentence of the Proposed Finding, which describes Yanbu nameplate capacity to be 210,000 pounds, and cites Mr. Dean, is factually inaccurate, incomplete, and contrary to the weight of the evidence. It does not take into account that at Yanbu specifically, Cristal has committed to supply TiCl₄, an intermediate product that is produced during the manufacture of raw TiO₂ pigment, to the Cristal/Tojo titanium metal joint venture that is at the Yanbu site. [REDACTED]

[REDACTED]

[REDACTED] } (PX7017

¹⁹ The Yanbu facility is capable of producing 210,000 tons per year because “if you look at the chlorinator size, you look at the condensation size, the six oxidizers . . . and the configuration of the finishing plant, the capacity of that facility really becomes bottlenecked at chlorination at around 212 to 215,000 tons.” (Dean, Tr. 2980). “The inherent capability of six oxidizers . . . is 238,000 tons.” The oxidation work that Dean has done “on the chlorination side, with only having two condensation trains . . . is at around 210,000, 215,000 tons of titanium dioxide equivalent.” (Dean, Tr. 2980).

²⁰ [REDACTED]

(Hewson, Dep. at 24-25) (*in camera*)). As ordinary course documents of both Tronox and Cristal described, this supply agreement necessarily means that Yanbu cannot produce the 210,000 tons of TiO₂ that Respondents refer to in this finding. [REDACTED]

[REDACTED] } (PX1405 at 006 (July 2017 email from Van Niekerk to Keegel and Mancini) (*in camera*); PX2291 at 003 (MGT Project, May 2017) ([REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (*in camera*); PX2328 at 012 (Cristal Presentation) ([REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (*in camera*)). Because Respondents have omitted

this key factual information regarding the impact of MGT, the finding is incomplete, vague and

misleading. In fact, in the Proposed Finding, Tronox does not even refer to PX1425, which is Mr.

Dean's *own analysis* of increased production at Yanbu. However, PX1425 [REDACTED]

[REDACTED]

[REDACTED] } (PX1425 at

001 (*in camera*); PX7023 (Dean, Dep. at 146-47) (*in camera*)). For the reasons Complaint Counsel

has described, of course, even the asserted 184,000 is highly speculative and has not been verified.

(CCFF ¶¶ 845-60; *see* CCRRFF ¶ 168, below).

The Proposed Finding in the next two sentences is misleading and incomplete. The record evidence is clear that [REDACTED]

[REDACTED] } (CCFF ¶ 862). Complaint Counsel has no

specific response to the Proposed Finding in the fourth sentence that Cristal produced approximately 130,000 tons last year. The Proposed Finding in the last sentence is factually inaccurate and contrary to the weight of the evidence. { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] }

(CCFF ¶¶ 862, 865-67).

136. [REDACTED]

[REDACTED]

Response to Proposed Finding No. 136

The Proposed Finding is misleading and incomplete in that it suggests that Cristal lacks technical expertise at the Yanbu plant and is unable to increase technical expertise through training and development of current operators, and recruitment of additional technical expertise.

Prior to the proposed acquisition and shortly after the proposed acquisition was announced,

{ [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 872-76). { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX7048

(Strayer, Dep. at 117-18) (*in camera*); see also PX7042 (Gunther, Dep. at 125-26 (*in camera*); CCFF ¶¶ 865-71 (describing improved results at Yanbu during 2016 and 2017)).

Further, { [REDACTED] } (CCFF

¶¶ 872-76). It was Mark Stoll, who Respondents cite in support of this Proposed Finding, { [REDACTED]

[REDACTED]
 [REDACTED]
 [REDACTED] } (PX2150 at 001 (Stoll email to Gunther and Hewson) (*in camera*)). Despite Mr. Stoll's decision prior to the Proposed Acquisition, [REDACTED]
 [REDACTED]

[REDACTED] } (PX7042 (Gunther, Dep. at 030) (*in camera*); PX7048 (Strayer, Dep. at 218) (*in camera*)).

137. [REDACTED]
 [REDACTED]
 [REDACTED]

Response to Proposed Finding No. 137

The Proposed Finding is vague, factually inaccurate and contrary to the weight of the evidence as to the statement in the second sentence that Cristal lacks the institutional know-how in the Kerr-McGee low-pressure technology. As referenced in the Response to Proposed Finding No. 136, [REDACTED]
 [REDACTED]

[REDACTED] } (CCFF ¶¶ 872-76). Cristal has significant technical expertise in low-pressure technology also with Graham Hewson, Vice President of Operations Integrations, who worked at Tronox for over 21 years, including 7 years as the general manager of Tronox's Kwinana plant. (Hewson, Tr. 1602-03). Moreover, Cristal has some

²¹ The difference between high-pressure and low-pressure technology is, "the mode of force that drives the process [with low pressure technology] is gravity. We have tanks at the beginning of the oxidation process where we have the titanium tetrachloride is actually elevated up in the air, and as it's fed into the vaporization process, that height determines the maximum pressure that's going to be generated in the process. Other manufacturers actually pump the titanium tetrachloride in, and that can take it up to a much higher pressure." (Dean, Tr. 2929-30).

institutional knowledge of the Kerr-McGee low-pressure technology {
[REDACTED]
[REDACTED]
[REDACTED]}

(Hewson, Tr. 1608-11 (*in camera*)).

138. Although Cristal previously had a contract with Kerr-McGee to help run the Yanbu facility, today Cristal does not “have the inherent low-pressure technology fundamentals in the organization today. They lost that after they lost the support” from Kerr-McGee. (Dean, Tr. 2984-85).²²

Response to Proposed Finding No. 138

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence for the reasons stated in Response to Proposed Finding No. 137. (*See* CRRFF ¶ 137, above).

139. After Cristal and Kerr-McGee “went separate ways,” “Cristal started expanding the plant, but they did it without any sort of ongoing technical support, and they had had no operational support as well, product development support.” (Dean, Tr. 2980-81). Yanbu “has gone through multiple expansions since around the 2000, 2001 time frame, and that was coincident with the time when Cristal separate from Kerr-McGee, who was a 25 or 30 percent owner in Yanbu at that time.” (Dean, Tr. 2980-81).

Response to Proposed Finding No. 139

The Proposed Finding in the first sentence is misleading and incomplete in that it suggests that Cristal was unfamiliar with low-pressure technology and lacked any operational knowledge.

{
[REDACTED]
[REDACTED]
[REDACTED]} (Hewson, Tr. 1608-11 (*in camera*)). {
[REDACTED]
[REDACTED]
[REDACTED]} (PX7008 (Hewson, IHT at 114) (*in*

²² Although “Cristal acquired new facilities . . . through the acquisition of Millennium,” “Millennium had no know-how or technology that’s related to the Tronox technology.” (Dean, Tr. 2984-85).

camera)). { [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } which Mr. Quinn also reiterated in testimony. (PX0010 at 199 (Tronox Board of Directors presentation) (*in camera*); Quinn, Tr. 2322, 2355-56).

140. [REDACTED]
[REDACTED]

Response to Proposed Finding No. 140

This Proposed Finding is incomplete and misleading. As described above in Response to Proposed Findings 135 and 136, (*see* CCRRFF ¶¶ 135-36, above), Cristal not only has tried to address production issues at Yanbu, [REDACTED]
[REDACTED]

[REDACTED] (*See* CCRRFF ¶ 137, above).

141. [REDACTED]

[REDACTED] Cristal has “brought in people that have retired or left Tronox or Tronox-related operations to . . . try and bring in that expertise, but there’s never been any sustainable” efforts implemented at Yanbu. (Dean, Tr. 2984-85). The former Tronox employees “left the business for a reason, either for retirement or other reasons personal to them, and their state of knowledge ended at that point in time, whereas the improvements in the technology are a continuous evolution. (Dean, Tr. 2984-85).

Response to Proposed Finding No. 141

The Proposed Finding is misleading and contrary to the weight of the evidence. { [REDACTED]
[REDACTED] } (CCFF ¶¶ 872-74); Hewson, Tr. 1629-31 (*in camera*). { [REDACTED]
[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 872-74). { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX7048 (Strayer, Dep. at 117-18) (*in camera*);
see also PX7042 (Gunther, Dep. at 125-26) (*in camera*)); CCFF ¶¶ 865-71 ({ [REDACTED]
 [REDACTED] })). { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶

876). [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] }

(CCFF ¶¶ 862, 864-67, 871-77).

142. Cristal has also had “numerous” SWAT team initiatives, where “they tried to get technical and operational personnel that could come in and help the local team operate the plant better and get production rates up.” (Dean, Tr. 2980-81). Yanbu will not be fixed with a “SWAT” team. (Dean, Tr. 3073). “Every example of [Cristal] bringing in these groups to [fix Yanbu] . . . whether it be some old Tronox employees or . . . Cristal people from around the world . . . [did] not build a sustainable work process.” (Dean, Tr. 3131-32).

Response to Proposed Finding No. 142

The Proposed Finding is misleading and contrary to the weight of the evidence, because it suggests that Cristal has not made progress in improving Yanbu. For example, { [REDACTED]

[REDACTED]

[REDACTED] } (Hewson, Tr. 1617-18 *in camera*). Further, { [REDACTED]

[REDACTED]

[REDACTED] } (Hewson, Tr. 1619 *in camera*).

{ [REDACTED]

[REDACTED] } (Hewson, Tr. 1620 *in camera*)). { [REDACTED]

[REDACTED] } (Hewson, Tr. 1621 *in camera*)). { [REDACTED]

[REDACTED] }

(Hewson, Tr. 1633 *in camera*)). { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 872-74; Hewson, Tr. 1629-31 *in camera*)).

143. Cristal has also made a “series of errors” at Yanbu. Cristal did not develop “the people correctly” and did not have a good handle on the technology, which “caused them many operational problems.” (Dean, Tr. 2980-81).

Response to Proposed Finding No. 143

The Proposed Finding is vague, incomplete, misleading and contrary to the weight of the evidence. The overwhelming evidence—from Cristal witnesses who have direct knowledge of the Yanbu operations—is that both prior to the curtailment, and then after the ramp up in production in 2016 and into 2017, { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 862, 864-79). For example, { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶ 862).

144. Mr. Graham Hewson is the current vice president of integration operations at Cristal, and was previously the vice president of manufacturing at Cristal, beginning in 2013. (Hewson, Tr. 1600; 1604). Mr. Hewson was also the director of Cristal's operational excellence program for one year in 2012. (Hewson, Tr. 1604).

Response to Proposed Finding No. 144

Complaint Counsel has no specific response.

145. [REDACTED]

Response to Proposed Finding No. 145

The first sentence of the Proposed Finding is vague, misleading and incomplete in that it states that [REDACTED]

[REDACTED] This vague and conclusory statement that Respondents cite runs counter to the detailed testimony from Mr. Hewson regarding the improvements Cristal has made at Yanbu, [REDACTED]

[REDACTED]. (CCFF ¶¶ 862-84). [REDACTED]

[REDACTED] } (CCFF ¶¶ 872-76). [REDACTED]

[REDACTED] } (Hewson, Tr. 1632 (*in camera*)).

The second sentence of the Proposed Finding, that [REDACTED], is misleading and contradicted by other testimony from the same witness. [REDACTED]

[REDACTED] } (PX7008 (Hewson, IHT at 165, 173-75) (*in camera*)) ([REDACTED])

[REDACTED]; Hewson, Tr. 1636 (*in camera*); *see also* CCFE ¶¶ 882). Further, whether Cristal produces 180,000 tons, there can be no doubt that, as Mr. Hewson testified, Cristal continued through 2017 [REDACTED] [REDACTED] } (CCFE ¶¶ 862, 865-79).

b. Tronox Has Proprietary Know-How and Expertise in Yanbu’s Low-Pressure Chloride Technology.

146. Kerr-McGee, the predecessor company to Tronox, helped Cristal build Yanbu. (Dean, Tr. 2930, 2979; Hewson, Tr. 1608). Yanbu was built using Kerr-McGee’s proprietary low-pressure chloride TiO₂ production technology. (Dean, Tr. 2930, 2979; Hewson, Tr. 1609).

Response to Proposed Finding No. 146

Complaint Counsel has no specific response.

147. [REDACTED]

Response to Proposed Finding No. 147

Complaint Counsel has no specific response.

148. [REDACTED]

Response to Proposed Finding No. 148

Complaint Counsel has no specific response.

149. The Kerr-McGee technology used for the chloride process at Yanbu is “owned by Tronox.” (Stoll, Tr. 2110). In fact, Cristal’s Yanbu plant “is built on the same technology as . . . Tronox’s Hamilton, Mississippi plant. It was built with the old Kerr-McGee technology” that Tronox is the successor to. (Quinn, Tr. 2350 - 51).

Response to Proposed Finding No. 149

Complaint Counsel has no specific response.

150. Tronox, the legacy company of Kerr-McGee, is “the master in the titanium dioxide industry at low-pressure technology.” (Dean, Tr. 2929-30). Tronox has “inherent intellectual property that exists in that low-pressure technology.” (Dean, Tr. 2930-31). “[I]f you look back at the history of the industry, Tronox or its predecessor, Kerr McGee, continued a long period of research and development and development of the low-pressure technology.” (Dean, Tr. 2930-31). “Tronox was the only company that ever . . . mastered that particular technology.” (Dean, Tr. 2930-31). “[W]e’ve refined [low-pressure] technology. We’ve become very good at it. We’re recognized as one of the top producers of good quality pigment.” (Dean, Tr. 2930-31). The low-pressure chloride technology in place at Yanbu is Tronox’s “bread and butter. It’s what we do in Mississippi and in Australia.” (Quinn, Tr. 2355).

Response to Proposed Finding No. 150

The Proposed Finding is misleading and contrary to the weight of the evidence, to the extent that it suggests that Cristal either lacks or cannot acquire or develop internally the expertise required to operate the Yanbu plant. The record establishes that { [REDACTED] [REDACTED] [REDACTED] } (see CCRRFF ¶ 136, above), and further, that { [REDACTED] [REDACTED] [REDACTED] } (CCFF ¶¶ 872-76). As referenced in Response to Proposed Finding No. 136, { [REDACTED] [REDACTED] [REDACTED] } (CCFF ¶¶ 872-76). In addition, as mentioned in Response to Proposed Finding No. 137, Graham Hewson, Vice President of Operations Integrations, who worked at Tronox for over 21 years, including 7 years as the general manager of Tronox’s Kwinana plant, has significant experience in low-pressure technology. (Hewson, Tr. 1602-03).

151. [REDACTED]

Response to Proposed Finding No. 151

The Proposed Finding is vague, misleading and incomplete. To the extent that the Proposed Finding suggests that Tronox is the main TiO₂ producer that uses low-pressure chloride technology to produce TiO₂, it is vague and misleading, since the word “main” in this context is subject to a range of interpretations. { [REDACTED]

[REDACTED] } (Hewson, Tr. 1608
(*in camera*)).

152. [REDACTED]
[REDACTED] Tronox has had 20 years of experience with Kerr-McGee/Tronox technology to which Cristal has not had access. (Turgeon, Tr. 2657-59).

Response to Proposed Finding No. 152

The Proposed Finding is misleading and incomplete in that it suggests that Cristal lacks low-pressure technology experience relevant to Yanbu. As discussed in the Response to Proposed Finding No. 141, (*see* CCRRFF ¶ 141, above), the record evidence is clear that { [REDACTED]
[REDACTED] } (CCFF ¶¶ 872-74; Hewson, Tr. 1629-32 (*in camera*)). As described earlier (*see* CCRRFF ¶ 137, above), { [REDACTED]

[REDACTED] } (Hewson, Tr. 1608-11 (*in camera*)).

153. As a result, Tronox has a “unique skill-set to be able to bring to [Yanbu] that no other company in the world possesses.” (Quinn, Tr. 2355-56). Tronox is “uniquely qualified to assist the Yanbu plant.” (Mancini, Tr. 2790-91). It is “pretty obvious that Tronox would have a significant impact on improving the operating rate and efficiency and consequently the cost posture of that plant.” (Stern, Tr. 3851).

Response to Proposed Finding No. 153

The Proposed Finding is misleading and incomplete in that it suggests that Cristal lacks the technical expertise to improve the quality, reliability and production at Yanbu. The record is replete with evidence that { [REDACTED] }
{ [REDACTED] }
(CCFF ¶¶ 862, 864-82).

Further, the testimony of the Tronox witnesses in support of this finding is entitled to very little weight. Mr. Quinn has very little practical experience on which to testify that Tronox's skill-set relative to Yanbu is unique—he has never been involved in manufacturing operations and also has not been involved with assessing, and did not testify about, Cristal's internal developments relating to Yanbu. (Quinn, Tr. 2366-69). Similarly, Mr. Manicini does not have operating experience, and largely relied on others, such as Mr. Dean, for information he developed in connection with Yanbu. (See CCRRFF ¶ 133, above). Finally, Mr. Stern's testimony is particularly unreliable. What he actually testified was that because the plant had been running at low operating rates in his view, that "it seems pretty obvious that Tronox would have a significant impact on improving the operating rate." (Stern, Tr. 3851). During his testimony, he referred to his expert report, in which it turns out that the "foundation" for his opinion is the fact that "Tronox is confident it can resolve the Tronox production issues." (RX0171 at 0130 (¶280) (Stern expert report) (*in camera*)). However, reliance on Tronox's confidence is neither analysis nor verification of the asserted Yanbu claims. (CCFF ¶¶ 845-60).

154. The Yanbu plant is nearly identical in every material way to Tronox's TiO₂ plants, including Tronox's Botlek, Kwinana, and Hamilton facilities. (Dean, Tr. 2979). [REDACTED]
[REDACTED]

Response to Proposed Finding No. 154

The Proposed Finding is misleading and incomplete in that it suggests that there are no significant differences between Tronox's Botlek, Kwinana, and Hamilton facilities and Cristal's Yanbu plant. The record evidence demonstrates that { [REDACTED] } (CCFF ¶¶ 851-55). { [REDACTED] } (CCFF ¶ 852). { [REDACTED] } (Hewson, Tr. 1612 (*in camera*)). { [REDACTED] } (Hewson, Tr. 1612-13 (*in camera*)).

155. For instance, Yanbu's oxidizers are "virtually a copy of what [Tronox] has in [its] plants." (Dean, Tr. 2977). Yanbu's "oxidizer physical design from the outside looks to be nearly identical to the oxidizers [Tronox] run[s] in Botlek, Kwinana, and Hamilton." (Dean, Tr. 2977). This is because Yanbu was built "around 1990 or 1991," approximately the same time Tronox's TiO₂ plants at Botlek and Kwinana were built with similar technology. (Dean, Tr. 2979).

Response to Proposed Finding No. 155

Complaint Counsel has no specific response.

156. Of the plants that use "Kerr-McGee/Tronox low-pressure technology" Hamilton performs the best. (Dean, Tr. 2979). Hamilton performs well because it has a "very stable, very well-trained and disciplined workforce, and they understand the technology very, very well." (Dean, Tr. 2979).

Response to Proposed Finding No. 156

The Proposed Finding is misleading and incomplete to the extent that it suggests that compared to Hamilton, Cristal lacks operational expertise to operate Yanbu. In a due diligence report presented to the Tronox Board of Directors about Tronox's proposed acquisition of Cristal, { [REDACTED] } which Mr. Quinn also

reiterated in testimony. (PX0010 at 199 (Tronox Board of Directors presentation) (*in camera*); Quinn, Tr. 2322, 2355-56). As was stated in Response to Proposed Finding No. 137 (*see* CRRFF ¶ 137, above), and, is incorporated by reference herein, { [REDACTED] } (CCFF ¶¶ 872-76; Hewson, Tr. 1602-03).

Further, the reference in this Proposed Finding to the “stable” and “well-trained” workforce at Hamilton highlights one of the issues that Cristal had had at Yanbu, and that is the loss of trained personnel during the production curtailment from 2015 to 2016, and further, working within the constraints of the diverse workforce and government regulations to maintain a skilled and disciplined workforce. This is an area in which Cristal, with its experience in Saudi Arabia, has been working to address, and has much more experience in addressing than Tronox. (CCFF ¶¶ 864, 851-55).

157. As Cristal acknowledges, there are two ways that Tronox’ expertise can assist in the operation at Yanbu:

- a. [REDACTED]
- b. [REDACTED] Cristal cannot provide the same experience to its workers that Tronox can provide because “they don’t operate a plant that resembles [Yanbu’s] technology, and the plants they operate, operate significantly differently.” (Dean, Tr. 2990).

Response to Proposed Finding No. 157

The Proposed Finding is misleading and incomplete because it suggests that Cristal lacks technical expertise and experience to operate Yanbu. As described in Response to Proposed Finding No. 137, and is incorporated by reference herein, { [REDACTED] } (CCFF ¶¶ 872-76; Hewson, Tr. 1602-03).

{ [REDACTED]

[REDACTED]

[REDACTED] (Hewson, Tr. 1626-27, 1630-31 (*in camera*); see also CCFE ¶ 862). [REDACTED]

[REDACTED]

[REDACTED] } (CCFE ¶¶ 862-82). [REDACTED]

[REDACTED]

[REDACTED] } (Hewson, Tr. 1632 (*in camera*)).

158. The “Yanbu plant was visited by a team” during pre-signing due diligence. (Dean, Tr. 2970). Mr. Dean has been to the “Yanbu plant several times” and has evaluated the plant to “ascertain its capabilities” as part of his “due diligence responsibilities.” (Dean, Tr. 2975-76).

Response to Proposed Finding No. 158

Complaint Counsel has no specific response.

159. Mr. Dean, a vice president in Tronox’s manufacturing operations who has previously served as plant manager at Hamilton and has been the plant manager at seven other plants, will have primary responsibility for coordinating all the Tronox resources invested in the Yanbu Transformation Plan. (Mancini, Tr. 2796-97; Dean, Tr. 2995-96). Only “ten” other people at most in the world have experience similar to Mr. Dean’s in regards to “turning around TiO₂ pigment plants.” (Dean, Tr. 2996).

Response to Proposed Finding No. 159

Complaint Counsel has no specific response to the first sentence of this Proposed Finding. However, the Proposed Finding in the second sentence, which states, “[o]nly ‘ten’ other people at most in the world have experience similar to Mr. Dean’s in regards to ‘turning around TiO₂ pigment plants[,]” is vague and misleading and irrelevant in that it suggests that Cristal lacks people who can improve the operations at Yanbu. In any event, Mr. Dean did not describe what he meant by “turning around” a TiO₂ pigment plant, but as he described, [REDACTED]

[REDACTED] } (CCFE ¶851). Further, Mr. Dean’s experience

at Savannah, which Respondents have not referenced at all, is experience that should not qualify as a successful turnaround, in that the two TiO₂ plants at Savannah—including a low-pressure chloride TiO₂ plant—were closed by Tronox. (CCFF ¶¶ 588-90).

As was stated above in Response to Proposed Finding No. 137 (*see* CCRRFF ¶ 137, above), and is incorporated by reference herein, { [REDACTED] } (CCFF ¶¶ 872-76; Hewson, Tr. 1602-03). Further, { [REDACTED] } (CCFF ¶¶ 862-78).

160. The Yanbu Transformation Plan reflects “the series of things that [Mr. Dean] believe[s] are critical” for Tronox to do “to start the process of Yanbu turning around to become a productive facility and . . . getting back to the capabilities [Yanbu] exhibited in the late nineties.” (Dean, Tr. 2994-95). This primarily includes applying the “Tronox Way” to Yanbu. (Dean, Tr. 2995, 3003, 3055). [REDACTED]

Response to Proposed Finding No. 160

The Proposed Finding is vague, misleading, incomplete and contrary to the weight of the evidence. The Tronox Way, which Tronox plans to implement at Yanbu to improve its performance, does not require Tronox to merge with Cristal. (CCFF ¶¶ 883, 885-86). Tronox has acknowledged that Cristal does not need a merger with Tronox to implement a variety of operational functions that would improve Yanbu. (CCFF ¶ 883). Furthermore, similar to Tronox, Cristal can hire third-party consultants to help improve organizational culture at Yanbu. (CCFF ¶ 885).

161. Mr. Dean’s primary goal for the Yanbu Transformation is “to get the plant to its nameplate capacity of 210,000 tons of titanium dioxide equivalent and to deliver the synergies that have been identified in the early phases of due diligence in the project.” (Dean, Tr. 2917). As a part of implementing the Tronox Way at Yanbu, Dean will work “with the leadership team to look

at how [Tronox is] going to redesign the organization so that it will fit [Tronox's] Tronox Way templates." (Dean, Tr. 2995).

Response to Proposed Finding No. 161

The Proposed Finding in the first sentence is factually inaccurate and contrary to the weight of the evidence in as much as it declares that the nameplate capacity of Yanbu is 210,000 tons.

{ [REDACTED] } (PX1425 at 001 (Tronox Yanbu Improvement Plan) (prepared based on estimates of Mr. Dean, CCFE ¶ 843); Hewson, Tr. 1608 (*in camera*); Stoll, Tr. 2110 (*in camera*); PX7048 (Strayer, Dep. at 40) (*in camera*)). Further, the issue of whether Mr. Dean works with the leadership team to attempt to implement the "Tronox Way" again is far from any reasonable assurance of what impact implementing the Tronox Way would have at Yanbu. { [REDACTED]

[REDACTED]

{ [REDACTED] } (CCFE ¶ 853). { [REDACTED]

[REDACTED] }"

(PX7023 (Dean, Dep. at 43-45) (*in camera*)). In addition, the record establishes that { [REDACTED]

[REDACTED]

[REDACTED]

{ [REDACTED] } (CCFE ¶¶ 863-66, 875, 873-

78).

162. [REDACTED]

[REDACTED]

Response to Proposed Finding No. 162

The Proposed Finding is misleading and incomplete in that Tronox’s assertion that it will improve the operating line rate at Yanbu is based on Mr. Dean’s experience and expected improvements, rather than any analysis that can reasonably be verified. (CCFF ¶ 847). Further, it is speculative and conclusory, and fails to address any of the array of issues unique to Yanbu. (CCFF ¶¶ 851-53). As such, it should be given little weight. (PX9085 at 033 (Horizontal Merger Guidelines, § 10) (“Efficiency claims will not be considered if they are vague, speculative, or otherwise cannot be verified by reasonable means.”)). Further, { [REDACTED] } (CCFF ¶¶ 867-69).

163. [REDACTED]

Response to Proposed Finding No. 163

The Proposed Finding is incomplete, misleading, and contrary to the weight of the evidence. { [REDACTED] }
[REDACTED]
{ [REDACTED] } (CCFF ¶¶ 862, 867-69, 872-78). { [REDACTED] }
[REDACTED]
{ [REDACTED] } (Hewson, Tr. 1611-14 (*in camera*)). { [REDACTED] }
[REDACTED]
{ [REDACTED] } (Hewson, Tr. 1626-27, 1630-31 (*in camera*); *see also* CCFF ¶¶ 862, 875). { [REDACTED] }
[REDACTED]. }
(CCFF ¶¶ 868, 879-80). { [REDACTED] }

[REDACTED]

[REDACTED] } (PX7017 (Hewson, Dep. at 160-61) (*in camera*)). [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶ 857).

164. Under Mr. Dean’s approach, “developing [the] workforce is going to be . . . first and foremost [a part of Mr. Dean’s] approach to turning [Yanbu] around. (Dean, Tr. 2985-86). Tronox will not “try to force knowledge” but will “develop [the] knowledge” instead. (Dean, Tr. 2985-86). “[T]he Saudi workforce . . . is very easy to learn. . . [T]he huge benefit that [Tronox] bring[s]” is the fact that Tronox has “three plants that are operating” the same technology at Yanbu “extremely successfully.” (Dean, Tr. 2986-88).

Response to Proposed Finding No. 164

The Proposed Finding is vague, incomplete, misleading, and contrary to the weight of the evidence. Mr. Dean has acknowledged [REDACTED]

[REDACTED] } (CCFF ¶ 854). [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶ 854). [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 852, 854-55). Tronox does not operate any TiO2 plants in Saudi Arabia. (CCFF ¶ 855).

165. [REDACTED]

[REDACTED]

Response to Proposed Finding No. 165

The Proposed Finding is speculative, incomplete and misleading. Mr. Dean’s forecast of line rates at Yanbu are speculative and merely reflect his judgment and lack foundation. (CCFF

¶¶ 845-50). A few years ago, Tronox acquired the alkali chemicals business from FMC Corporation. (Mancini, Tr. 2825-26). In that transaction, Tronox forecasted synergies of more than \$30 million in the first year, which would grow to more than \$60 annually by year three. (Mancini, Tr. 2829). Before Tronox sold the alkali chemical business, however, they were not on track to achieve the projected synergies. (Mancini, Tr. 2833). { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 845-48). { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶ 849). Finally, { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 867-69).

166.

[REDACTED]

Response to Proposed Finding No. 166

This Proposed Finding is incomplete and misleading. { [REDACTED]

[REDACTED]

[REDACTED] } (Dean, Tr. 3049-51 (*in*

camera); PX1425 at 001 (*in camera*)). For example, unlike Hamilton, Yanbu has more days during the year affected by religious holidays, and [REDACTED] [REDACTED] Further, [REDACTED] [REDACTED] [REDACTED].} (CCFF ¶¶ 863-64).

Further, the overwhelming evidence is that [REDACTED] [REDACTED] [REDACTED] } (CCFF ¶¶ 862-80). The Response to Proposed Finding No. 165 is incorporated by reference herein. (*See* CCRRFF ¶ 165, above).

167. [REDACTED] Yanbu's chlorinators are similar to those at Hamilton, Kwinana, and Botlek. "They have four 12-foot and two 14-foot chlorinators in that arrangement." (Dean, Tr. 2976-77).

Response to Proposed Finding No. 167

This Proposed Finding is speculative, lacks foundation, and is incomplete. [REDACTED] [REDACTED] [REDACTED] [REDACTED] } (Dean, Tr. 3052 (*in camera*)). Further, [REDACTED] [REDACTED] [REDACTED] } (Dean, Tr. 3052 (*in camera*)). Thus, the information that Mr. Dean did not provide prevents analysis and verification of his assertions. In any event, the record shows that [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 862-80).

168.

[REDACTED]

Response to Proposed Finding No. 168

The Proposed Finding is incomplete, misleading, and contrary to the weight of the evidence. { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 862, 865-71, 882; PX7008 (Hewson, IHT at 165, 173-75) (*in camera*); Hewson, Tr. 1636 (*in camera*)). { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 845-60).

169.

[REDACTED]

[REDACTED] Tronox’s expected production rates are also based on the fact that Tronox’s other plants use virtually the same equipment to create the same product. (Dean, Tr. 2979).

Response to Proposed Finding No. 169

The Proposed Finding is vague, incomplete and misleading. { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (CCFF

¶ 843). { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 845-48). Further, { [REDACTED]

[REDACTED] } (CCFF ¶¶ 851-54). Respondents’ reliance on their experience at Hamilton, with a different environment than Yanbu, is also undermined by their contrasting experience at Savannah, where despite bold predictions of a plant turnaround, Tronox ultimately closed the chloride TiO2 plant at the site. (CCFF ¶¶ 588-90). [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶ 849).

c. The FTC Does Not Have Expertise to Challenge the Substantial Yanbu Synergies.

170. [REDACTED]

Response to Proposed Finding No. 170

The Proposed Finding is misleading and not relevant to the antitrust analysis of the claimed efficiencies related to Yanbu. Dr. Zmijewski is an expert in the field of finance, accounting, and economics. (Zmijewski, Tr. 1430). He testified that { [REDACTED]

[REDACTED] } (Zmijewski, Tr. 1466 (*in camera*)).

Further, he stated that { [REDACTED]

[REDACTED] } (Zmijewski, Tr. 1466 (*in camera*)). { [REDACTED]

[REDACTED]

[REDACTED] } (Zmijewski, Tr. 1441 (*in camera*); PX5001 at 006 (¶ 4) (Zmijewski Initial Report) (*in camera*)). Dr. Zmijewski opined that { [REDACTED]

[REDACTED] } (Zmijewski, Tr. 1461-63 (*in camera*)). He

further stated that { [REDACTED]
[REDACTED] } (CCFF ¶ 831).

171. [REDACTED]
[REDACTED]

Response to Proposed Finding No. 171

Complaint Counsel has no specific response.

172. [REDACTED]
[REDACTED]

Response to Proposed Finding No. 172

The Proposed Finding is misleading and not relevant. The Response to Proposed Finding No. 170 is incorporated by reference herein. (*See* CCRRFF ¶ 170, above).

D. The Post-Merger Tronox Will Realize Efficiencies from Shared Best Practices from Both Cristal and Tronox Pigment Plants.

173. The transaction will also generate efficiencies in TiO₂ pigment production from the sharing of best practices across the merged firm. (Turgeon, Tr. 2657-58). The post-merger Tronox “will take the best out of Cristal and the best out of Tronox, and combining it together, our practice will become even more solid.” (Turgeon, Tr. 2657-58).

Response to Proposed Finding No. 173

The Proposed Finding is vague as to the meaning of the terms “best practices” and “more solid.” It is also incomplete in that it fails to quantify any synergy arising from the sharing of such practices or specify the anticipated timeframe for achieving any such synergy. It also fails to address the key question under the Horizontal Merger Guidelines of whether the claimed synergy is cognizable (i.e., verifiable, merger-specific, and not arising from competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines)). In fact, the evidence shows that the claim lacks sufficient foundation and relies on unfounded assumptions and unverifiable business judgment. (CCFF ¶¶ 934-38). Moreover, the Proposed Finding fails to demonstrate that the synergy is merger-specific and excludes improvements each company could practically implement on a stand-alone basis.

(CCFF ¶¶ 939-40). Finally, it fails to specify how or the extent to which any purported best practices synergy would benefit North American customers of chloride TiO₂.

174. First, Tronox will apply the “Tronox Way” to facilities Tronox acquires at Cristal. (Turgeon, Tr. 2657-58). Second, Tronox will apply best practices from Cristal “using their knowledge, theirs being Cristal, to try to use some of their best practices to get additional volume from our own plants.” (Romano, Tr. 2216-17).

Response to Proposed Finding No. 174

The Proposed Finding is vague and incomplete in that it fails to define the “Tronox Way,” fails to explain how any practices from the Tronox Way will improve Cristal plants, fails to quantify any purported improvement from applying the Tronox Way, and fails to specify how or the extent to which any such improvement would benefit North American customers of chloride TiO₂. It is also incomplete in that it fails to address whether applying the Tronox Way is a cognizable efficiency under the Horizontal Merger Guidelines (i.e., verifiable, merger-specific, and not arising from competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines)). In fact, the Tronox Way contains a number of aspects that Respondents have not shown are merger-specific. (CCFF ¶ 883). Mr. Turgeon himself acknowledged that Cristal could hire a third party to help it achieve its own version of operational excellence. (Turgeon, Tr. 2685). The Proposed Finding is also vague and incomplete in that it fails to specify which of Cristal’s practices Tronox claims it would apply to its own plants, fails to quantify any purported improvement from applying any such practices, and fails to specify how or the extent to which any such improvement would benefit North American customers of chloride TiO₂.

175. The best practices from both Tronox and Cristal will be employed “globally” across all of the post-merger TiO₂ plants post-merger. (Turgeon, Tr. 2657-58). As a result, “the combination of the know-how of Cristal and the know-how of Tronox will allow [Tronox] to refine those standards that we have developed in Tronox” on a global basis across a larger footprint of TiO₂ pigment plants after the transaction. (Turgeon, Tr. 2657-59).

Response to Proposed Finding No. 175

The Proposed Finding is vague as to the terms “best practices,” “know-how,” “standards,” and “refine.” It is also incomplete in that it fails to quantify any synergy arising from the sharing of such practices or specify the anticipated timeframe for achieving any such synergy. It also fails to address the key question under the Horizontal Merger Guidelines of whether the claimed synergy is cognizable (i.e., verifiable, merger-specific, and not arising from competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines)). In fact, the evidence shows that the claim lacks sufficient foundation and relies on unfounded assumptions and unverifiable business judgment. (CCFF ¶¶ 934-38). Moreover, the Proposed Finding fails to demonstrate that the synergy is merger-specific and excludes improvements each company could practically implement on a stand-alone basis. (CCFF ¶¶ 939-40). Finally, it is incomplete because it fails to specify how or the extent to which any practices applied “on a global basis” would specifically benefit North American customers of chloride TiO₂.

176. Indeed, Tronox has described combining Tronox and Cristal’s best practices as “the best way” to “continue to improve our practice and improve our technology.” (Turgeon, Tr. 2666-67).

Response to Proposed Finding No. 176

The Proposed Finding is vague as to the term “best practices,” and incomplete in that it fails to specify which practices it claims it will combine, which technology they will purportedly improve or how. It is also incomplete in that it fails to quantify any synergy arising from the “combining” of such practices or specify the anticipated timeframe for achieving any such synergy. It also fails to address the key question under the Horizontal Merger Guidelines of whether the claimed synergy is cognizable (i.e., verifiable, merger-specific, and not arising from competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines)). In fact, the evidence shows that the claim lacks sufficient foundation and relies on unfounded assumptions and unverifiable business judgment. (CCFF ¶¶ 934-38). Moreover, the Proposed Finding fails to demonstrate that

the synergy is merger-specific and excludes improvements each company could practically implement on a stand-alone basis. (CCFF ¶¶ 939-40). Finally, it fails to specify how or the extent to which any purported best practices synergy would benefit North American customers of chloride TiO₂.

E. Only Tronox Has the Incentive and Ability to Restore and Bring Online Cristal's Inoperative Feedstock Smelter in Jazan, Saudi Arabia.

177. The Jazan slagger is an ilmenite smelting facility located in Jazan, Saudi Arabia. (Van Niekerk, 3946-47).

Response to Proposed Finding No. 177

While Complaint Counsel believes the Jazan slagger is indeed located in Jazan, Saudi Arabia, the cited testimony does not support the finding. As to the Jazan slagger being an ilmenite smelting facility, Complaint Counsel has no specific response.

178. The Jazan slagger is owned by AMIC. AMIC is a subsidiary of 50 percent Cristal, 50 percent TASNEE. TASNEE is also the owner of Cristal, so the Jazan Slagger is ultimately owned by TASNEE. (Van Niekerk, Tr. 3899-3900).

Response to Proposed Finding No. 178

Complaint Counsel has no specific response.

179. The Jazan slagger is not operational today. (Van Niekerk, Tr. 3900). Cristal started the process of commissioning the slagger in 2015, but that ultimately failed. (Van Niekerk, Tr. 3900). "In trying to do that, they had some fairly catastrophic failures, including . . . explosions." (Quinn, Tr. 2310-11).

Response to Proposed Finding No. 179

The Proposed Finding is misleading, incomplete, and factually inaccurate. As Tronox executives, Jeffrey Quinn and Willem Van Niekerk, are not the appropriate witnesses to offer facts regarding its competitor Cristal's expenditures relating to the Jazan facility. While Complaint Counsel understands, based upon other record evidence, that the Jazan slagger is not presently smelting ilmenite, Mr. Van Niekerk's cited testimony lacks foundation and constitutes hearsay in

that he is repeating what he “thinks” is “fairly public knowledge.” (Van Niekerk, Tr. 3900 (“I think it’s fairly public knowledge that . . . the slagging is not operational.”)).

Further, while Complaint Counsel understands, based upon other record evidence, that Cristal’s initial starts of the two ilmenite smelting furnaces at Jazan had to be shut down after malfunctions occurred, Mr. Van Niekerk’s cited testimony that “the commissioning didn’t go well” lacks foundation and constitutes hearsay as he is again merely characterizing something he believes is “fairly public knowledge.” (Van Niekerk, Tr. 3900).

While Complaint Counsel understands, based upon other record evidence, that Cristal started the first furnace at Jazan in 2015, Mr. Van Niekerk’s cited testimony lacks foundation as he is only speaking about his second-hand “knowledge” of Cristal’s efforts: “To the best of my knowledge, they started commissioning in 2015.” (Van Niekerk, Tr. 3900).

While complaint counsel believes that Cristal had failures in its initial efforts to start the two furnaces at Jazan, Tronox’s CEO, Jeffrey Quinn, is not an appropriate witness with any first hand knowledge of Cristal’s efforts and experiences to characterize those efforts or results. (Quinn, Tr. 2379 (Q. And as CEO, you’re not aware of the specific technical challenges that exist in restarting this Jazan facility; correct? A. I personally am not other than, you know, being briefed occasionally”)). Moreover, { [REDACTED]

[REDACTED]

[REDACTED] } (PX7018 (Trabzuni, Dep.

at 44-45) (*in camera*)).

180. The Jazan slagging is “a facility that Cristal had spent hundreds of millions of dollars on and had not been able to get . . . running properly. (Quinn, Tr. 2310-11). [REDACTED]

[REDACTED]

Response to Proposed Finding No. 180

The Proposed Finding is misleading and incomplete. As Tronox executives, Jeffrey Quinn and Willem Van Niekerk, are not the appropriate witnesses to offer facts regarding its competitor Cristal's expenditures relating to the Jazan facility. However, Mark Stoll, Tasnee's General Manager of Mergers and Acquisitions, testified at his deposition that { [REDACTED]

[REDACTED] } (PX7009 (Stoll, Dep. at 033) (*in camera*); CCF ¶ 910).

181. Tronox "ha[s] an extraordinarily high level of confidence in our ability to deliver and exceed the specific synergies with respect to . . . Jazan." (Mancini, Tr. 2795). Tronox has "done the due diligence" and "we are very confident that we will get the slagger up and running." (Van Niekerk, Tr. 3901-02).

Response to Proposed Finding No. 181

The Proposed Finding is misleading, incomplete, and contrary to the weight of the evidence. Tronox executives' self-serving assertions about Tronox's confidence in its ability to achieve Jazan synergies by getting Jazan up and running should be given no weight, as they are indicative of nothing but Tronox's vague intention and hopes. Tronox's intentions and internal predictions of success do not prove anything about whether Tronox will, in fact, get Jazan running and achieve the Jazan synergies Tronox has forecast. As Complaint Counsel's expert witness Dr. Zmijewski explained, statements of opinion based upon business judgment are not verifiable. (Zmijewski, Tr. 1464-65 (*in camera*)).

Moreover, the assertion that Tronox is confident that it will succeed in getting Jazan running is contradicted by the weight of the evidence. (CCFF ¶¶ 898-908). The very fact that Tronox sought an option agreement contingent upon getting the Jazan facility working at a high and sustainable output level rather than simply buying the facility shows that Tronox believes the viability of the Jazan plant is highly uncertain. (CCFF ¶¶ 898-902; PX1281 at 010 (Tronox August

2017 Update) ([REDACTED]
 [REDACTED]) (*in camera*); PX1280 at 003 (Van Niekerk email attaching integration slides)
 ([REDACTED]
 [REDACTED]) (*in camera*); PX1286 at 012 (Strategic Planning for the Integrated Company, Mar.
 2017) ([REDACTED]
 [REDACTED]) (*in camera*).

182. Tronox also has strong incentive to get Jazan up and running. (Van Niekerk, Tr. 3901-02). Tronox “needs this output from the Jazan slagger” to feed the newly acquired pigment plants because after the transaction, Tronox will be short of high-grade feedstock. (Van Niekerk, Tr. 3901-02, 3945-46).

Response to Proposed Finding No. 182

The Proposed Finding is misleading and contradicted by the weight of the evidence. It is misleading in that it asserts that Tronox “needs” the feedstock output from the Jazan plant. (PX7007 (Van Niekerk, IHT at 198) ([REDACTED]
 [REDACTED]
 [REDACTED]) (*in camera*)). Cristal is successfully running its pigment plants today without Jazan producing anything. (PX7006 (Stoll, IHT at 114) ([REDACTED]
 [REDACTED]) (*in camera*)). Indeed, [REDACTED]
 [REDACTED]] (PX7038 (Van Niekerk. Dep. at 18-19, 23-30) (*in camera*)). Post-merger, Tronox could likewise buy feedstock on the open market to supply the Cristal pigment plants. [REDACTED]
 [REDACTED]
 [REDACTED]] (PX7038 (Van Niekerk. Dep. at 98-99) (*in camera*); PX7007 (Van Niekerk, IHT at 114-17, 231) (*in camera*)). Further, [REDACTED]

[REDACTED] } (PX7038 (Van Niekerk. Dep. at 29) (*in camera*)).

183. Tronox already has raw material to use in the smelter, including a large pile of ilmenite and currently untapped mines. Tronox currently has an unused stockpile of “about three and a half million tons” of ilmenite at a facility in South Africa. (Van Niekerk, Tr. 3941-42). Once the Jazan smelter is operational, Tronox plans to use that existing stockpile of ilmenite to feed the Jazan slagging. (Van Niekerk, Tr. 3953-55). Tronox also has mines that are scheduled to come online in the future that it can bring online quicker to use in the Jazan slagging. (Van Niekerk, Tr. 3953-55). If needed, Tronox can also purchase ilmenite on the open market to feed the Jazan slagging. (Van Niekerk, Tr. 3953-55).

Response to Proposed Finding No. 183

These statements in the Proposed Finding concerning Tronox’s potential sourcing of ilmenite inputs as may eventually be required for the Jazan slagging if it can be made to run successfully are irrelevant. { [REDACTED]

[REDACTED] } (PX0005 at 033 (Tronox Synergies White Paper) (*in camera*)).

184. There are many synergies that Tronox can realize at Jazan: the first involve the feedstock synergies, which have been publicly announced; second, there are additional synergies that stem from the combined entity’s ability to produce slag at a lower cost per ton, finally, the combined entity will enjoy a nonfinancial synergy stemming from the reliability of feedstock production. (Mancini, Tr. 2792-94).

Response to Proposed Finding No. 184

The Proposed Finding is misleading and incomplete. Mr. Mancini admitted at trial that he has only general, and not specific, knowledge of Tronox’s contemplated Jazan efficiencies. (Mancini, Tr. 2791-92). His testimony regarding Jazan, therefore, should be given little weight. Further, to the extent the efficiencies Mr. Mancini is purporting to identify are based upon business judgment by Tronox executives, and are therefore unverifiable, they should be given no weight by the Court. (Zmijewski, Tr. 1464-65 (*in camera*)).

The Proposed Finding is misleading to the extent it leaves out the fact that the first category of purported synergies, the “feedstock synergies,” are “relatively modest.” (Mancini, Tr. 2792).

With respect to the “second” category, the asserted “ability to produce slag at a lower cost per ton,” the finding lacks foundation and is misleading. It lacks foundation as Mr. Mancini has no personal knowledge of the ultimate cost per ton that might be realized at Jazan. It is misleading in that it leaves out the predicate clause in Mr. Mancini’s testimony: “To the extent that Tronox can assist Cristal in commissioning and operating the Jazan smelter” (Mancini, Tr. 2793). In short, Mr. Mancini’s testimony is mere speculation that *if* Tronox can help Cristal make Jazan run well, Jazan *might* produce slag at a cost per ton that is below merchant market prices.

The third and final category asserted: “a non-financial synergy stemming from the reliability of feedstock production,” is unsubstantiated hearsay based upon Mr. Mancini’s report that unspecified customers “have advised” Tronox that they value Tronox’s vertical integration. (Mancini, Tr. 2793-94). Tronox did not call any customers or other industry participants to offer their views of the claimed efficiencies at the trial.

a. Cristal Has Failed to Successfully Bring the Jazan Slagger Online by Itself.

185. [REDACTED]

Response to Proposed Finding No. 185

{ [REDACTED] } (Stoll, Tr. 2125 (*in camera*)). During his deposition in this case, Mr. Stoll, { [REDACTED] } (PX7006 (Stoll, IHT at 9-10) ({ [REDACTED] } (in camera)), admitted that { [REDACTED] }

[REDACTED]

[REDACTED]

[REDACTED] } (PX7009 (Stoll, Dep. at 194-96) (*in camera*)). [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 924-27).

The second half of the Proposed Finding regarding third parties is incomplete and misleading in that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX1196 at 002 (Tronox executive Willem Van Niekerk reporting to his CEO that [REDACTED]

[REDACTED] } (*in camera*)). [REDACTED]

[REDACTED] } (CCFF ¶¶ 913-19). [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX7018 (Trabzuni, Dep. at 85-87) (*in camera*); PX7007 (Van Niekerk, IHT at 245) ([REDACTED]

[REDACTED]
[REDACTED] } (in camera)).

186. Cristal encountered significant problems with the furnaces when they attempted to commission the Jazan slagger in 2015—those issues have continued through today and the Jazan slagger is still not operational. (Van Niekerk, Tr. 3900).

Response to Proposed Finding No. 186

The citation Respondent’s offer for this Proposed Finding does not support it. Willem Van Niekerk, a Tronox executive, is not the best witness to characterize its competitor Cristal’s efforts and experiences with regard to the Jazan smelter, and is only able to offer, on the page cited, the general assertion that: “I think it’s fairly public knowledge that the commissioning didn’t go well, and currently, the slagger is not operational.” (Van Niekerk, Tr. 3900).

187. [REDACTED]
[REDACTED]

Response to Proposed Finding No. 187

The Proposed Finding is incomplete, misleading, and factually inaccurate. [REDACTED]
[REDACTED]
[REDACTED] } (PX7018 (Trabzuni, Dep. at 44-45, 62-63, 72) (in camera)). The Proposed Finding is misleading in that it fails to mention that Cristal was already addressing these issues before Tronox got involved. For example, [REDACTED]
[REDACTED] } (PX7038 (Van Niekerk. Dep. at 71) ([REDACTED]
[REDACTED] } (in camera)). [REDACTED]
[REDACTED] } (PX7018 (Trabzuni, Dep. at 46) (in camera)).

188. Both of Jazan’s furnaces “are still down” since their failure to operate. Cristal has tried to address Jazan’s flaws. (Stoll, Tr. 2113). Cristal “attempted . . . but the furnaces are still down.” (Stoll, Tr. 2113).

Response to Proposed Finding No. 188

The Proposed Finding is misleading to the extent it implies that there is something unusual about months or years going by before an ilmenite smelting furnace can be successfully restarted after a failure during an early attempt. Indeed, Tronox’s Willem Van Niekerk explained that:

{ [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] }

(PX7038 (Van Niekerk. Dep. at 54-55) (*in camera*)).

The Proposed Finding is also misleading to the extent it implies that Cristal’s failure to have already started the furnaces is somehow evidence that they could not do so. This is contrary to the weight of the evidence which shows that { [REDACTED]

[REDACTED]
[REDACTED] } (CCFF ¶¶ 909-32).

189. [REDACTED]

Response to Proposed Finding No. 189

The Proposed Finding is incomplete, misleading, and factually inaccurate. The opinion testimony of Dr. Van Niekerk, a Tronox executive who was not involved in Cristal's commissioning process for the Jazan smelter, is unreliable and entitled to little weight. He was not qualified as an expert in this matter, and to the extent he is offering these highly technical opinions, he did not describe the basis for those opinions in any expert report, and such opinions have not been reviewed or responded to by an opposing expert, making such opinion testimony unreliable. { [REDACTED]

[REDACTED] } (PX7018 (Trabzuni, Dep. at 44-45, 62-63, 72) (*in camera*)).

To last sentence of the Proposed Finding is misleading to the extent { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 909-32).

190. [REDACTED]

[REDACTED]

Response to Proposed Finding No. 190

The Proposed Finding is incomplete, misleading, and factually inaccurate. The opinion testimony of Dr. Van Niekerk, a Tronox executive who was not involved in Cristal's commissioning process for the Jazan smelter, is unreliable and entitled to little weight. He was not qualified as an expert in this matter, and to the extent he is offering these highly technical

opinions, he did not describe the basis for those opinions in any expert report, and such opinions have not been reviewed or responded to by an opposing expert, making such opinion testimony unreliable.

The Proposed Finding is misleading in that { [REDACTED]

[REDACTED]

[REDACTED] } (PX7038 (Van Niekerk, Dep. at 71) ({ [REDACTED]

[REDACTED] }) (*in camera*)).

191. [REDACTED]

Response to Proposed Finding No. 191

The Proposed Finding is incomplete, misleading, and factually inaccurate. The opinion testimony of Dr. Van Niekerk, a Tronox executive regarding refractory brick handling at the Jazan smelter, is unreliable and entitled to little weight. He was not qualified as an expert in this matter, and to the extent he is offering these highly technical opinions, he did not describe the basis for those opinions in any expert report, and such opinions have not been reviewed or responded to by an opposing expert, making such opinion testimony unreliable.

Further, { [REDACTED]

[REDACTED]

[REDACTED] } (PX7018 (Trabzuni, Dep. at 65) ({ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] }) (*in camera*)).

192.

[REDACTED]

Response to Proposed Finding No. 192

The Proposed Finding is incomplete, misleading, and vague. The opinion testimony of Dr. Van Niekerk, a Tronox executive regarding design issues at the Jazan smelter, is unreliable and entitled to little weight. He was not qualified as an expert in this matter, and to the extent he is offering these highly technical opinions, he did not describe the basis for those opinions in any expert report, and such opinions have not been reviewed or responded to by an opposing expert, making such opinion testimony unreliable.

The Proposed Finding is also vague and misleading in that { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] .} (PX7038

(Van Niekerk. Dep. at 71-72) ({ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] }) (*in camera*)).

b. Tronox Has World-Class Expertise and Highly Skilled Operators for Jazan.

193. Tronox has a “unique” skill-set for operating the Jazan slagger. (Quinn, Tr. 2357-59). Tronox has “a number” of “really highly skilled operating people” as it relates to Jazan. (Quinn, Tr. 2357-59). [REDACTED]

Response to Proposed Finding No. 193

The Proposed Finding is contrary to the weight of the evidence showing that [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 913-20; Van Niekerk, Tr. 3984-85, 3989-91, 3993 (*in camera*)).

[REDACTED]

[REDACTED] } (CCFF ¶¶ 912-28; PX2295 at 064, 068 (Cristal Presentation) ([REDACTED]

[REDACTED]) (*in camera*)). Further, Tronox’s assertion in the Proposed Finding that ilmenite smelters require “‘unique’ expertise” runs contrary to its own statement that [REDACTED]

[REDACTED] } (CCFF ¶ 929 (citing PX1373 at 004 ([REDACTED]

[REDACTED])) (*in camera*)).

194. Tronox’s highly skilled operators for Jazan who will be assisting with the Jazan plant include two of the world’s “foremost experts” in the area of feedstock and smelting: Dr. Willem Van Niekerk and Jean-Francois Turgeon. (Quinn, Tr. 2357-58; Mancini, Tr. 2798-99).

- a. Dr. Van Niekerk, Tronox’s Senior Vice President of Strategy, has a Ph.D. in pyrometallurgy. (Van Niekerk, Tr. 3899, 3903). Dr. Van Niekerk was “in charge of the team that designed the smelter at KZN.” (Van Niekerk, Tr. 3926-27).
- b. Mr. Turgeon, Tronox’s Chief Operating Officer, is the holder of a patent for smelting titanium dioxide. (Mancini, Tr. 2796-98; Turgeon, Tr. 2584-85). Mr. Turgeon is the inventor of the UGS high-grade feedstock at Rio Tinto and designed and developed the furnaces that Rio Tinto currently operates in Quebec. (Mancini, Tr. 2798-99).
- c. Mr. Neels Oosterhuis will manage Jazan on a day-to-day basis. (Van Niekerk, Tr. 3951-52). Mr. Oosterhuis “has a long history of ilmenite smelting.” (Van Niekerk, Tr. 3952). He “was previously the manager of [Tronox’s] Namakwa smelter” and “was

also the manager at [Tronox's] KZN smelter.” (Van Niekerk, Tr. 3952). Mr. Oosterhuis is “probably the only guy in the world who has run two different ilmenite smelters.” (Van Niekerk, Tr. 3952).

Response to Proposed Finding No. 194

The first sentence of the Proposed Finding, wherein two Tronox executives offer their opinions that two other Tronox executives are “foremost experts” in feedstock and smelting, must be rejected as unsupported opinion testimony. Moreover, neither Mr. Van Niekerk nor Mr. Turgeon were qualified as expert witnesses or offered expert reports in this matter.

Complaint Counsel has no specific response to the recitations of the backgrounds Dr. Van Niekerk and Mr. Oosterhuis. However, Mr. Mancini’s testimony that Mr. Turgeon “designed and developed” the Rio Tinto furnaces in Quebec is unreliable hearsay. (Mancini, Tr. 2798-99). Mr. Mancini did not work at Rio Tinto, and would have no apparent first hand knowledge of what Mr. Turgeon’s role and responsibilities were at Rio Tinto. (Mancini, Tr. 2741-42 (detailing work experience)).

195. Tronox has extensive experience running slaggers. (Quinn, Tr. 2357-59; Stoll, Tr. 2113-14). Tronox’s two smelters in South Africa (Namakwa and KZN) have several key similarities to the furnaces at Jazan, including:

- a. “they use electricity to put heat into the furnaces”;
- b. “they charge through the roof into the furnace”;
- c. they both “have slag and metal tapholes”;
- d. they “operate at the same temperatures”; and
- e. they all have “the same thermodynamic and chemical processes that happen inside the furnace.”

(Van Niekerk, Tr. 3950).

Response to Proposed Finding No. 195

The Proposed Finding is misleading in that it fails to mention { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX7038 (Van Niekerk, Dep. at 106) ({ [REDACTED]

[REDACTED]

[REDACTED] } (in camera); PX7038 (Van Niekerk. Dep. at 43-44) ([REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (in camera); PX7014 (Quinn,
Dep. at 75) ([REDACTED] } (in camera); see
generally CCFF ¶ 905 (citing PX2177 at 026 ([REDACTED]
[REDACTED] } (in camera)).

196. Tronox operates “four furnaces in South Africa in two different locations, so [Cristal] is very confident [Tronox] ha[s] the people and the capability to assist (Cristal).” (Stoll, Tr. 2114).

Response to Proposed Finding No. 196

The Proposed Finding is vague and misleading, referring only generally to the concept that Tronox can “assist” Cristal but not explaining how. But whether Tronox “assists” Cristal, [REDACTED]
[REDACTED] } (see CCRRFF ¶
195, above), [REDACTED]
(CCFF ¶¶ 898-908) and [REDACTED]
[REDACTED] } (CCFF ¶¶ 909-
32).

In addition, Mr. Mark Stoll is not qualified to judge Tronox’s capabilities with regard to the technical aspects of ilmenite smelting or Cristal’s technical needs at Jazan. Mr. Stoll’s vague “confidence” in Tronox is based only on the fact that Tronox operates furnaces generally, but on its face does not take into account the differences between those furnaces and the Jazan slagger. (See CCRRFF ¶ 195, above). During his deposition in this case, [REDACTED]

[REDACTED] } (PX7009 (Stoll, Dep. at 194-96) (*in camera*)).

Furthermore, { [REDACTED] } (Zmijewski, Tr. 1464-65 (*in camera*)).

197. Ilmenite smelters like the Jazan slagger require “unique” expertise to operate and maintain effectively. (Van Niekerk, Tr. 3931-33, 3957). The “fundamentals of ilmenite smelting” are “totally different than any other smelting process.” (Van Niekerk, Tr. 3931-33). The process is “virtually on a knife’s edge the whole time” which requires second-by-second monitoring of “power, ilmenite and anthracite.” (Van Niekerk, Tr. 3931-33). In most other smelting processes, the metal is the final product and the “slag is there to assist you, to act as an insulating layer, to act as a sink for impurities and to take out things that you don’t want in a metal.” (Van Niekerk, Tr. 3931-33). In ilmenite smelting, “the slag has a total[ly] different role than [in] any other pyrometallurgical process,” because in ilmenite smelting, the slag is the “main product.” (Van Niekerk, Tr. 3931-33).

Response to Proposed Finding No. 197

The Proposed Finding is vague and misleading. The opinion testimony of Dr. Van Niekerk, a Tronox executive, regarding the nature of ilmenite smelting is unreliable and entitled to little weight. He was not qualified as an expert in this matter, and to the extent he is offering these highly technical opinions, he did not describe the basis for those opinions in any expert report, and such opinions have not been reviewed or responded to by an opposing expert, making such opinion testimony unreliable.

The Proposed Finding is vague in that “unique” is undefined and essentially meaningless.

{ [REDACTED] } (CCFF ¶¶ 913-20). Further, Tronox’s assertion in this Proposed Finding that ilmenite smelters require “unique’ expertise” runs contrary to its own statement that

[REDACTED] } (CCFF

¶ 929 (*citing* PX1373 at 004 ([REDACTED] } (in camera)).

198. Ilmenite smelters are heated using an electrical conductive arc between two electrodes which is “sort of [like a] lightning strike or lightning that’s continuously there.” (Van Niekerk, Tr. 3928-30). This electric arc generates heat up to 7,000 degrees Celsius. (Van Niekerk, Tr. 3928-30). This intense heat smelts “the ilmenite to produce titanium slag and liquid iron.” (Van Niekerk, Tr. 3928-30). Smelting is not the same as melting — smelting includes both melting and “chemical work.” (Van Niekerk, Tr. 3928-30). In the smelters, Tronox “transform(s) the ilmenite from mineral into titania slag, as well as . . . heat it up and melt it.” (Van Niekerk, Tr. 3928-30). As Dr. Van Niekerk described: “You can think of this furnace as a little volcano” “Mother Nature took millions and millions of years” to make ilmenite, and Tronox is “reversing that in minutes to make (it into) titanium and iron again.” (Van Niekerk, Tr. 3928-30).

Response to Proposed Finding No. 198

Complaint Counsel has no specific response.

199. Inside the smelter, the “slag is a little bit lighter than the iron, so it floats on top of the iron.” (Van Niekerk, Tr. 3933-35). Material is removed from the furnace through a hole in the furnace called a “taphole” which is a hole in the side of the furnace. (Van Niekerk, Tr. 3933-35; RXD-0036). Taphole operators will open those holes and “will then manage that whole process to get the liquid out, either into slag pots or into the metal ladle.” (Van Niekerk, Tr. 3933-35). At Namakwa and KZN, when the titania slag comes out of the smelter, it is placed into bell-shaped pots, cooled, removed from the pots, crushed, and ultimately shipped around to Tronox’s pigment plants around the world. (Van Niekerk, Tr. 3937-39). After the iron is removed from the furnace through its taphole, it is tapped into a ladle, treated, cast into small blocks called “pigs,” and sold around the world to be used in end-uses such as engine blocks. (Van Niekerk, Tr. 3939-40).

Response to Proposed Finding No. 199

Complaint Counsel has no specific response.

c. Tronox Conducted Extensive Technical Due Diligence for Jazan.

200. Tronox has conducted “extensive technical diligence” related to the Jazan slagger. (Van Niekerk, Tr. 3943). This includes Tronox’s “significant field visits” to Jazan. (Quinn, Tr. 2357-58).

Response to Proposed Finding No. 200

The Proposed Finding is vague and misleading. Although the record supports a finding that Tronox has visited and studied the Jazan smelter operation, the characterizations of those

efforts as “extensive” or “significant” in the Proposed Finding are vague, conclusory, and subjective matters of opinion, not facts. The evidentiary record of what Tronox has done with respect to diligence and site visits related to Jazan speaks for itself, and Respondents have provided no evidence or explanation as to how the claimed diligence or site visits are “extensive” or “significant” as compared to any other typical diligence process.

201. Dr. Van Niekerk and others from Tronox first visited the slagging in “late 2016” and “spent a few days at the slagging.” (Van Niekerk, Tr. 3944-45). Tronox “requested a number of reports” related to the Jazan slagging and “[a]ll of those reports were posted” in the data room. (Van Niekerk, Tr. 3944-45). Tronox’s due diligence related to the Jazan slagging also included a week-long workshop with the designers of the furnace, Outotec. (Van Niekerk, Tr. 3944-45). In total, Dr. Van Niekerk and a team from Tronox visited the Jazan site three times to conduct further due diligence. (Van Niekerk, Tr. 3944-45).

Response to Proposed Finding No. 201

Complaint Counsel has no specific response.

202. Dr. Van Niekerk also oversaw Tronox’s participation in workshops “to identify all the areas where Jazan need[ed] Tronox to get the slagging commissioned.” (Van Niekerk, Tr. 3951).

Response to Proposed Finding No. 202

The Proposed Finding is misleading and inaccurate. The full and accurate quote is: “*Part of one of the workshops that we had at Jazan was to identify all the areas where Jazan need Tronox to get the slagging recommissioned.*” (Van Niekerk, Tr. 3951 (emphasis added)). Thus, the testimony is that this effort constituted not “workshops,” plural, but merely “part of one of the workshops.” In addition, the testimony uses the term “recommissioned,” as opposed to Respondent’s inaccurate “commissioned,” as { [REDACTED] } (PX7018 (Trabzuni, Dep. at 44-47) (*in camera*)).

d. The Transaction Includes an Option Agreement for Tronox’s Acquisition of the Jazan Slagging.

203. The Jazan slagger has been a part of the overall deal with Cristal from the beginning. (Quinn, Tr. 2316). Tronox “always considered” the Jazan slagger to be “part of the transaction.” (Quinn, Tr. 2316; RX0236). The first time Tronox CEO Tom Casey told the Tronox Board of Directors about the potential Cristal transaction, he mentioned the Jazan slagger and Tronox’s plan to enter into an option agreement. (Quinn, Tr. 2310-11; RX0236).

Response to Proposed Finding No. 203

The Proposed Finding is contrary to the weight of the evidence showing that the slagger was *not* part of the merger agreement and indeed, that, even today, there is no certainty that Tronox will ever purchase Jazan. (CCFF ¶¶ 898-902; Quinn, Tr. 2375 (when asked if Tronox will ultimately buy Jazan, Mr. Quinn responded: “No. I think there’s – there’s no certainty that that will actually occur.”)). Mr. Quinn also admitted at trial that the purchase price of the transaction did not incorporate the slagger. (Quinn, Tr. 2378). { [REDACTED]

[REDACTED] } (PX7006

(Stoll, IHT at 70) (*in camera*)). { [REDACTED]

[REDACTED] } (PX7006 (Stoll, IHT at 71) (*in camera*)).

204. Tronox ultimately entered into two agreements with AMIC related to the Jazan slagger: an option agreement and a technical services agreement (“TSA”). (Van Niekerk, Tr. 3900-01). In the agreement that sets up the overall transaction, Tronox and Cristal agreed to negotiate and ultimately enter into an option agreement related to the Jazan slagger. (Van Niekerk, Tr. 3900-01, 3945-46). While Tronox and Cristal were still negotiating the specifics of the Jazan slagger option agreement, Tronox entered into a TSA to help Cristal commission the slagger. (Van Niekerk, Tr. 3901).

Response to Proposed Finding No. 204

The Proposed Finding is misleading in that it neglects to mention that in the cited testimony, Mr. Van Niekerk specifies why the merger agreement does *not* include the Jazan

slagger: namely, Tronox did not have the money to purchase it, and the slagger was not proven to even work. (Van Niekerk, Tr. 3945-46). Furthermore, { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (Van Niekerk, Tr. 3970-71, 3977-81 (*in camera*); CCF 898-908).

205. [REDACTED]

[REDACTED] Under the option agreement, Tronox has a five-year option to acquire. (Van Niekerk, Tr. 3901).

Response to Proposed Finding No. 205

Complaint Counsel has no specific response.

206. [REDACTED]

[REDACTED]

Response to Proposed Finding No. 206

The Proposed Finding is incorrect and misleading. { [REDACTED]

[REDACTED]

[REDACTED] } (Van Niekerk, Tr. 3980-81 (*in camera*)). { [REDACTED]

[REDACTED]

[REDACTED] } (CCF 898-908).

207. The option agreement is connected to and dependent on the larger Tronox-Cristal transaction. (Quinn, Tr. 2376). At the time the parties “signed the original merger agreement, the terms of the merger required that the parties would negotiate in good faith to later complete and execute this option agreement.” (Quinn, Tr. 2376). Indeed, Tronox “would have never entered into this agreement if the big merger agreement didn’t exist.” (Quinn, Tr. 2378).

Response to Proposed Finding No. 207

The Proposed Finding is vague and contrary to the weight of the evidence. Complaint Counsel has reviewed the merger agreement, PX0009, and can find no mention of the word “Jazan,” “Slagger,” “Smelter,” or any provision contemplating the negotiation of an option agreement to purchase Cristal’s Jazan facility. Mr. Quinn’s assertions, without citation to an actual provision in the agreement, therefore, are contradicted by the actual contemporaneous business document. Furthermore, Mr. Quinn, himself, admitted when asked if Tronox will ultimately buy Jazan, that “No. I think there’s – there’s no certainty that that will actually occur.” (Quinn, Tr. 2375).

208. An option agreement rather than an outright purchase of the Jazan slagger was proposed because: the slagger “hadn’t worked,” but would be “really valuable” if it did work. (Quinn, Tr. 2311-12). Tronox proposed entering the option agreement because “we had to give our board comfort that we would not buy something that was not operational.” (Van Niekerk, Tr. 3945-46).

Response to Proposed Finding No. 208

The Proposed Finding is vague, incomplete, and contrary to the weight of the evidence. In his deposition, for example, Dr. Van Niekerk made it clear that { [REDACTED] [REDACTED] } { [REDACTED] [REDACTED] } (PX7038 (Van Niekerk, Dep. at 74-75) (*in camera*)). In attempting to explain why there is only an option agreement instead of an outright purchase agreement, Respondents have themselves demonstrated that there was no agreement to purchase the Jazan slagger and there still is not, because it remains to be seen whether the Jazan facility can be made operational. (Quinn, Tr. 2375 (when asked if Tronox will ultimately buy Jazan, Mr. Quinn responded: “No. I think there’s – there’s no certainty that that will actually occur.”)).

209. Furthermore, Tronox did “not have enough cash to do an all-cash deal which includes the slagger.” (Van Niekerk, Tr. 3945-46).

Response to Proposed Finding No. 209

The Proposed Finding is vague in that it fails to provide any details of the Tronox cash situation or requirements. Moreover, the Proposed Finding is irrelevant in that the issue is *why* the slagger might not otherwise have been included, but indeed, that it was admittedly *not* included. The cited testimony does support the conclusion that that the slagger was not part of the merger. (CCFF ¶ 891).

210. It is “not uncommon at all for there to be ancillary documents as part of . . . a big merger that get done after the fact.” (Quinn, Tr. 2312-13). “Usually they’re technical services agreements or transition services . . . I’ve seen situations with creative ways of bridging value that, you know, have been incorporated into the deal, and I think this is just an example of that.” (Quinn, Tr. 2312-13).

Response to Proposed Finding No. 210

The Tronox CEO’s unsupported opinions and anecdotal hearsay experiences in other unspecified deals should be given no weight.

The Proposed Finding is vague in that it provides no specifics of the other situations the Tronox CEO is referring to or how they are appropriately considered as analogous to the Jazan Option Agreement. Moreover, the weight of the evidence amply demonstrates that the purchase of the Jazan facility was not part of the merger agreement and remains highly uncertain and speculative. (CCFF ¶¶ 891-93, 898-907).

211. Tronox entered into the TSA to make sure Tronox “actually acquire[s] a working, operational slagger.” (Van Niekerk, Tr. 3951). For Tronox, “it was critical” to enter into a “technical services agreement in order to assist Cristal to get the Jazan slagger recommissioned because [Tronox] want[s] to buy it.” (Van Niekerk, Tr. 3951). Tronox was concerned that since Cristal personnel “previously were not successful to start up the slagger” that if Cristal tried to start the furnace with Tronox’s help, Cristal “might again run into difficulties.” (Van Niekerk, Tr. 3951). Tronox “would never have helped Jazan if it wasn’t for the transaction.” (Van Niekerk, Tr. 3961).

Response to Proposed Finding No. 211

The Proposed Finding is vague, incomplete, and misleading. Tronox has admitted that it may or may not succeed in getting Jazan operational. (Van Niekerk, Tr. 4001-02; Quinn, Tr. 2375; CCFF ¶¶ 898-902). In addition, Tronox cannot know whether Cristal may have succeeded on its own or with help from various third-parties. Indeed, { [REDACTED] } (CCFF ¶¶ 909-32). Further, Tronox’s statements to the effect that Cristal would find it difficult to successfully recommission Jazan without Tronox’s assistance run contrary to its own statement that { [REDACTED] } (CCFF ¶ 929 (citing PX1373 at 004 ({ [REDACTED] }) (in camera))).

212. Under the TSA, Tronox has begun investing substantial financial resources in addition to its technical knowledge. Furthermore, “almost immediately after [the TSA] agreement was signed, [Tronox] began training personnel;” maintaining onsite presence; consulting with Cristal on Jazan’s design issues; and “[m]a[king] several significant contributions and suggestions for doing things differently” (Quinn, Tr. 2426).

Response to Proposed Finding No. 212

The Proposed Finding is incomplete, misleading, and contrary to the weight of the evidence to the extent it is suggesting that Tronox is the only available source for these categories or assistance at Jazan. { [REDACTED] } (CCFF ¶¶ 909-32; Van Niekerk, Tr. 3984-85, 3989-91, 3993 (in camera)). Further, Tronox’s statements to the effect that Cristal would find it difficult to successfully recommission Jazan without Tronox’s assistance run contrary to its own statement that { [REDACTED] } (CCFF ¶ 929 (citing PX1373 at 004 ({ [REDACTED] }) (in camera))).

213. As part of the TSA, Tronox has been providing practical, on-the-job training for the operators of the Jazan slagger. (Van Niekerk, Tr. 3955). This practical, on-the-job training is “a very important part of the TSA” because “one of the deficiencies” Tronox found at Jazan was that “they’ve never operated smelters before.” (Van Niekerk, Tr. 3955). Tronox has already started the practical, on-the-job training. (Van Niekerk, Tr. 3955-56).

Response to Proposed Finding No. 213

The Proposed Finding is incomplete, misleading and contradicted by the weight of the evidence to the extent it is suggesting that Tronox is the only available source for these categories or assistance at Jazan. { [REDACTED]

[REDACTED] }
 (CCFF ¶¶ 909-32; Van Niekerk, Tr. 3984-85, 3989-91, 3993 (*in camera*); PX7018 (Trabzuni, Dep. at 112-13) (*in camera*)). Additionally, the assertion that Tronox’s training is required in order for Cristal to make the slagger operational is contrary to its own assessment that [REDACTED] [REDACTED] } (CCFF ¶ 929 (*citing* PX1373 at 004 ({ [REDACTED] }) (*in camera*))).

214. Tronox has been providing Cristal tap room operators “the exact same training” that Tronox provides its own tap floor operators. (Van Niekerk, Tr. 3956-57). The training has been happening in South Africa on location at Tronox’s two smelters at Namakwa and KZN. (Van Niekerk, Tr. 3956). Tronox has a four-week training for tap floor operators that “involves a little bit of theoretical training, lots of safety training, and then physical, on-the-job training.” (Van Niekerk, Tr. 3956-57). The “first group of tap floor operators have already been trained, declared competent and went back to the Kingdom.” (Van Niekerk, Tr. 3956-57). Tronox also trained the metallurgists and the plant managers for two weeks in South Africa. (Van Niekerk, Tr. 3956-58). Tronox is providing “thorough theoretical and practical on-the-job training” for control room operators who are “in charge of that furnace 24/7.” (Van Niekerk, Tr. 3957-58). Tronox is also providing training for the Jazan maintenance people because the “maintenance requirements on an ilmenite smelter (are) unique.” (Van Niekerk, Tr. 3957-58). Tronox is providing metal treatment training on how to properly treat the iron because “[i]f you have problems at your metal treatment station station, it can prevent the furnace from running at full capacity.” (Van Niekerk, Tr. 3957-58).

Response to Proposed Finding No. 214

The Proposed Finding is incomplete, misleading and contradicted by the weight of the evidence to the extent it is suggesting that Tronox is the only available source for these categories or assistance at Jazan. { [REDACTED] }
 [REDACTED]
 [REDACTED] } (Van Niekerk, Tr. 3984-85, 3989-91, 3993 (*in camera*)). Further, Cristal had been working on its own, and with third parties, to address the technical issues at Jazan. (CCFF ¶¶ 912-31). Additionally, the assertion that Tronox’s training is required in order for Cristal to make the slagger operational is contrary to its own assessment that { [REDACTED] }
 [REDACTED] } (CCFF ¶ 929 (*citing* PX1373 at 004 ({ [REDACTED] }) (*in camera*))).

215. In the future, Tronox plans “to rotate Saudi people into South Africa, South Africa people into the Jazan slagger, and in that way . . . keep everybody competent.” (Van Niekerk, Tr. 3959-60).

Response to Proposed Finding No. 215

The Proposed Finding is incomplete, misleading and contradicted by the weight of the evidence to the extent it is suggesting that Tronox is the only available source for these categories or assistance at Jazan. { [REDACTED] }
 [REDACTED] } (Van Niekerk, Tr. 3984-85, 3989-91, 3993 (*in camera*)). Further, { [REDACTED] }
 [REDACTED] } (CCFF ¶¶ 912-31). Additionally, the assertion that Tronox’s training is required in order for Cristal to make the slagger operational is contrary to its own assessment that { [REDACTED] }
 [REDACTED] } (CCFF ¶ 929 (*citing* PX1373 at 004 ({ [REDACTED] }) (*in camera*))).

216. Stand-alone Cristal cannot give similar training to their people because they do not currently run an ilmenite smelter and “bought this Jazan slagger as a turnkey project from Outotec.” (Van Niekerk, Tr. 3958-59).

Response to Proposed Finding No. 216

The Proposed Finding is vague and contrary to the weight of the evidence. { [REDACTED]

[REDACTED] } (PX2205 at 008 (Cristal Presentation) (*in camera*); PX7018 (Trabzuni, Dep. at 112-13) (*in camera*)). { [REDACTED]

[REDACTED] } (Van Niekerk, Tr. 3984-85, 3989-91, 3993 (*in camera*)). Further, { [REDACTED]

[REDACTED] } (CCFF ¶¶ 912-31). { [REDACTED]

[REDACTED] } (PX2295 at 003-88 (Cristal Presentation) (*in camera*)). Additionally, the assertion that Tronox’s training is required in order for Cristal to make the slagger operational is contrary to its own assessment that { [REDACTED]

[REDACTED] } (CCFF ¶ 929 (*citing* PX1373 at 004 ({ [REDACTED] } (in camera))).

217. If the Tronox-Cristal transaction does not go forward, “both the technical services agreement and the option agreement will lapse immediately because they are part and parcel of the bigger Cristal-Tronox deal.” (Van Niekerk, Tr. 3960).

Response to Proposed Finding No. 217

The Proposed Finding is incomplete and misleading. While it is true that the TSA and Option Agreement contain terms allowing them to be terminated if the merger does not proceed, this does not make the Jazan purchase option part of the merger deal. The Proposed Finding is contrary to the weight of the evidence which shows that Jazan was not part of the merger agreement

and indeed, that, even today, there is no certainty that Tronox will ever purchase Jazan. (CCFF ¶¶ 898-902; Quinn, Tr. 2375 (when asked if Tronox will ultimately buy Jazan, Mr. Quinn responded: “No. I think there’s – *there’s no certainty* that that will actually occur.”) (emphasis added)).

{ [REDACTED] } (PX7006 (Stoll, IHT at 70) (*in camera*)). { [REDACTED] }
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (PX7006 (Stoll, IHT at 71) (*in camera*)).

Further, the Proposed Finding is misleading and incomplete. Specifically, { [REDACTED] }
[REDACTED]
[REDACTED] } (PX7018 (Trabzuni, Dep. at 175) [REDACTED]
[REDACTED]
[REDACTED] } (*in camera*)). { [REDACTED] }
[REDACTED] } (CCFF ¶ 897). In addition, { [REDACTED] }
[REDACTED]
[REDACTED] } (PX1745 at 013-14, 016 (§§ 9.1-9.2 (Jazan “Work Product” and license) and 12.2 (termination and Crista’s retention of work product)) (*in camera*)).

F. The Transaction Will Generate Substantial Cost-Saving Efficiencies.

218. “[T]he proposed transaction will lead to . . . significant cost reductions.” (Shehadeh, Tr. 3441-42).

Response to Proposed Finding No. 218

The Proposed Finding is misleading and vague in that it does not quantify the amount or specify the timing of the cost reductions Dr. Shehadeh believes will result from the proposed acquisition. Dr. Shehadeh's report offers no opinion on the key question under the Horizontal Merger Guidelines of whether any claimed cost savings are cognizable (i.e., verifiable, merger-specific, and not arising from competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines)). In fact, Dr. Shehadeh's report does not even contain the words "cognizable" or "verifiable." (Zmijewski, Tr. 1430-31; CCFF ¶ 840; *see* RX0170 (Shehadeh Expert Report)). Nor does Dr. Shehadeh make any attempt to estimate or analyze the effect any claimed cost reductions will have on TiO₂ pricing in North America or any other region. (CCFF ¶ 840; *see* RX0170 (Shehadeh Expert Report)).

219. The transaction will allow Tronox to move "towards the lower cost end of the curve" which will "enable the merged entity to more effectively compete against Chemours and other low-cost producers like the Chinese." (Stern, Tr. 3790). Today, the "lowest-cost players" in the "industry globally are Chemours and Lomon Billions." (Arndt, Tr. 1406). The transaction will enhance Tronox's vertical integration and allow them to better compete against low-cost rivals. (Stern, Tr. 3790).

Response to Proposed Finding No. 219

With respect to Mr. Stern's testimony, The Proposed Finding is misleading, vague, and incomplete in that it fails to explain how enhanced vertical integration would lead to lower costs or a greater ability to compete, fails to quantify any cost reductions, and fails to address their impact on North American customers of chloride TiO₂ specifically. For example, { [REDACTED] [REDACTED] [REDACTED] } (Stern, Tr. 3886-88 (*in camera*)). Nor did Mr. Stern quantify the impact of the proposed acquisition on margins, either at the feedstock or pigment levels. (Stern, Tr. 3884). In addition, the proposed finding fails to explain how any synergies that arise from greater vertical integration would be verifiable or merger

specific as required by the Horizontal Merger Guidelines. In fact, Mr. Stern did not independently verify the magnitude of Respondents claimed synergies, or determine if any of them were merger specific. (Stern, Tr. 3879). Mr. Stern also acknowledges that the presence of Chinese TiO₂ in North America is extremely limited—approximately 91,000 metric tons in 2016—only 11% of which is chloride TiO₂. (Stern, Tr. 3873). In fact, imports of chloride TiO₂ from all producers in China account for only { } of the North American market for chloride TiO₂. (CCFF ¶ 755). With respect to Mr. Arndt’s testimony, The Proposed Finding is vague in that it does not specify what “industry” or what measure of costs he is referring to. Nor does Mr. Arndt specify whether he is referring to chloride or sulfate TiO₂. Finally, The Proposed Finding is incomplete in that it fails to acknowledge that Tronox has the ability, through increased TiO₂ production, to enhance its vertical integration absent the proposed transaction, and therefore fails to explain how its claim related to vertical integration is merger specific as required by the Horizontal Merger Guidelines.

220. The cost-saving efficiencies would also “increase[] the incentives of the postmerger firm to expand output and, as a result,” cause an “incentive to supply more to its customers, to the benefit of those customers.” (Shehadeh, Tr. 3444-45). The cost savings will partly result from increasing the output of TiO₂, which by itself moves Tronox toward the lower end of the cost curve. (Stern, Tr. 3790-91).

Response to Proposed Finding No. 220

The Proposed Finding is incomplete, misleading, and vague in that it fails to explain how the claimed cost savings will increase the incentive to expand output, fails to quantify any incentive to expand output, and fails to specify which customers would benefit. In addition, the Proposed Finding is contrary to the weight of the evidence. Specifically, since becoming vertically integrated via its acquisition of Exxaro, { } (CCFF ¶¶ 994-1002). Moreover, the court should attach little if any weight to Mr. Stern’s testimony related to this finding, as Mr. Stern did

not quantify the impact of the proposed acquisition on margins, either at the feedstock or pigment levels. (Stern, Tr. 3884). Indeed, Mr. Stern did not independently verify the magnitude of any of Respondents claimed synergies, or determine if any of them were merger specific. (Stern, Tr. 3879).

221. Tronox publicly communicated to the market a realization of \$100 million of EBITDA synergies by the end of year 1, and \$200 million by the end of year 3. (Mancini, Tr. 2800).

Response to Proposed Finding No. 221

The Proposed Finding is misleading and incomplete in that it does not address whether the synergies that Tronox announced to the “market” are cognizable, as required by the Horizontal Merger Guidelines. Complaint Counsel’s expert Dr. Zmijewski analyzed Respondents’ claimed synergies under the framework of the Horizontal Merger Guidelines and concluded that Respondents have failed to demonstrate that the claimed synergies are verifiable or merger specific, meaning Respondents have failed to demonstrate that the claimed synergies are cognizable. (CCFF ¶¶ 830-32).

222. The estimated SG&A cost savings primarily result from the reduction in personnel and so-called “third party spend,” i.e., contracts for third parties to provide needed services to the combined company. (Mancini, Tr. 2773-75). SG&A savings come from two primary areas: the first is the reduction of personnel that you don’t need, which includes the reduction of both salary as well as benefits for those employees; the second is third party spend. (Mancini, Tr. 2773-75). Tronox and Cristal both have separate HR, Finance, and executive teams that overlap and eliminating that overlap with save costs for the combined entity. (Mancini, Tr. 2773-75). Because the combination of two global organizations with corporate staffs causes “an enormous amount of overlap,” the companies can eliminate much of that overlap and generate significant savings. (Mancini, Tr. 2773-74).

Response to Proposed Finding No. 222

The Proposed Finding is vague in that it does not quantify the amount or timing of any synergy Respondents claim related to headcount reductions. It is also vague in that it fails to identify the specific amount of any “overlap” between the two companies that would purportedly

be eliminated. It is also incomplete in that it does not address the relevant antitrust question of whether the anticipated synergy is cognizable under the Horizontal Merger Guidelines. On the contrary, the synergy relies on unfounded assumptions. (CCFF ¶¶ 984-88). Accordingly, the headcount reduction synergy is not verifiable and therefore not cognizable. (CCFF ¶ 989).

223. Tronox will also realize SG&A savings from reducing third-party spend. (Mancini, Tr. 2773-75). Both Cristal and Tronox spend money hiring third parties for insurance, and communications and accounting firms. (Mancini, Tr. 2773-75). The combined entity will save costs on these services. (Mancini, Tr. 2773-75).

Response to Proposed Finding No. 223

The Proposed Finding is vague in that it does not quantify the amount or specify the timing of any synergy Respondents claim related to third-party spend. It is also incomplete in that it does not address the relevant antitrust question of whether the anticipated synergy is cognizable under the Horizontal Merger Guidelines. On the contrary, { [REDACTED] }
[REDACTED]
[REDACTED] } (CCFF ¶¶ 981-82). Accordingly, the synergy claim related to third-party spend is not verifiable and therefore not cognizable. (CCFF ¶ 983).

224. The transaction will also generate supply chain savings. (Mancini, Tr. 2775-76). The supply chain benefits will allow Tronox to reduce the price it pays because of the scale of purchases it will be making, which will allow the combined Tronox-Cristal to get a greater volume purchase discount than either company currently enjoys. (Mancini, Tr. 2775-76). For example, both Tronox and Cristal buy pet coke, and there are indications that having a global supply agreement for the volume from both companies would significantly reduce the cost per ton of pet coke. (Mancini, Tr. 2775-76).

Response to Proposed Finding No. 224

The Proposed Finding is vague in that it does not quantify the amount or specify the timing of any supply chain synergies. It is also incomplete in that it does not address the relevant antitrust question of whether the anticipated synergies are cognizable under the Horizontal Merger Guidelines. On the contrary, the claimed PET coke synergy relies on outdated and incomplete

information, as well as on unfounded assumptions. (CCFF ¶¶ 962-67). Moreover, many of the sources of other supply chain savings remain unidentified. (CCFF ¶ 968). Accordingly, the PET coke and other supply chain synergies are not verifiable and therefore not cognizable. (CCFF ¶¶ 967, 971).

225. The transaction will improve the debt-to-income ratio for the combined company and save financing costs because it will pair the new, increased revenue base of the combined company with the current debt of both. (Quinn, Tr. 2334-2336). “The estimated leverage for Tronox on a stand-alone basis was 4.4 million, 4.4 times EBITDA, and immediately with the deal, because [Tronox would purchase] with EBITDA and . . . stock,” leverage would immediately decrease. (Quinn, Tr. 2335-36; PX0010-175). Because of deleveraging, “[i]mmediately, when the transaction was done, that estimate [for earnings per share] on a pro forma basis would [increase by \$0.82] a share . . . a very positive improvement.” (Quinn, Tr. 2334-35).

Response to Proposed Finding No. 225

The Proposed Finding is misleading to the extent that it suggests that Tronox considered potential de-leveraging of the combined company’s debt to be a synergy. Indeed, the Tronox Board presentation it cites { [REDACTED] } (PX0010 at 171 (*in camera*)). Even if Respondents now claim de-leveraging as a synergy, The Proposed Finding is incomplete in that it fails to address the relevant antitrust question of whether it is cognizable under the Horizontal Merger Guidelines. In particular, the proposed finding fails to demonstrate that the potential de-leveraging is verifiable and merger-specific, and the extent to which it would benefit customers (specifically North American customers of chloride TiO₂) and not simply shareholders.

226. [REDACTED]

Response to Proposed Finding No. 226

The Proposed Finding is misleading and incomplete in that the customer testimony it cites was responding to questions that asked the witnesses to assume that the proposed acquisition would lead to lower costs and greater output globally (including in North America). (Young, Tr. 733-34 (*in camera*); Vanderpool, Tr. 247-48 (*in camera*)). Moreover, Mr. Young's testimony on this point should be given little-to-no weight because he lacks foundation as to whether Tronox will achieve any of the claimed synergies. { [REDACTED]

[REDACTED] }
 (Young, Tr. 739 (*in camera*)).

G. The FTC's Efficiencies Analysis Does Not Refute the Substantial Synergies to Be Realized from the Transaction.

a. Dr. Zmijewski Has No Expertise to Evaluate the Output-Enhancing Synergies.

227. Dr. Zmijewski is not an expert in the TiO₂ industry or TiO₂ manufacturing process. (Zmijewski, Tr. 1492-93). Dr. Zmijewski admitted that "[t]he extent of [his] knowledge regarding the operations in the TiO₂ industry . . . is limited to documents [he] reviewed in this case." (Zmijewski, Tr. 1496).

Response to Proposed Finding No. 227

The Proposed Finding is misleading because it is irrelevant to whether Dr. Zmijewski is qualified to assess the verifiability and merger specificity of the claimed synergies. His expertise in accounting, economics, and finance, as they relate to financial analysis and valuation, has qualified him to analyze merger efficiencies in several matters in the past, and to offer testimony in two antitrust trials. (Zmijewski, Tr. 1427-28). Courts in the past have recognized his expertise in performing such analysis. (Zmijewski, Tr. 1431). As he noted in his initial report, "It is widely accepted that accounting, economic, financial analysis, and valuation experts analyze alleged efficiencies in merger challenges to assist the trier of fact in assessing whether efficiencies are cognizable using the Merger Guidelines Efficiencies Criteria." (PX5001 at 012-13 (Zmijewski

Report) (*in camera*)). Notably, Respondents did not object to Complaint Counsel’s tender of Dr. Zmijewski as an expert in this matter. (Zmijewski, Tr. 1430).

228. Dr. Zmijewski has “no expertise or expert knowledge regarding the titanium dioxide manufacturing process.” (Zmijewski, Tr. 1493). Dr. Zmijewski is admittedly not an expert in the operations of the TiO₂ industry (Zmijewski, Tr. 1492), the technical operations at Tronox’s or Cristal’s pigment plants (Zmijewski, Tr. 1493), or the operation of any continuous process chemical manufacturing plants such as TiO₂ plants. (Zmijewski, Tr. 1493.)

Dr. Zmijewski is “not qualified to evaluate the similarities or differences between Tronox’s Hamilton plant and Cristal’s Yanbu plant” from a technical or operational perspective. (Zmijewski, Tr. 1493-94).²³

Response to Proposed Finding No. 228

The Proposed Finding is misleading because it is irrelevant to whether Dr. Zmijewski is qualified to assess the verifiability and merger specificity of the claimed synergies. His expertise in accounting, economics, and finance, as they relate to financial analysis and valuation, has qualified him to analyze merger efficiencies in several matters in the past, and to offer testimony in two antitrust trials. (Zmijewski, Tr. 1427-28). Courts in the past have recognized his expertise in performing such analysis. (Zmijewski, Tr. 1431). As he noted in his initial report, “It is widely accepted that accounting, economic, financial analysis, and valuation experts analyze alleged efficiencies in merger challenges to assist the trier of fact in assessing whether efficiencies are cognizable using the Merger Guidelines Efficiencies Criteria.” (PX5001 at 012-13 (Zmijewski Report)). Further, as Dr. Zmijewski testified, the process of verifying merger efficiencies is “not about assessing whether or not a number is the best forecast or the worst forecast. It’s about identifying foundation to support a number and whether that is—that support is reasonable.”

²³

(Zmijewski, Tr. 1466-67 (*in camera*)). Notably, Respondents did not object to Complaint Counsel’s tender of Dr. Zmijewski as an expert in this matter. (Zmijewski, Tr. 1430).

229. Dr. Zmijewski also admittedly has no expertise or background in “chemical engineering or chemistry or metallurgy or mining.” (Zmijewski, Tr. 1493). Dr. Zmijewski has no “technical or operational knowledge of how the Jazan facility works.” (Zmijewski, Tr. 1494). [REDACTED]

Response to Proposed Finding No. 229

The Proposed Finding is misleading because it is irrelevant to whether Dr. Zmijewski is qualified to assess the verifiability and merger specificity of the claimed synergies. His expertise in accounting, economics, and finance, as they relate to financial analysis and valuation, has qualified him to analyze merger efficiencies in several matters in the past, and to offer testimony in two antitrust trials. (Zmijewski, Tr. 1427-28). Courts in the past have recognized his expertise in performing such analysis. (Zmijewski, Tr. 1431). As he noted in his initial report, “It is widely accepted that accounting, economic, financial analysis, and valuation experts analyze alleged efficiencies in merger challenges to assist the trier of fact in assessing whether efficiencies are cognizable using the Merger Guidelines Efficiencies Criteria.” (PX5001 at 012-13 (Zmijewski Report) (*in camera*)). Further, as Dr. Zmijewski testified, the process of verifying merger efficiencies is “not about assessing whether or not a number is the best forecast or the worst forecast. It’s about identifying foundation to support a number and whether that is—that support is reasonable.” (Zmijewski, Tr. 1466-67 (*in camera*); *see also* PX7057 (Zmijewski, Dep. at 33) (*in camera*)). Finally, footnote 24 to the Proposed Finding is incorrect in that [REDACTED]

[REDACTED]

[REDACTED] } Rather, he testified, { [REDACTED]

[REDACTED] } (Zmijewski, Tr. 1584 (*in camera*)). In fact, Tronox would face a number of challenges that make the Jazan synergy uncertain and speculative. (CCFF ¶¶ 903-08). Notably, Respondents did not object to Complaint Counsel’s tender of Dr. Zmijewski as an expert in this matter. (Zmijewski, Tr. 1430).

230. Dr. Zmijewski is only holding himself out as an expert in “accounting, economics, and finance, as they relate to financial analysis and valuation.” (Zmijewski, Tr. 1492).

Response to Proposed Finding No. 230

The Proposed Finding is misleading because it suggests that Dr. Zmijewski’s expertise in accounting, economics, and finance, as they relate to financial analysis and valuation, are insufficient to assess the verifiability and merger specificity of the claimed synergies. In fact, his expertise has qualified him to analyze merger efficiencies in several matters in the past, and to offer testimony in two antitrust trials. (Zmijewski, Tr. 1427-28). Courts in the past have recognized his expertise in performing such analysis. (Zmijewski, Tr. 1431). As he noted in his initial report, “It is widely accepted that accounting, economic, financial analysis, and valuation experts analyze alleged efficiencies in merger challenges to assist the trier of fact in assessing whether efficiencies are cognizable using the Merger Guidelines Efficiencies Criteria.” (PX5001 at 012-13 (Zmijewski Report) (*in camera*)). Notably, Respondents did not object to Complaint Counsel’s tender of Dr. Zmijewski as an expert in this matter. (Zmijewski, Tr. 1430).

b. Dr. Zmijewski Does Not Offer the Opinion that the Transaction Synergies Will Not Occur.

231. Dr. Zmijewski, the FTC’s expert in finance and accounting, does not offer the opinion that the synergies will not occur. (Zmijewski, Tr. 1519). Specifically:

- f. Dr. Zmijewski is not offering the opinion that there would be no increase in the output of TiO₂ from the post-merger firm (Zmijewski, Tr. 1519);

- g. Dr. Zmijewski is not offering the opinion that Tronox would not be able to expand its feedstock supply (Zmijewski, Tr. 1519); and
- h. Dr. Zmijewski is not offering the opinion that there would be no cost-saving efficiencies (Zmijewski, Tr. 1519).

Response to Proposed Finding No. 231

The Proposed Finding is misleading and incomplete because it fails to address the key question under the Horizontal Merger Guidelines of whether the claimed efficiencies are cognizable (i.e., verifiable, merger-specific, and not arising from competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines)). Based on those criteria, Dr. Zmijewski task is not to apply his own judgment of what synergies Respondents should be able to achieve, but to assess whether their claimed synergies are *verifiable*, that is, whether Respondents have provided sufficient “data, documents, analysis, calculations, other type of information, that can be used to substantiate the claimed efficiencies.” (Zmijewski, Tr. 1431). As Dr. Zmijewski testified, “I don’t see a number as accurate or inaccurate. The verification process, that’s not the purpose. The purpose is can you identify information that is foundational for a particular assumption so that the Government has some level of confidence, whatever is required, that the assumption is reasonable based on what the Court determines in this particular case. . . . I don’t make decisions if it’s right or wrong. It’s all about identifying foundation for verification purposes.” (Zmijewski, Tr. 1521-22). Accordingly, upon reviewing and analyzing Respondents’ synergy claims under the Horizontal Merger Guidelines, Dr. Zmijewski ultimately found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had not demonstrated that the claims are merger specific. (CCFF ¶¶ 830-32).

232. Dr. Zmijewski also does not “have an opinion one way or the other regarding whether KPMG’s findings in its due diligence assessment [of the transaction synergies] are correct.” (Zmijewski, Tr. 1552). Dr. Zmijewski “ha[sn’t] evaluated whether or not [KPMG’s] statements are correct.” (Zmijewski, Tr. 1552).

Response to Proposed Finding No. 232

The Proposed Finding is misleading and incomplete because it fails to address whether the claimed synergies are verifiable as required by the Horizontal Merger Guidelines. (PX9085 at 033 (Horizontal Merger Guidelines)). Based on those criteria, Dr. Zmijewski task is not to apply his own judgment of what synergies Respondents should be able to achieve, but to assess whether their claimed synergies are *verifiable*, that is, whether Respondents have provided sufficient “data, documents, analysis, calculations, other type of information, that can be used to substantiate the claimed efficiencies.” (Zmijewski, Tr. 1431). Again, as Dr. Zmijewski testified, “I don’t see a number as accurate or inaccurate. The verification process, that’s not the purpose. The purpose is can you identify information that is foundational for a particular assumption so that the Government has some level of confidence, whatever is required, that the assumption is reasonable based on what the Court determines in this particular case. . . . I don’t make decisions if it’s right or wrong. It’s all about identifying foundation for verification purposes.” (Zmijewski, Tr. 1521-22). Accordingly, upon reviewing and analyzing Respondents’ synergy claims under the Horizontal Merger Guidelines, Dr. Zmijewski ultimately found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had not demonstrated that the claims are merger specific. (CCFF ¶¶ 830-32).

233. When Dr. Zmijewski says a particular efficiency is “not verified,” he is *not* saying “that the efficiency will never come to pass.” (Zmijewski, Tr. 1505-06). [REDACTED]

Response to Proposed Finding No. 233

The Proposed Finding is misleading to the extent it implies that the relevant standard for evaluating a claimed synergy is whether it “is going to happen or not,” or will ever “come to pass.” As the Horizontal Merger Guidelines make clear, only cognizable efficiencies can be weighed

against likely anticompetitive effects, meaning “merger-specific efficiencies that have been verified and do not arise from anticompetitive reductions in output or service.” (PX9085 at 033 (Horizontal Merger Guidelines)). Respondents’ claims in many cases lacked foundation or relied on unfounded assumptions or unverifiable business judgment; in addition there appear to be practical alternatives other than the proposed acquisition for Respondents to achieve a number of the claimed synergies. (CCFF ¶¶ 842-1017). Accordingly, upon reviewing and analyzing Respondents’ synergy claims under the Horizontal Merger Guidelines, Dr. Zmijewski ultimately found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had not demonstrated that the claims are merger specific. (CCFF ¶¶ 830-32).

234. All Dr. Zmijewski means when he says a particular synergy is not “verifiable” is that in all the information he reviewed, including the expert reports, he “ha[sn’t] seen enough substantiation or a suitable methodology in the records available to [him] to say that the efficiency is verified according to [his] standards.” (Zmijewski, Tr. 1505-06). Dr. Zmijewski “do[esn’t] say the efficiencies are correct or incorrect. I think I said, hopefully clearly on my direct testimony, I don’t see a number as accurate or inaccurate. The verification process, that’s not the purpose. The purpose is can you identify information that is foundational for a particular assumption so that the Government has some level of confidence, whatever is required, that that assumption is reasonable based on what the Court determines in this particular case.” (Zmijewski, Tr. 1521-22).

Response to Proposed Finding No. 234

Complaint Counsel has no specific response.

235. As Dr. Zmijewski succinctly put it: “I don’t say the efficiencies are correct or incorrect.” (Zmijewski, Tr. 1521-22).

Response to Proposed Finding No. 235

The Proposed Finding is misleading to the extent it implies that the relevant standard for evaluating a claimed synergy is whether it “correct or incorrect.” As the Horizontal Merger Guidelines make clear, only cognizable efficiencies can be weighed against likely anticompetitive effects, meaning “merger-specific efficiencies that have been verified and do not arise from

anticompetitive reductions in output or service.” (PX9085 at 033 (Horizontal Merger Guidelines)). Respondents’ claims in many cases lacked foundation or relied on unfounded assumptions or unverifiable business judgment; in addition there appear to be practical alternatives other than the proposed acquisition for Respondents to achieve a number of the claimed synergies. (CCFF ¶¶ 842-1017). Accordingly, upon reviewing and analyzing Respondents’ synergy claims under the Horizontal Merger Guidelines, Dr. Zmijewski ultimately found that Respondents had not provided sufficient information for the claimed synergies to be independently verified and had not demonstrated that the claims are merger specific. (CCFF ¶¶ 830-32).

c. Dr. Zmijewski Does Not Offer Any Alternative Estimate or Calculation of the Synergies.

236. Dr. Zmijewski is not offering “any alternative calculation of efficiencies beyond what the Respondents have put forward.” (Zmijewski, Tr. 1519). [REDACTED]
 Dr. Zmijewski also did not offer a “haircut” to the synergies. (Zmijewski, Tr. 1520). [REDACTED] Dr. Zmijewski has “never calculated [his] own efficiencies.” (Zmijewski, Tr. 1519-20).

Response to Proposed Finding No. 236

The Proposed Finding is misleading in that it suggests that it is incumbent upon Dr. Zmijewski to offer calculations of Respondents’ synergies. As the Horizontal Merger Guidelines make clear, [I]t is incumbent upon the merging firms to substantiate efficiency claims” (PX9085 at 033 (Horizontal Merger Guidelines); *see also* Zmijewski, Tr. 1544 (*in camera*)). Consistent with this, Dr. Zmijewski’s “understanding of my assignments have always been, in every one of the cases, was to review the evidence put forward by the Respondents on their efficiency claims and assess whether or not they’re verifiable or merger-specific and provide evidence to the Court on that—on those dimensions.” (Zmijewski, Tr. 1519).

237. Dr. Zmijewski did not even review every document that he listed as having been reviewed in his expert report. (Zmijewski, Tr. 1502).

Response to Proposed Finding No. 237

The Proposed Finding is misleading and incomplete in that it fails to account for Dr. Zmijewski's process of gathering and reviewing information for his analysis. As Dr. Zmijewski explained, "I have a group of people at Charles River Associates who work with me on these matters, and they work on all these matters with me. So it's a group of people working under my direction or supervision." (Zmijewski, Tr. 1502). He further explained, "[t]he group looked at those documents. They read all those documents," and "[w]hat happens is we sit down, we discuss the documents that we received, and we talk about what we're looking for, and they will tell me here's a document that has that information in it, you should read this, or relook at this." (Zmijewski, Tr. 1503-04).

H. The Parties' Estimates of the Transaction Synergies Were Subject to Extensive Third-Party and Company Review and Verification.

238. Not only are the synergy estimates for the transaction based on extensive due diligence by both Tronox and Cristal, but they have also been subject to extensive third-party review and due diligence by KPMG, a third-party consultant. (Mancini, Tr. 2801).

Response to Proposed Finding No. 238

The Proposed Finding is misleading in that it wrongly suggests that the due diligence in connection with the proposed acquisition was an antitrust analysis of cognizable efficiencies as defined by the Horizontal Merger Guidelines. (CCFF ¶ 841). On the contrary, as Dr. Zmijewski explained, { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (Zmijewski, Tr. 1439 (*in camera*)). In fact, { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX0006 at 003 (KPMG Report) (*in camera*); Zmijewski, Tr. 1586-88 (*in camera*)). Dr. Zmijewski further explained at trial that { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (Zmijewski, Tr. 1548-49 (*in camera*)). Moreover, in applying the criteria set forth by the Horizontal Merger Guidelines, { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 949-93).

{ [REDACTED]

[REDACTED]

[REDACTED] } (PX0006 at 005 (KPMG Report) (*in camera*); CCFF ¶¶ 936, 955, 959, 969).

a. KPMG, a Third-Party Consultant, Pressure-Tested the Company’s Synergies Estimates.

239. KPMG was hired by Tronox as a third-party consultant in this case to evaluate the transaction and the synergies to be realized. (Mancini, Tr. 2801; Zmijewski, Tr. 1528). [REDACTED]

[REDACTED]

Response to Proposed Finding No. 239

The Proposed Finding is misleading and incomplete in that the “evaluat[ion]” and “assessment” that KPMG performed for Tronox was not evaluating cognizability under the Horizontal Merger Guidelines. (CCFF ¶ 841). On the contrary, as Dr. Zmijewski explained,

{ [REDACTED]

[REDACTED]

[REDACTED] }

(Zmijewski, Tr. 1439 *in camera*). He further testified, { [REDACTED] }
[REDACTED]
[REDACTED] } (Zmijewski, Tr. 1548-49 *in camera*). In applying
the criteria set forth by the Horizontal Merger Guidelines, { [REDACTED] }
[REDACTED]
[REDACTED] } (CCFF ¶¶ 949-93).
{ [REDACTED] }
[REDACTED]
[REDACTED] } (PX0006 at 005 (KPMG Report) *in camera*); CCFF ¶¶ 936, 955, 959, 969).

240. As the FTC acknowledged, companies often hire third-party accountants, consultants, and financial advisors like KPMG to assist in the due diligence process. (Zmijewski, Tr. 1521). KPMG is a “very reputable firm.” (Quinn, Tr. 2339).

Response to Proposed Finding No. 240

The Proposed Finding is misleading in that merger due diligence, such as the diligence KPMG performed for Tronox, is not about evaluating cognizability under the Horizontal Merger Guidelines. (CCFF ¶ 841). On the contrary, as Dr. Zmijewski explained, { [REDACTED] }
[REDACTED]
[REDACTED]
[REDACTED] }
(Zmijewski, Tr. 1439 *in camera*). He further testified, { [REDACTED] }
[REDACTED]
[REDACTED] } (Zmijewski, Tr. 1548-49 *in camera*).

241. “The company hired KPMG to . . . perform a detailed review of this assessment and to pressure-check and challenge the assumptions.” (Quinn, Tr. 2338-39). It “was a very important part of (the synergy analysis), to get that third-party, independent verification.” (Quinn, Tr. 2339). Tronox “brought in . . . real expertise from outside to make sure that” the synergy

analysis is “done correctly.” (Quinn, Tr. 2339). KPMG’s synergy assessment was relied upon and presented to banks in order to obtain financing for the transaction. (Quinn, Tr. 2338).

Response to Proposed Finding No. 241

The Proposed Finding is misleading in that the due diligence KPMG performed for Tronox was not evaluating cognizability under the Horizontal Merger Guidelines. (CCFF ¶ 841). On the

contrary, as Dr. Zmijewski explained, { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (Zmijewski, Tr. 1439 (*in camera*)). He further

testified, { [REDACTED]

[REDACTED] }

(Zmijewski, Tr. 1548-49 (*in camera*)). Moreover, { [REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (Zmijewski, Tr. 1573-74 (*in camera*)). In applying the criteria set forth by

the Horizontal Merger Guidelines, { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 949-93). { [REDACTED]

[REDACTED]

[REDACTED] } (PX0006 at

005 (KPMG Report) (*in camera*); CCFF ¶¶ 936, 955, 959, 969).

242. KPMG “assess[ed]” and “pressure-test[ed]” the synergies. (Mancini, Tr. 2801-02).

Response to Proposed Finding No. 242

The Proposed Finding is misleading in that any “assess[ing] or “pressure test[ing]” that KPMG performed for Tronox was not evaluating cognizability under the Horizontal Merger Guidelines. (CCFF ¶ 841). On the contrary, as Dr. Zmijewski explained, { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] }

(Zmijewski, Tr. 1439 (*in camera*)). He further testified, { [REDACTED]

[REDACTED]

[REDACTED] } (Zmijewski, Tr. 1548-49 (*in camera*)). In applying

the criteria set forth by the Horizontal Merger Guidelines, { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 949-93).

{ [REDACTED]

[REDACTED]

[REDACTED] } (PX0006 at 005 (KPMG Report) (*in camera*); CCFF ¶¶ 936, 955, 959, 969).

243. KPMG validated the synergies that Tronox had publicly communicated. (Mancini, Tr. 2804).

Response to Proposed Finding No. 243

The Proposed Finding is misleading and contrary to the language in the KPMG Report itself. Specifically, { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX0006 at 003 (KPMG Report) (emphasis added) (*in camera*); *see also* Zmijewski,

Tr. 1586-88 (*in camera*)). Dr. Zmijewski further explained at trial that { [REDACTED] }
[REDACTED]
[REDACTED] } (Zmijewski, Tr. 1548-49 (*in camera*)). In applying the criteria set forth by the Horizontal Merger Guidelines, { [REDACTED] }
[REDACTED]
[REDACTED]
[REDACTED] } (CCFF ¶¶ 949-93). { [REDACTED] }
[REDACTED]
[REDACTED] } (PX0006 at 005 (KPMG Report) (*in camera*); CCFF ¶¶ 936, 955, 959, 969).

244. KPMG’s due diligence analysis was conducted by synergy and assessment and validation team to look at Tronox’s estimates. (Mancini, Tr. 2802). The KPMG team included both operating and financial personnel. (Mancini, Tr. 2802). [REDACTED]
[REDACTED]

Response to Proposed Finding No. 244

The Proposed Finding is misleading in that the KPMG team conducting due diligence for Tronox was not evaluating cognizability under the Horizontal Merger Guidelines. (CCFF ¶ 841). On the contrary, as Dr. Zmijewski explained, { [REDACTED] }
[REDACTED]
[REDACTED]
[REDACTED] } (Zmijewski, Tr. 1439 (*in camera*)). He further testified, { [REDACTED] }
[REDACTED] }
(Zmijewski, Tr. 1548-49 (*in camera*)). In applying the criteria set forth by the Horizontal Merger

Guidelines, { [REDACTED] }
[REDACTED]
[REDACTED] } (CCFF ¶¶ 949-93). { [REDACTED] }
[REDACTED]
[REDACTED] } (PX0006 at 005 (KPMG
Report) (*in camera*); CCFF ¶¶ 936, 955, 959, 969).

245. [REDACTED]
[REDACTED]

Response to Proposed Finding No. 245

The Proposed Finding is misleading in that the “standard analysis” that KPMG performed was not an antitrust analysis of efficiencies consistent with the Horizontal Merger Guidelines. (CCFF ¶ 841). On the contrary, as Dr. Zmijewski explained, [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (Zmijewski, Tr. 1439 (*in camera*)). He further testified, { [REDACTED] }
[REDACTED]
[REDACTED] } (Zmijewski, Tr. 1548-49 (*in camera*)). In applying the criteria set forth by the Horizontal Merger Guidelines, { [REDACTED] }
[REDACTED]
[REDACTED] } (CCFF ¶¶ 949-93). { [REDACTED] }
[REDACTED]

[REDACTED]”}

(PX0006 at 005 (KPMG Report) *in camera*); CCF ¶¶ 936, 955, 959, 969).

246. The KPMG team was clean-team certified, and were given access to the entire data room, including even data that company personnel at Tronox and Cristal could not access. (Mancini, Tr. 2802-04). [REDACTED]

[REDACTED] The KPMG team was “able to access all the information that was made available to Tronox and more.” (Mancini, Tr. 2802-04). KPMG had information available to them that was not available to both parties, i.e., Cristal and Tronox. (Mancini, Tr. 2802-04).

Response to Proposed Finding No. 246

The Proposed Finding is misleading in that KPMG was not using data to perform an antitrust analysis of efficiencies consistent with the Horizontal Merger Guidelines. (CCFF ¶ 841).

On the contrary, as Dr. Zmijewski explained, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (Zmijewski, Tr. 1439 *in camera*)). He further testified, { [REDACTED]

[REDACTED] }

(Zmijewski, Tr. 1548-49 *in camera*)). In applying the criteria set forth by the Horizontal Merger Guidelines, { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 949-93). { [REDACTED]

[REDACTED]

[REDACTED] } (PX0006 at 005 (KPMG Report) *in camera*); CCF ¶¶ 936, 955, 959, 969).

247. [REDACTED]

Response to Proposed Finding No. 247

The Proposed Finding is misleading and incomplete in that the KPMG Report does not reflect an antitrust analysis of efficiencies consistent with the Horizontal Merger Guidelines.

(CCFF ¶ 841). In fact, [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (PX0006 at 003 (KPMG Report) (*in camera*); Zmijewski, Tr. 1586-88 (*in camera*)).

Dr. Zmijewski further explained at trial that [REDACTED]
[REDACTED]
[REDACTED] } (Zmijewski, Tr. 1548-49 (*in camera*)). In

applying the criteria set forth by the Horizontal Merger Guidelines, [REDACTED]
[REDACTED]
[REDACTED] } (CCFF ¶¶
949-993). [REDACTED]
[REDACTED]

[REDACTED] } (PX0006 at 005 (KPMG Report) (*in camera*); CCFF ¶¶ 936, 955, 959, 969).

248. KPMG “put their stamp of approval” on Tronox’s synergies. (Mancini, Tr. 2801-2). KPMG “had a strong level of confidence that . . . Tronox could deliver these estimated synergies.” (Mancini, Tr. 2801-02). KPMG’s report, which “demonstrated they had assessed and validated the synergies that we had publicly communicated” was “provide[d] to the lenders.” (Mancini, Tr. 2804).

Response to Proposed Finding No. 248

The Proposed Finding is vague as to the meaning of the terms “confidence” and “stamp of approval” and misleading and incomplete in that KPMG’s confidence does not address whether the claimed synergies are independently verifiable and merger specific under the Horizontal Merger Guidelines. Complaint Counsel’s expert Dr. Zmijewski analyzed Respondents’ claimed synergies under the framework of the Horizontal Merger Guidelines and concluded that Respondents have failed to demonstrate that the claimed synergies are verifiable or merger specific. (CCFF ¶¶ 830-32). In addition, The Proposed Finding is misleading and contrary to the language in the KPMG Report itself. Specifically, { [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] } (PX0006 at 003 (KPMG Report) (*in camera*); Zmijewski, Tr. 1586-88 (*in camera*)). Dr. Zmijewski further explained at trial that { [REDACTED] [REDACTED] [REDACTED] } (Zmijewski, Tr. 1548-49 (*in camera*)). In applying the criteria set forth by the Horizontal Merger Guidelines, { [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] } (CCFF ¶¶ 949-93). { [REDACTED] [REDACTED] [REDACTED] } (PX0006 at 005 (KPMG Report) (*in camera*); CCFF ¶¶ 936, 955, 959, 969).

b. Tronox Has Conducted Extensive Due Diligence to Support Its Synergies Estimates.

249. In addition to third-party due diligence review by KPMG, Tronox and Cristal worked cooperatively to develop a “detailed synergy analysis” for the transaction synergies. (Quinn, Tr. 2337; PX0010-175).

Response to Proposed Finding No. 249

The Proposed Finding is misleading and incomplete in that it fails to explain how Tronox’s “detailed synergy analysis” demonstrates that the claimed synergies are verifiable or merger specific, as required by the Horizontal Merger Guidelines. (PX9085 at 032-34 (Horizontal Merger Guidelines, § 10). Complaint Counsel’s expert Dr. Zmijewski reviewed and analyzed Respondents’ “detailed synergy analysis” under the framework of the Horizontal Merger Guidelines and concluded that Respondents “have not provided sufficient analysis, foundation, and/or documentation necessary to verify the Alleged Efficiencies,” and that “some of the Alleged Efficiencies cannot be verified because the underpinning assumptions appear to be based on management’s business judgment; other Alleged Efficiencies cannot be verified because of a lack of sufficient factual foundation; other Alleged Efficiencies cannot be verified because of a lack of analytical foundation; and other Alleged Efficiencies cannot be verified because of a combination of the above shortcomings.” (CCFF ¶¶ 830-32). In addition, Dr. Zmijewski found that Respondents “fail to demonstrate that the Alleged Efficiencies for the Proposed Acquisition are merger-specific.” (CCFF ¶¶ 830-32).

250. The synergy analysis was “on-the-ground work that happened with a team consisting of Tronox people and Cristal people to go out and really” take a look at the synergies. “[T]here were boots on the ground . . . by experienced operating people, to take a look at what” the synergies were. (Quinn, Tr. 2337-38). The synergies analysis wasn’t “done by a bunch of investment bankers sitting around in their offices in New York.” (Quinn, Tr. 2337-38).

Response to Proposed Finding No. 250

The Proposed Finding is vague as to the meaning of the terms “on-the-ground work,” “boots on the ground” and “really tak[ing] a look,” and how they relate to the standards for

verifiability and merger specificity in the Horizontal Merger Guidelines. (PX9085 at 032-34 (Horizontal Merger Guidelines, § 10). Complaint Counsel’s expert Dr. Zmijewski analyzed Respondents’ claimed synergies under the framework of the Horizontal Merger Guidelines and concluded that Respondents have failed to demonstrate that the claimed synergies are verifiable or merger specific. (CCFF ¶¶ 830-32).

251. Tronox “formed a significant . . . project management office . . . and has a very formal process for identifying each of these synergies, assigning accountability for it, tracking it . . . and measuring it.” (Quinn, Tr. 2339). “The Tronox diligence team visited each of the Cristal facilities around the world.” (Quinn, Tr. 2354-55).

Response to Proposed Finding No. 251

The Proposed Finding is misleading and incomplete in that it fails to explain how Tronox’s process or diligence visits impact any analysis of the verifiability and merger specificity of the claimed synergies as required by the Horizontal Merger Guidelines. (PX9085 at 032-34 (Horizontal Merger Guidelines, § 10). Complaint Counsel’s expert Dr. Zmijewski analyzed Respondents’ claimed synergies under the framework of the Horizontal Merger Guidelines and concluded that Respondents have failed to demonstrate that the claimed synergies are verifiable or merger specific. (CCFF ¶¶ 830-32).

252. 

Response to Proposed Finding No. 252

The Proposed Finding is misleading and incomplete in that it fails to explain specifically how the referenced spreadsheet relates to any analysis of the verifiability or merger specificity of the claimed synergies as required by the Horizontal Merger Guidelines. (PX9085 at 032-34

(Horizontal Merger Guidelines, § 10). Indeed, the spreadsheet underlying PX0008 was among the key documents Dr. Zmijewski relied on in his analysis of the claimed synergies. (CCFF ¶ 828).

As with the KPMG Report, however, Dr. Zmijewski found that { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 954, 958, 968, 973, 976, 979).

253. [REDACTED]

[REDACTED]

Response to Proposed Finding No. 253

The Proposed Finding is vague and confusing in that it is unclear what precisely Respondents' claims are for the purposes of performing efficiencies analysis in this matter. During the investigation of the proposed acquisition, Tronox identified its Synergies White Paper as setting forth their efficiencies claims in this matter. (CCFF ¶ 824). During this litigation, Tronox again pointed to the Synergies White Paper, noting that its efficiencies analysis had { [REDACTED]

[REDACTED] } (CCFF ¶ 825). Based on the proposed finding, it is unclear what Respondents' claims are. In addition, the Proposed Finding is misleading and incomplete because it fails to explain how any "subsequent efforts" or "due diligence" address the key question under the Horizontal Merger Guidelines of whether the claimed efficiencies are cognizable (i.e., verifiable, merger-specific, and not arising from competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines)).

254. [REDACTED]

[REDACTED]

Response to Proposed Finding No. 254

The Proposed Finding is vague as to the meaning or significance of the term “confidence,” and incomplete in that it fails to explain specifically how Tronox’s confidence impacts whether those estimates are independently verifiable and merger specific as required by the Horizontal Merger Guidelines. (PX9085 at 032-34 (Horizontal Merger Guidelines, § 10). Complaint Counsel’s expert Dr. Zmijewski analyzed Respondents’ claimed synergies under the framework of the Horizontal Merger Guidelines and concluded that Respondents have failed to demonstrate that the claimed synergies are verifiable or merger specific. (CCFF ¶¶ 830-32).

c. The Extensive Company and Third-Party Due Diligence on the Transaction Synergies Satisfies the Standard for Verification Under the Merger Guidelines.

255. Dr. Zmijewski admitted that the Merger Guidelines and existing case law “do not prescribe specific standards, methods, or tests that should be used to verify efficiency claims.” (Zmijewski, Tr. 1489).

Response to Proposed Finding No. 255

The Proposed Finding is misleading and incomplete in that it fails to address the Commentary on the Horizontal Merger Guidelines, which “provide[] guidance on the documentation that the DOJ and FTC look for to substantiate efficiency claims, and the process they use to verify those claims.” (PX5001 at 013 (Zmijewski Initial Report)). For example, the Commentary notes that “[t]he verification process usually includes, among other things, an assessment of the parties’ analytical methods, including the accuracy of their data collection and measurement, an evaluation of the reasonableness of assumptions in the analysis, and scrutiny into how well the parties’ conclusions stand up to modifications in any assumptions (i.e., the ‘robustness’ of the parties’ analysis).” (PX9120 at 056 (Commentary on the Horizontal Merger Guidelines); *see also* PX5001 at 014 (Zmijewski Initial Report)). Based on the criteria set forth in the Horizontal Merger Guidelines and the guidance provided by the Commentary, Dr. Zmijewski developed a methodology that has provided the basis for his testimony in multiple cases in the

past, to assess verifiability of claimed efficiencies. (Zmijewski, Tr. 1430-31; *see also* PX5001 at 015 (Zmijewski Initial Report)).

256. Dr. Zmijewski agreed that under the Merger Guidelines, federal agencies evaluating mergers and acquisitions in the antitrust context “give careful consideration to the views of individuals whose responsibilities, expertise, and experience relating to the issues in question provide particular indicia of reliability.” (Zmijewski, Tr. 1492).

Response to Proposed Finding No. 256

The Proposed Finding is misleading and incomplete in that giving due consideration to the views of those individuals does not alter the requirement that claimed synergies be independently verifiable. As Dr. Zmijewski testified, the “verification process doesn’t depend on the views of individuals, it’s based on facts and analyses.” (PX7057 (Zmijewski, Dep. at 064) (*in camera*)). Moreover, as Dr. Zmijewski testified, management business judgment, on its own and unsupported by “coherent documents, analysis, that provide foundation for the judgment” is insufficient for verification purposes. (Zmijewski, Tr. 1464-65 (*in camera*); CCF ¶ 937). “Verification of business judgment requires a factual foundation to support the numbers provided by business executives.” (Zmijewski, Tr. 1464-65 (*in camera*); CCF ¶ 937).

257. [REDACTED]

Response to Proposed Finding No. 257

The Court should disregard the proposed finding because the assertion that there are [REDACTED] is a factual proposition that should be established by a fact witness or documents, not through expert testimony. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). Moreover, The Proposed Finding is misleading and incomplete in that the presence of [REDACTED] does not by itself make the claimed synergies independently verifiable as required by the

Horizontal Merger Guidelines. As Dr. Zmijewski testified, “My verification process doesn’t depend on the views of individuals, it’s based on facts and analyses.” (PX7057 (Zmijewski, Dep. at 064) (*in camera*)). Moreover, as Dr. Zmijewski testified, management business judgment, on its own and unsupported by “coherent documents, analysis, that provide foundation for the judgment” is insufficient for verification purposes. (Zmijewski, Tr. 1464-65 (*in camera*); CCF ¶ 937). “Verification of business judgment requires a factual foundation to support the numbers provided by business executives.” (Zmijewski, Tr. 1464-65 (*in camera*); CCF ¶ 937).

258. Dr. Zmijewski acknowledged that the Respondents “clearly have more information than I do and more data than even is available to the Court” regarding the calculation of transaction synergies. (Zmijewski, Tr. 1519-20).

Response to Proposed Finding No. 258

The Court should disregard the proposed finding because the assertion that Tronox has more information than is available to the Court is a factual proposition that should be established by a fact witness or documents, not through expert testimony. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794). Moreover, The Proposed Finding is misleading and incomplete in that it fails to acknowledge that, it is precisely because Respondents have more information than is available to the court, that it is incumbent upon them to substantiate their efficiencies claims and to demonstrate that those claimed efficiencies are cognizable as required by the Guidelines (i.e., that they are verifiable, merger-specific, and not arising from competitive harm). (PX9085 at 033 (Horizontal Merger Guidelines); *see also* Zmijewski, Tr. 1544 (*in camera*)). Consistent with this, Dr. Zmijewski’s “understanding of my assignments have always been, in every one of the cases, was to review the evidence put forward by the Respondents on their efficiency claims and assess whether or not they’re verifiable or merger-specific and provide evidence to the Court on that—on those dimensions.” (Zmijewski, Tr. 1519).

259. Dr. Zmijewski agreed that under the Merger Guidelines, “business records about output and level of activity are appropriate factual bases for determining the verifiability of synergies.” (Zmijewski, Tr. 1491). Dr. Zmijewski also agreed that “business records about capacity utilization, labor efficiency, and utilization rates are appropriate factual bases for determining verifiability of synergies.” (Zmijewski, Tr. 1491-92).

Response to Proposed Finding No. 259

The Proposed Finding is misleading and vague in that it refers to generic categories of evidence in the abstract that may provide appropriate factual bases for determining verifiability but fails to identify any particular evidence or explain how such categories are relevant to this particular matter. In addition, it does not logically follow that such types of evidence are sufficient to determine that any particular claimed synergy is verifiable under the Guidelines. On the contrary, business records of any kind are subject to the same standards of verifiability. In this matter, Dr. Zmijewski considered a wide range of evidence, including numerous ordinary-course internal documents from both Tronox and Cristal, and based on his review he determined that Respondents have failed to demonstrate that their claimed efficiencies are verifiable or merger specific. (CCFF ¶¶ 830-32).

260. Dr. Zmijewski has not found and does not offer the opinion that any of the transaction efficiencies arise from “anticompetitive reductions in output or service.” (Zmijewski, Tr. 1488).

Response to Proposed Finding No. 260

Complaint Counsel has no specific response.

I. Tronox Has Successfully Achieved—and Exceeded Its Estimates for—Synergies from Prior Acquisitions Involving Vertical Integration.

261. Tronox has experience achieving many of the same types of synergies as are expected from the Cristal transaction (supply chain and logistics, value in use of feedstock, and SG&A), and has successfully done so in the past. (Mancini, Tr. 2746-47).

Response to Proposed Finding No. 261

The Proposed Finding is misleading and vague in that it fails to specify its “experience” or precisely which synergies from the Cristal transaction it refers to. It is also incomplete in that it fails to explain how any such synergies are similar to the types Tronox has allegedly experienced in the past. It is also incomplete in that it fails to acknowledge that Tronox’s experience also includes falling short of its estimated synergies, namely in its acquisition of FMC Alkali. (Mancini, Tr. 2907-09). Finally, it fails to address the question of whether any past synergies were cognizable under the Horizontal Merger Guidelines. As Dr. Zmijewski noted, “In order for prior experience to serve as the foundation for evaluating merger efficiency claims at issue, the alleged cost savings in the prior merger must in fact be verifiable, merger specific efficiencies, and the two mergers must be sufficiently similar to apply the historical experience. (PX5003 at 021-22 (Zmijewski Rebuttal Report to Imburgia and Stern)). He also testified, “Somebody would go through and actually make sure that those efficiencies that fit into the category are—and for verification are appropriate efficiencies that would fit into the cognizable category. So you’d have to check to make sure that the efficiencies fit into the bucket that is relevant for offsetting anticompetitive effects.” (Zmijewski, Tr. 1579 (*in camera*)). Respondents here do not even cite any evidence or expert testimony that makes this demonstration.

262. 

Response to Proposed Finding No. 262

The Court should disregard the proposed finding because the assertions about Tronox’s announcements and the nature of Exxaro’s business are factual propositions that should be established by a fact witness or documents, not through expert testimony. The Proposed Finding

is misleading and incomplete in that it fails to explain the relevance to the proposed acquisition of any announced synergies related to the Exxaro transaction. In addition, it fails to address the question of whether any synergies from the Exxaro transaction were cognizable under the Horizontal Merger Guidelines. As Dr. Zmijewski noted, “In order for prior experience to serve as the foundation for evaluating merger efficiency claims at issue, the alleged cost savings in the prior merger must in fact be verifiable, merger specific efficiencies, and the two mergers must be sufficiently similar to apply the historical experience. (PX5003 at 021-22 (Zmijewski Rebuttal Report to Imburgia and Stern) (*in camera*)). He also testified, “Somebody would go through and actually make sure that those efficiencies that fit into the category are—and for verification are appropriate efficiencies that would fit into the cognizable category. So you’d have to check to make sure that the efficiencies fit into the bucket that is relevant for offsetting anticompetitive effects.” (Zmijewski, Tr. 1579 (*in camera*)).

263. [REDACTED]

[REDACTED] Tronox not only successfully realized the anticipated synergies in the Exxaro transaction, but it “overdelivered on the synergy estimates.” (Mancini, Tr. 2747-48).

Response to Proposed Finding No. 263

The Court should disregard the proposed finding to the extent it cites Dr. Zmijewski, because the assertions about Tronox’s announcements relating to the Exxaro transactions are factual propositions that should be established by a fact witness or documents, not through expert testimony. In addition, Mr. Mancini’s testimony should be given little weight because he was not involved in developing the synergy estimates for the Exxaro transaction. (Mancini, Tr. 2822). The Proposed Finding is also misleading and incorrect. [REDACTED]

[REDACTED] } (Zmijewski, Tr. 1578-79 (*in camera*)). In addition, The Proposed Finding is misleading and incomplete in that it fails to address whether any synergies from the Exxaro transaction are similar to the anticipated synergies in the proposed transaction. In addition, The Proposed Finding is incomplete in that it fails to address the question of whether any announced synergies from the Exxaro transaction were cognizable under the Horizontal Merger Guidelines. As Dr. Zmijewski noted, “In order for prior experience to serve as the foundation for evaluating merger efficiency claims at issue, the alleged cost savings in the prior merger must in fact be verifiable, merger specific efficiencies, and the two mergers must be sufficiently similar to apply the historical experience. (PX5003 at 021-22 (Zmijewski Rebuttal Report to Imburgia and Stern)). He also testified, “Somebody would go through and actually make sure that those efficiencies that fit into the category are—and for verification are appropriate efficiencies that would fit into the cognizable category. So you’d have to check to make sure that the efficiencies fit into the bucket that is relevant for offsetting anticompetitive effects.” (Zmijewski, Tr. 1579 (*in camera*)).

264. Indeed, not only did Tronox overdeliver on the synergies, it did so on an earlier timeline than anticipated. (Mancini, Tr. 2747-48). Tronox estimated approximately \$30 million in synergies “by the end of year two,” but “already realized 32 million of synergies by the end of year one.” (Mancini, Tr. 2747-48). And “by the end of year two, we were at 40 million of synergies.” (Mancini, Tr. 2747-48).

Response to Proposed Finding No. 264

The Proposed Finding is misleading and incomplete in that it fails to address whether any synergies from the Exxaro transaction are similar to the anticipated synergies in the proposed transaction. In addition, Mr. Mancini’s testimony should be given little weight because he was not involved in developing the synergy estimates for the Exxaro transaction. (Mancini, Tr. 2822). The Proposed Finding is also incomplete in that it fails to address the question of whether any

announced synergies from the Exxaro transaction were cognizable under the Horizontal Merger Guidelines. As Dr. Zmijewski noted, “In order for prior experience to serve as the foundation for evaluating merger efficiency claims at issue, the alleged cost savings in the prior merger must in fact be verifiable, merger specific efficiencies, and the two mergers must be sufficiently similar to apply the historical experience. (PX5003 at 021-22 (Zmijewski Rebuttal Report to Imburgia and Stern)). He also testified, “Somebody would go through and actually make sure that those efficiencies that fit into the category are—and for verification are appropriate efficiencies that would fit into the cognizable category. So you’d have to check to make sure that the efficiencies fit into the bucket that is relevant for offsetting anticompetitive effects.” (Zmijewski, Tr. 1579 (*in camera*)).

265. Tronox has more synergies to achieve from the Cristal transaction compared to the Exxaro transaction “because the Cristal business is so similar to the Tronox business that there is a lot more overlap.” (Mancini, Tr. 2748-49).

Response to Proposed Finding No. 265

The Proposed Finding is misleading and vague in that it fails to explain how or the extent to which the “Cristal business is so similar to the Tronox business.” In addition, Mr. Mancini’s testimony should be given little weight because he was not involved in developing the synergy estimates for the Exxaro transaction. (Mancini, Tr. 2822). The Proposed Finding is also incomplete in that it fails to address the question of whether any announced synergies from the Exxaro transaction were cognizable under the Horizontal Merger Guidelines. As Dr. Zmijewski noted, “In order for prior experience to serve as the foundation for evaluating merger efficiency claims at issue, the alleged cost savings in the prior merger must in fact be verifiable, merger specific efficiencies, and the two mergers must be sufficiently similar to apply the historical experience. (PX5003 at 021-22 (Zmijewski Rebuttal Report to Imburgia and Stern)). He also

testified, “Somebody would go through and actually make sure that those efficiencies that fit into the category are—and for verification are appropriate efficiencies that would fit into the cognizable category. So you’d have to check to make sure that the efficiencies fit into the bucket that is relevant for offsetting anticompetitive effects.” (Zmijewski, Tr. 1579 (*in camera*)).

266. [REDACTED]

Response to Proposed Finding No. 266

The Proposed Finding is incomplete. Dr. Zmijewski testified that { [REDACTED]
[REDACTED]
[REDACTED] } (Zmijewski, Tr. 1579-80 (*in camera*)). As Dr. Zmijewski noted, “In order for prior experience to serve as the foundation for evaluating merger efficiency claims at issue, the alleged cost savings in the prior merger must in fact be verifiable, merger specific efficiencies, and the two mergers must be sufficiently similar to apply the historical experience. (PX5003 at 021-22 (Zmijewski Rebuttal Report to Imburgia and Stern)). He also testified, “Somebody would go through and actually make sure that those efficiencies that fit into the category are—and for verification are appropriate efficiencies that would fit into the cognizable category. So you’d have to check to make sure that the efficiencies fit into the bucket that is relevant for offsetting anticompetitive effects.” (Zmijewski, Tr. 1579 (*in camera*)).

267. [REDACTED]

Response to Proposed Finding No. 267

The Proposed Finding is misleading in that, as the Horizontal Merger Guidelines make clear, [I]t is incumbent upon the merging firms to substantiate efficiency claims” (PX9085 at 033 (Horizontal Merger Guidelines); *see also* Zmijewski, Tr. 1544 (*in camera*)). Moreover, as Dr. Zmijewski noted, “In order for prior experience to serve as the foundation for evaluating merger efficiency claims at issue, the alleged cost savings in the prior merger must in fact be verifiable, merger specific efficiencies, and the two mergers must be sufficiently similar to apply the historical experience. (PX5003 at 021-22 (Zmijewski Rebuttal Report to Imburgia and Stern)). He also testified, “Somebody would go through and actually make sure that those efficiencies that fit into the category are—and for verification are appropriate efficiencies that would fit into the cognizable category. So you’d have to check to make sure that the efficiencies fit into the bucket that is relevant for offsetting anticompetitive effects.” (Zmijewski, Tr. 1579 (*in camera*)). The Proposed Finding cites no evidence or expert testimony that makes such a demonstration.

IV. THE RELEVANT GEOGRAPHIC MARKET IS BROADER THAN NORTH AMERICA, AND IS GLOBAL.

268. “[T]he relevant market in which to evaluate the likely competitive effects of the proposed transaction . . . is global.” (Shehadeh, Tr. 3202).²⁵

Response to Proposed Finding No. 268

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. As fully evidenced in Section III.A.ii. of Complaint Counsel’s Proposed Findings of Fact, sales to

²⁵ Dr. Ramsey Shehadeh is an expert in economics, industrial organization (“IO,” or “the study of how companies and customers interact in marketplaces”), and econometrics (“the application of statistics to economic data”). (Shehadeh, Tr. 3196). Dr. Shehadeh is a managing director and partner at National Economic Research Associates (“NERA”), and he is formerly the chair of NERA’s global antitrust practice. (Shehadeh, Tr. 3197). Dr. Shehadeh has a master’s and Ph.D. in economics from Cornell University, and a bachelor of science in mathematical economics from the University of Wisconsin at Madison. (Shehadeh, Tr. 3195-96). Dr. Shehadeh’s “exclusive” work over the past 25 years at NERA has been IO and econometrics, and the “vast majority” of that work has been “evaluating the competitive effects of mergers, acquisitions, joint ventures, and other business combinations.” (Shehadeh, Tr. 3197). Dr. Shehadeh has evaluated the competitive effects of “hundreds” of mergers and acquisitions, including in the chemical industry. (Shehadeh, Tr. 3197-99). Dr. Shehadeh has also evaluated the competitive effects of global acquisitions, including global mergers and acquisitions in the chemical industry. (Shehadeh, Tr. 3199).

customers in the United States and Canada (“North America”) is the relevant geographic market. (CCFF ¶¶ 134-322).

269. Dr. Shehadeh conducted an economic analysis to determine the proper geographic market for this case. (Shehadeh, Tr. 3203-04). Dr. Shehadeh’s approach for defining the geographic market in this case is the hypothetical monopolist test as described in the Horizontal Merger Guidelines, “starting with the candidate market that had been proposed by Dr. Hill,” i.e., “sales to customers in North America.” (Shehadeh, Tr. 3203-04).

Response to Proposed Finding No. 269

The Proposed Finding is factually inaccurate. Dr. Shehadeh did not properly implement the hypothetical monopolist test, as set forth in the Horizontal Merger Guidelines. (CCFF ¶¶ 360-63). Dr. Shehadeh erred by including potential supply response in his market definition analysis, rather than focusing solely on demand substitution factors, as clearly instructed by the Horizontal Merger Guidelines. (CCFF ¶¶ 360-61).

270. The “economic evidence” confirms “that the market is broader than North America.” (Shehadeh, Tr. 3204-05). “[T]he global trade” data and “the relationship between prices globally . . . all demonstrate that the market is global in scope.” (Shehadeh, Tr. 3207). The specific “sources of economic evidence” demonstrating that the market for TiO₂ is global include “global trade patterns,” in particular “the magnitude of global trade of titanium dioxide relative to both production and consumption, the movement over time, the elasticity of global trade that is evident in the variation of trade over time and across countries, including the sources of trade into North America and the variation in trade into North America.” (Shehadeh, Tr. 3204-05). This economic evidence also includes “the comovement of prices globally, including applying accepted economic techniques [used by FTC economists] to evaluate that comovement of prices statistically.” (Shehadeh, Tr. 3204-05). “The fabric of that economic evidence points to a conclusion that across the board that the relevant market is global.” (Shehadeh, Tr. 3282-83).

Response to Proposed Finding No. 270

The Proposed Finding is vague, factually inaccurate, and contrary to the weight of the evidence. The “economic evidence” Dr. Shehadeh cites does not support the conclusion that the market is broader than sales to North American customers. (Shehadeh, Tr. 3204-05).

First, Dr. Shehadeh cites “trade data” and “trade patterns” based on suppliers’ movements of TiO₂, not the movement of TiO₂ by customers. (Shehadeh, Tr. 3207). But in a market based

on locations of customers, the hypothetical monopolist test asks whether *customers* could defeat a SSNIP imposed a monopolist, not whether there would be a supply response. (CCFF ¶ 259; PX9085 at 017-18 (Horizontal Merger Guidelines, § 4.2.2)).

Second, the term “elasticity of global trade” is vague and not defined. To the extent Respondents are referring to the elasticity of imports of chloride or rutile TiO₂ into North America, Dr. Shehadeh’s import elasticity calculations are incorrect, because they suffer from a multicollinearity problem, and are based on a misrepresentation of an estimate from the 2006 academic paper by Broda and Weinstein. (CCFF ¶¶ 672–73).

Third, comovement of prices are neither “used by FTC economists” nor the “accepted economic technique” used in defining relevant antitrust markets. (Shehadeh, Tr. 3204-05). The paper that Dr. Shehadeh cites to in support of this assertion is from 1993, and Dr. Shehadeh could not cite any academic literature since 1993 that supports the use of price comovement to define relevant markets. (Shehadeh, Tr. 3597-98; *see also* CCFF ¶ 358). Moreover, Dr. Shehadeh had, at most, only 24 observations for which to observe comovement or cointegration, when even 100 observations is not sufficient for the same cointegration analysis employed by Dr. Shehadeh. (Shehadeh, Tr. 3608-09; *see also* CCFF ¶ 357).

A. Significant International Trade Flows Demonstrate the Global Nature of the TiO₂ Market.

271. Global trade flow data show “significant trade flows around the globe,” including “trade both into and out of North America in very significant volumes.” (Shehadeh, Tr. 3212).

Response to Proposed Finding No. 271

The Proposed Finding is vague as to the meaning of “significant” and as to the product or products referenced. To the extent the Proposed Finding refers to trade of TiO₂, it is misleading, because it includes trade of all sulfate TiO₂, including sulfate anatase grades which are not part of the relevant markets alleged by Complaint Counsel or the market proposed by Respondents.

(CCFF ¶¶ 26-352). Further, the Proposed Finding is factually inaccurate with respect to chloride TiO₂ sold to the customers in North America, which is a relevant antitrust market proffered by Complaint Counsel, because “trade . . . into . . . North America in very significant volumes” does not exist as only {█} of chloride TiO₂ sold in North America consist of chloride TiO₂ imported from abroad. (CCFF ¶ 141).

272. Overall, “69% of consumption of TiO₂” in the world crosses international borders. (Romano, Tr. 2233). This TiO₂ “comes from trade flows, meaning that it’s sold in a country that it’s not produced.” (Romano, Tr. 2233).²⁶

Response to Proposed Finding No. 272

The Proposed Finding is misleading and incomplete because it includes sulfate anatase grades of TiO₂, which are not part of the relevant markets alleged by Complaint Counsel or the market proposed by Respondents. (CCFF ¶¶ 26-352). Additionally, {█} of chloride TiO₂ sold in North America are manufactured within the United States and Canada (CCFF ¶ 141). The Proposed Finding is also misleading in that {█} (PX0022, Exhibit 7 (Tronox Response to Complaint Counsel’s First Set of Interrogatories) ({█} } (in camera)). Thus, for example, very little of Tronox’s production at its Botlek plant stays in the Netherlands, but about 80% of the Botlek production stays within the EU. (Mei, Tr. 3161).

Footnote 26 to the Proposed Finding is vague and misleading. Respondents cite only a single customer for the proposition that large coatings customers typically have “centralized, worldwide raw materials buying functions,” but even for that customer, chloride TiO₂ purchases

²⁶ It is also typical for large coatings companies to have centralized, worldwide raw materials buying functions. (Malichky Tr. 625) {█}

are negotiated and priced on a regional basis. (CCFF ¶¶ 175, 189). It is true that TiO₂ is often measured in metric tons, but in North America, unlike in other regions, chloride TiO₂ is typically priced per pound. (CCFF ¶ 447; PX1048 at 001-02 (Duvekot email to Romano) (*in camera*)).

273. All told, “[t]he magnitude of global trade flows overall, the magnitude relative to production, and the magnitude relative to consumption, and . . . the variability and flexibility over time, including increases to meet demand in North America, are inconsistent with a market limited to North America and, in fact, reflect the global nature of demand and supply” in the TiO₂ market. (Shehadeh, Tr. 3223).

Response to Proposed Finding No. 273

The Proposed Finding is inaccurate, vague, and contrary to the weight of the evidence. Contrary to the vague statements in the Proposed Finding, chloride TiO₂ imports to North America do not “increase[] to meet demand in North America”; rather, Dr. Hill showed that the limited imports of chloride TiO₂ into North America do not materially change in response to changes in price. (CCFF ¶ 642).

Further, the Proposed Finding’s assertion of the “global nature of demand and supply,” which references Dr. Shehadeh, is contradicted by an array of real world evidence, including the Respondents’ testimony and ordinary course documents that emphasize the regional nature of TiO₂ pricing (CCFF ¶¶ 151-59, 199-225), by customer testimony that costs and logistics make it difficult to source from overseas TiO₂ producers to take advantage of theoretical arbitrage opportunities (CCFF ¶¶ 261-89), by customer and competitor testimony that the asserted “global” competitors in China have not been substantial competitive alternatives to chloride TiO₂ in North America (CCFF ¶¶ 385-86, 748-54), and by Tronox public disclosures that producers in other regions such as China do not have a material competitive presence in North America. (CCFF ¶ 745; *see also* PX7037 (Pickett, Dep. at 58-59) (Cristal’s GM for Sales in the Americas testifying

that { [REDACTED] } (in camera)).

a. All Major TiO₂ Producers Produce and Sell TiO₂ in a Global Network.

274. The global TiO₂ producers (Chemours, Cristal, Venator, Lomon Billions, Kronos, Tronox) produce, sell, and ship product all over the world. (RX0171.0027; Shehadeh, Tr. 3210-11).

Response to Proposed Finding No. 274

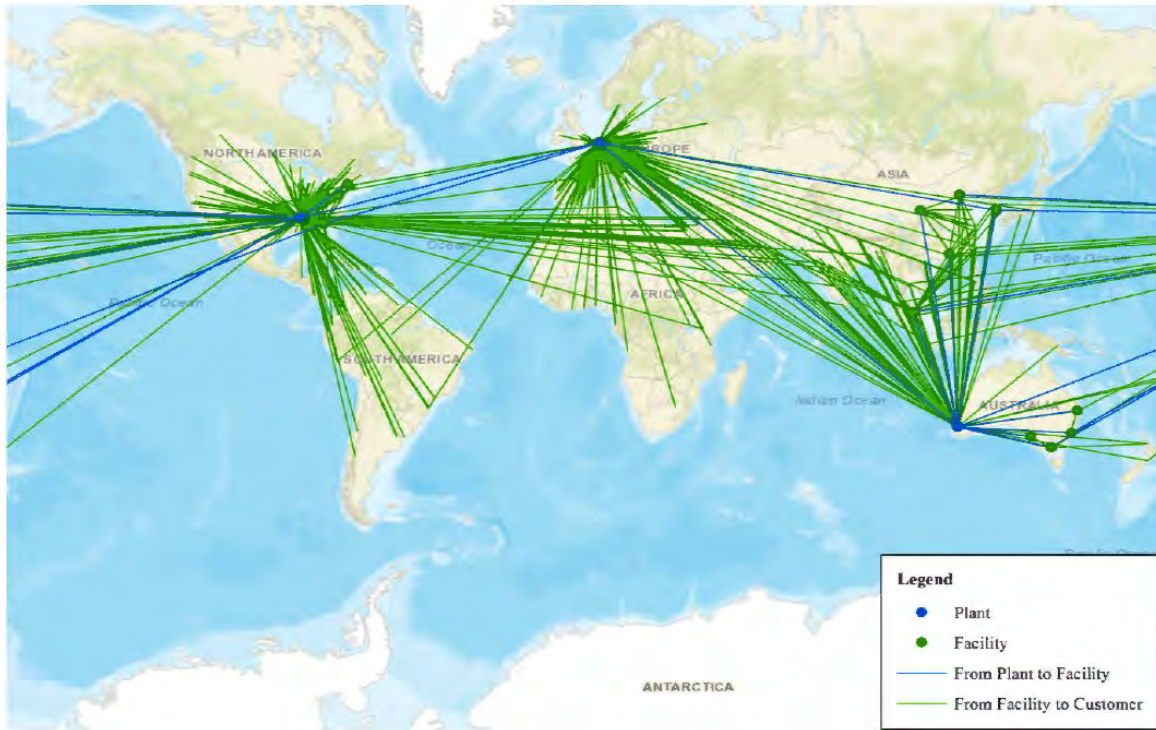
The Proposed Finding is misleading and is unsupported by the citations. Respondents have cited to the Expert Report of Mr. Stern, which simply contains a conclusory and uncited factual statement and should be given little weight. The cited portion of Mr. Stern's report does not even refer to any of the TiO₂ producers described in the Proposed Finding. (RX0171 at 0027 (Stern expert report) (in camera)).

Respondents also cite to Dr. Shehadeh's testimony which referred to Figure 1 of his expert report, but Figure 1 is misleading and of limited probative value. (See CCRRFF ¶ 275, below). There are no quantities or other information in Figure 1 that indicate the relative values of the information that the bunched lines purport to represent. (RX0170 at 0011 (Fig. 1) (Shehadeh expert report) (in camera)). Moreover, a chart showing Tronox's transportation of TiO₂ does not support any conclusions about the movement of TiO₂ by other suppliers or customers. The inclusion of "TiO₂" rather than chloride TiO₂ is also misleading, because it would include the transportation of sulfate anatase TiO₂, which is not part of the relevant markets alleged by Complaint Counsel or the market proposed by Respondents. (CCFF ¶¶ 26-352).

Additionally, Lomon Billions is not a "global TiO₂ producer" by any meaning of the term, as there is no evidence it produces TiO₂ anywhere other than in China, primarily for sale in the Chinese domestic market. (CCFF ¶¶ 396, 797-800).

275. For example, as shown in Shehadeh Figure 1 (RX0170.0011), TiO₂ product shipped from manufacturing plants to facilities and warehouses demonstrate that TiO₂ “is moving around the globe from plants around the globe.” (Shehadeh, Tr. 32111; *see also* Mei, Tr. 2150-55 (describing Tronox’s global inventory movements)).

Figure 1
TiO₂ Flows from Tronox Plants to Facilities and Customers
2016



Response to Proposed Finding No. 275

The Proposed Finding is incomplete, misleading and vague. The citation to the testimony of Rose Mei, which should refer the transcript pages of 3150-55, describes Tronox’s logistics infrastructure for TiO₂ feedstock and pigment. (Mei, Tr. 3150-55). The limited scope of Ms. Mei’s cited testimony contains no detail about amounts of TiO₂ that shipped, the costs, including duties, or the grades. Further, there are no quantities or other information in Shehadeh Figure 1 that indicate the relative values of the information that the bunched lines purport to represent. (RX0170 at 0011 (Fig. 1) (Shehadeh expert report) (*in camera*)). Moreover, a chart showing Tronox’s transportation of TiO₂ does not support any conclusions about the movement of TiO₂ by other suppliers or customers. The inclusion of “TiO₂” rather than chloride TiO₂ also is misleading,

because it would include transportation of sulfate anatase TiO₂, which is not part of the relevant markets alleged by Complaint Counsel or the market proposed by Respondents. (CCFF ¶¶ 26-352).

276. Shehadeh Figure 1 (RX0170.0011) shows “the scope of trade and logistical movements out of [Tronox’s] facilities.” (Shehadeh, Tr. 3210).

Response to Proposed Finding No. 276

The Proposed Finding is inaccurate. Because there are no quantities associated with the lines, it cannot demonstrate the “scope” of Tronox’s transportation of TiO₂. (RX0170 at 0011 (Fig. 1) (Shehadeh expert report) (*in camera*)). Other deficiencies of this Proposed Finding are detailed in CCRRFF ¶ 275.

277. Tronox has a global network to produce TiO₂, including mines, feedstock facilities, pigment plants, and warehouses all over the world. (Mei, Tr. 3149-50).

- a. Tronox’s mines and feedstock facilities are located in South Africa and Australia. (Mei, Tr. 3150-3151). Tronox’s feedstock “need[s] to cross ocean to reach our pigment plants” in Europe and the United States. (Mei, Tr. 3151).
- b. Tronox’s pigment plants are located in Hamilton, Mississippi; Botlek, The Netherlands; and Kwinana, West Australia. (Mei, Tr. 3151; Romano, Tr. 2231).
- c. Tronox has 10 warehouses globally that it uses as distribution centers: in Rotterdam, The Netherlands; South Africa; South Korea; Malaysia; Dubai; two in China; and four in Australia. (Mei, Tr. 3154). Tronox also ships TiO₂ directly to customers all over the world. (Mei, Tr. 3153). Tronox ships its TiO₂ pigment globally using “ocean bulk and ocean container.” (Mei, Tr. 3152-53). On land, Tronox ships pigment by rail or truck. (Mei, Tr. 3155).

Response to Proposed Finding No. 277

Complaint Counsel has no specific response.

278. Tronox “export[s] TiO₂ all over the world.” (Romano, Tr. 2237).

Response to Proposed Finding No. 278

The Proposed Finding is incomplete, vague and misleading, as it does not specify any information other than Tronox transports some uncertain amount of TiO₂ internationally. In addition, as Mr. Romano testified in an investigational hearing, { [REDACTED] }

[REDACTED]
[REDACTED] }

(PX7001 (Romano, IHT at 74-75) (*in camera*)).

279. Tronox manages its TiO₂ and feedstock inventory “globally.” (Mei, Tr. 3164). As a result, “if any region is short, we will move products either from other plant or from other warehouses.” (Mei, Tr. 3164). These cross-regional transfers are a “very common practice.” (Mei, Tr. 3164).

Response to Proposed Finding No. 279

The Proposed Finding is misleading and contrary to the weight of the evidence. Whether Tronox transports or “manages” its TiO₂ inventory globally does not address its practice of charging different prices in different regions. (CCFF ¶¶ 151-59, 199-225). Nor does this Proposed Finding, or any other Proposed Finding by Respondents, address whether any other chloride TiO₂ suppliers “manage” their inventories “globally.” On the contrary, the record is replete with evidence such as Tronox and Cristal’s ordinary course documents and their executives testimony confirming the market reality of regional TiO₂ pricing and sales practices. (CCFF ¶¶ 199-225).

In addition, the reference in the Proposed Finding to a “very common practice” of “cross-regional transfers” is also highly misleading. { [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED] } (Mei, Tr. 3179 (*in camera*)).

280. Tronox’s customer service group is located around the world and services a global customer base. (Romano, Tr. 2228). Tronox has a customer service group in Australia that’s responsible for customers in Asia; a customer service group in The Netherlands that’s responsible for customers in Europe, Africa, and the Middle East; and a customer service group in North America that’s responsible for North America, which includes Canada and Mexico, and also Latin America. (Romano, Tr. 2228).

Response to Proposed Finding No. 280

The Proposed Finding is misleading and contrary to the weight of the evidence. As Mr. Romano's cited testimony in the Proposed Finding indicates, Tronox's customer service operates on a regional, not global basis. (Romano, Tr. 2228; *see also* PX7041 (Veazey, Dep. at 78) ({" [REDACTED] }) (*in camera*)). {" [REDACTED] } (PX7000 (Snider, IHT at 24, 29) (*in camera*)). {" [REDACTED] } (PX7000 (Snider, IHT at 29-30) (*in camera*)).

281. Tronox ships TiO₂ to more than 1,200 locations worldwide and sells its TiO₂ product "globally in over 90 countries." (Mei, Tr. 3155; Romano, Tr. 2231). Each year, Tronox exports approximately 25% of the production at its Hamilton, Mississippi plant to foreign nations (Mei, Tr. 3161; Shehadeh, Tr. 3210). Tronox exports more than 90% of the production at its Kwinana plant outside Australia. (Mei, Tr. 3161). As Figure 1 shows, "the product is moving around the globe from plants around the globe." (Shehadeh, Tr. 3211).

Response to Proposed Finding No. 281

The Proposed Finding is incomplete and misleading. For example, the Proposed Finding refers to exports of 25% of the production at Hamilton to "foreign nations." However, that 25% exported presumably includes exports to Canada, so on its face, the 25% estimate is vague and misleading. Relatedly, {" [REDACTED] } (PX7001 (Romano, IHT at 83) (*in camera*)).

The reference to exports from Australia is also misleading. As Mr. Romano described, {" [REDACTED] } (PX7001 (Romano, IHT at 20) (*in camera*)). This is not the case {" [REDACTED] } (PX7001 (Romano, IHT at 20) (*in camera*)).

Complaint Counsel also reiterates the deficiencies of Shehadeh Figure 1, as detailed in CCRRFF ¶ 275. As an indication of those deficiencies, one of the lines in Figure 1 has product moving from Australia to the U.S., but the simplistic chart does not account for, measure, or reflect in any way the volumes of material, the relevance of which are indicated by the investigational hearing testimony of Mr. Romano that { [REDACTED] } (PX7001 (Romano, IHT at 75) (*in camera*)).

282. Cristal produces TiO₂ at facilities in Ashtabula, Ohio; Yanbu, Saudi Arabia; Stallingborough in the U.K; Thann, in France; Bunbury, Australia; and Tikon, in Fuzhou, China. (PX0002-11-12). These facilities produce TiO₂ for customers all over the world. (*See* PX0013).

Response to Proposed Finding No. 282

The Proposed Finding is inaccurate, incomplete, and not supported by the citation. There is no pincite to PX0013, and there is nothing in PX0013, { [REDACTED] } (PX0013 (Cristal Second Request Response, Exhibit 3-3) (*in camera*)). Moreover, the Proposed Finding is directly contradicted by record evidence; for example, { [REDACTED] } (CCFF ¶ 818; PX7000 (Snider, IHT at 70) ({ [REDACTED] }) (*in camera*); PX7000 (Snider, IHT at 71) ({ [REDACTED] }) (*in camera*)).

283. TiO₂ is traded internationally in significant quantities because TiO₂ has no expiration date, a virtually infinite shelf life, and no safety issues involved with transporting TiO₂. (Mei, Tr. 3157-58). TiO₂ is easily transported by truck, rail, or sea. (Mei, Tr. 3154-57). There are “no special requirement in terms of handling or transportation” of TiO₂. (Mei, Tr. 3156).

Response to Proposed Finding No. 283

The Proposed Finding is not supported by the citation and is misleading. Under questioning about whether TiO₂ has an expiration date, Ms. Mei stated she is not an expert, Tronox's technical group is better positioned to answer the question, and that it is only as far as she knows that there is not an expiration date. (Mei, Tr. 3157 (JUDGE CHAPPELL: You talked about an expiration date. Does titanium sulfate or the -- does the white powder have an expiration date? THE WITNESS: I'm not expert of the product, so our technical group might be better one to answer that question. But to my knowledge, our transportation doesn't -- there's no requirement on the warehouse in terms of expiration date.)). Importantly, Ms. Mei did not provide testimony on pages 3157 to 3158 of the trial transcript that TiO₂ is traded internationally in significant quantities, nor did she link that proposition to an expiration date, shelf life, or safety issues. (Mei, Tr. 3157-58).

As to whether there are safety issues, the Proposed Finding is not supported by the evidence cited because the evidence is internally inconsistent. Ms. Mei testified that there are dangers, specifically with regard to weight and the need for TiO₂ to be moved by forklift. (Mei, Tr. 3157). The Proposed Finding is not supported by the evidence cited, factually inaccurate, and contrary to the weight of the evidence regarding the proposition that "TiO₂ is easily transported by truck, rail, or sea." There is no statement by Ms. Mei that supports this Proposed Finding. (Mei, Tr. 3157). The record evidence shows that transport by rail, truck and sea differ in ease. (CCFF ¶¶ 209, 265, 268-90, 321, 789).

284. TiO₂ is also relatively inexpensive to ship across the globe. TiO₂ costs about 3% of the total price to move it into and out of the United States. (Mei, Tr. 3158). Indeed, shipping TiO₂ internationally is so economical that total shipping costs, including tariffs and taxes, can be lower for TiO₂ shipped internationally than TiO₂ shipped domestically. (Mei, Tr. 3159-60). For instance, it costs less to ship TiO₂ from Australia to Los Angeles than it does to ship it from Hamilton, Mississippi to Los Angeles. (Mei, Tr. 3159).

Response to Proposed Finding No. 284

The Proposed Finding is misleading, factually inaccurate, and contrary to the weight of the evidence, including Tronox's own submissions. Tronox admits that the cost to transport TiO₂ is {█}, and tariffs add 5 to 6%. (CCFF ¶ 268). Furthermore, Ms. Mei's testimony on the cost of shipping chloride TiO₂ from Australia to Los Angeles does not include the import duty, does not include the additional cost of shipping TiO₂ to the customer location, is vague in that it does not provide the relevant time period for this price difference, and is irrelevant to determining the costs of transporting TiO₂ from China or Europe to customer locations in North America. (Mei, Tr. 3159). Finally, despite the alleged low cost of transporting TiO₂ from Australia to Los Angeles, neither Tronox nor Cristal regularly import TiO₂ from Australia to North America. (PX7001 (Romano, IHT at 75) ({█})) (*in camera*); PX0022 (Tronox's Response to Complaint Counsel's First Set of Interrogatories, Exhibit 7) (*in camera*)).

Tronox's Linda Veazey, the company's Director of Outbound Logistics, also contradicted this Proposed Finding, testifying that most of Hamilton's production {█} {█} (PX7041 (Veazey, Dep. at 64) (*in camera*)).

b. Substantial Imports into and Exports from North America Confirm There Is No Narrow, North America-Only TiO₂ Market.

285. "North America is not an island." (Shehadeh, Tr. 3229). In 2010 and 2016, total trade volume of TiO₂ in North America was "over 100 percent," which is "quite significant" and indicates substantial openness to trade in North America. (Shehadeh, Tr. 3228-29).

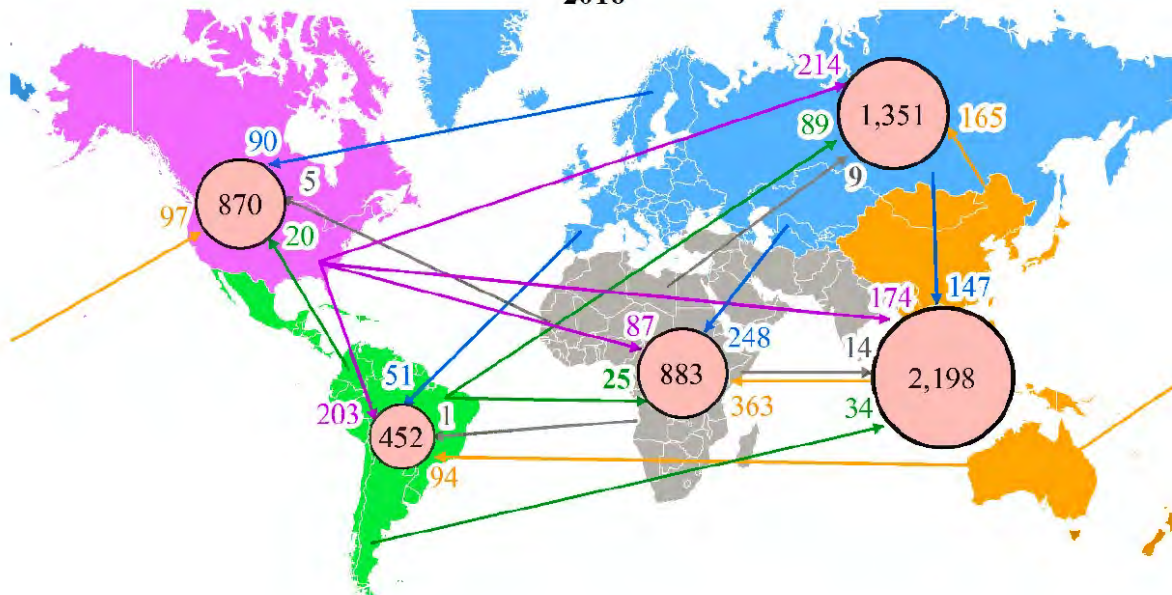
Response to Proposed Finding No. 285

The Proposed Finding is not supported by the evidence cited because evidence from an expert is being used as support for a factual proposition that should be proven by witness testimony or documents. (Tr. 3254, 3794). Moreover, the Proposed Finding is vague as it is unclear to what

“total trade volume” is referring. The term “substantial openness to trade in North America” is similarly vague and undefined. Dr. Shehadeh’s chart, the results of which are driven by factors such as the inclusion of all TiO₂, including sulfate anatase grades, as well as the inclusion of all TiO₂ exported from North America, does not begin to address the issue of geographic market as framed by the Horizontal Merger Guidelines. As established by the overwhelming evidence in the record, a North American market is appropriate because (1) TiO₂ producers are able to price discriminate by region; and (2) the ability to arbitrage is limited. (PX9085 at 017 (Horizontal Merger Guidelines, § 4.2.2); CCF ¶¶ 135, 148-225, 259-300).

286. As depicted by Shehadeh Figure 2 (RX0170.0012), there are “significant trade flows around the globe, and we see trade both into and out of North America in very significant volumes.” (Shehadeh, Tr. 3212).

Figure 2
Global Trade Flows Between Regions
2016



Response to Proposed Finding No. 286

The Proposed Finding is misleading and vague because it does not explain which product is referenced. Shehadeh Figure 2 is based off data from the IHS Global Trade Atlas, which includes all sulfate TiO₂, include anatase grades. (Shehadeh, Tr. 3561-62). Consequently, these

figures are all overstated, because they include trade of product that Respondents concede is not at issue.

287. Shehadeh Figure 2 (RX0170.0012) shows each geographic region's "apparent consumption" of TiO₂ (production plus imports minus exports) in 2016. (Shehadeh, Tr. 3212; RX0170.0012). The unit is thousands of metric tons per annum ("ktpa"). (Shehadeh, Tr. 3213). The other numbers are "the imports and/or deliveries into those destination countries, with the lines showing the origination." (Shehadeh, Tr. 3212-13). For instance, apparent consumption for the United States and Canada²⁷ in 2016 was 870 ktpa. (Shehadeh, Tr. 3213).

Response to Proposed Finding No. 287

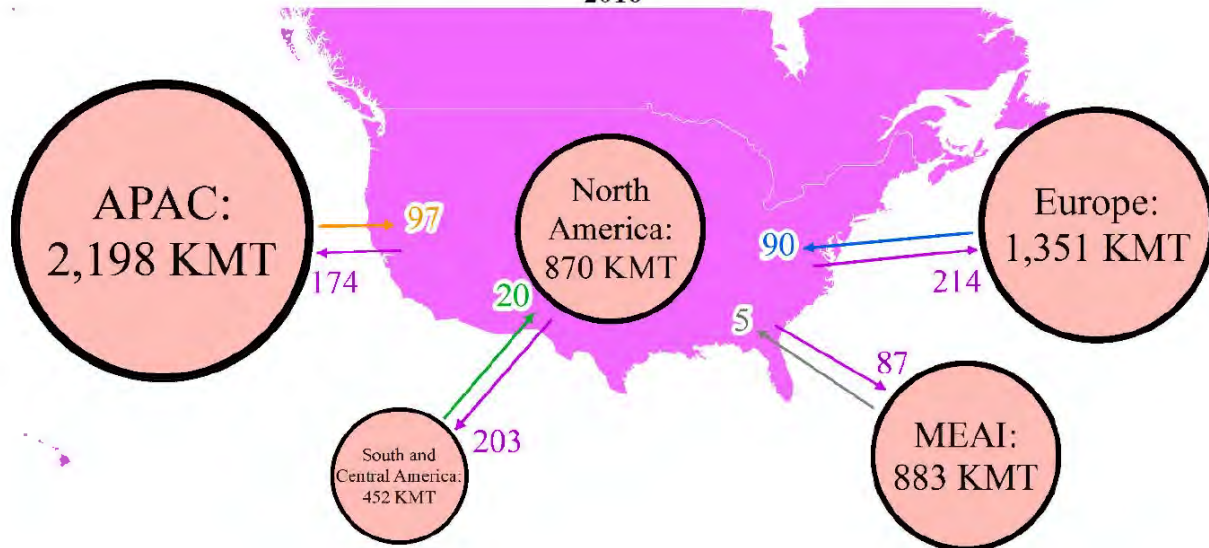
The Proposed Finding is misleading for the reasons stated in CRRFF ¶ 286. Moreover, Footnote 27 to the Proposed Finding is misleading and inaccurate. Under cross-examination, Dr. Shehadeh admitted that Shehadeh Figure 2 used regions as defined by Cristal, which defines North America as the United States and Canada. (Shehadeh, Tr. 3561; CCF ¶ 147). Indeed, that is the explanation that Dr. Shehadeh gave in his own expert report, which appears in Respondents' citation. (RX0170 at 0013 (¶ 6) (discussing Figure 2: "Regions are defined as North America . . . consistent with how Cristal identifies its regions") (*in camera*)).

Footnote 27 to the Proposed Finding is also misleading and inaccurate, because Tronox has similarly included Mexico in Latin America in ordinary course documents. (CCFF ¶ 147).

288. Shehadeh Figure 3 (RX0170.0013) shows "this parallel trade in both directions" specifically for North America. (Shehadeh, Tr. 3215).

²⁷ Shehadeh Figure 2 depicts "North America" as the United States and Canada minus Mexico because Dr. Shehadeh's analysis of geographic market "start[ed] with the candidate market that Dr. Hill has proposed," which excludes Mexico from North America. (Shehadeh, Tr. 3215-16; RX0170.0013).

Figure 3
Imports into and Exports out of North America
2016



Response to Proposed Finding No. 288

The Proposed Finding is misleading and vague for the reasons stated in CCRFF ¶ 286, above, as it similarly does not specify product, and relies on the same IHS Global Trade Data, which includes all sulfate TiO₂, include anatase grades.

289. As shown in Shehadeh Figure 3 (RX0170.0013), imports to the United States and Canada in 2016 were 90 ktpa from Europe; 5 ktpa from the Middle East/Africa; 20 ktpa from South and Central America; and 97 ktpa from Asia Pacific/China. (RX0170.0013). Exports from the United States and Canada in 2016 were 214 ktpa to Europe; 174 ktpa to Asia; 87 ktpa to Africa; and 203 ktpa to Latin America. (Shehadeh, Tr. 3213-14; RX0170.0013).

Response to Proposed Finding No. 289

The Proposed Finding is incomplete, misleading and vague for the reasons stated in CCRFF ¶ 286, above, as it similarly does not specify product, and relies on the same IHS Global Trade Data, which includes anatase TiO₂. Further, Dr. Shehadeh's simple recitation of numbers without providing context is misleading. For example, {

[REDACTED]

[REDACTED]

[REDACTED] } (PX7001

(Romano, IHT at 74-75) (*in camera*); PX7035 (Christian, Dep. at 77-78) (*in camera*); CCF ¶ 647).

290. These global trade flows into and out of North America show “the linkage of demand in North America to supply around the world.” (Shehadeh, Tr. 3229).

Response to Proposed Finding No. 290

The Proposed Finding is misleading, and the phrase “linkage of demand in North America to supply around the world” is vague. As described, there is TiO₂ pigment consumed in North America that is supplied from outside of North America, including the sulfate anatase grades that *all* of Respondents’ references to TiO₂ shipments have included, and { [REDACTED] [REDACTED] [REDACTED] } (PX7001 (Romano, IHT at 74-75) (*in camera*); PX7035 (Christian, Dep. at 77-78) (*in camera*); CCF ¶ 647). Respondents’ vague reference to a “linkage” does not overcome the overwhelming record evidence that TiO₂ producers in North America set prices by customer location, and that customers in North America would not defeat a SSNIP through arbitrage. (CCF ¶¶ 135, 148-225, 259-300).

291. Total imports of TiO₂ into North America are “around 150 to 200,000 kilotons per year,” and total exports of TiO₂ from North America are “around 600 to 700,000 kilotons per year.” (Shehadeh, Tr. 3214).

Response to Proposed Finding No. 291

The Proposed Finding is misleading, because it includes imports and exports of sulfate TiO₂, including anatase TiO₂, which Respondents concede is not at issue.

292. From 2002 to 2016, annual imports of rutile TiO₂ into North America varied from 75,000 metric tons per year to 200,000 metric tons per year. (Hill, Tr. 1901; PX5000-035, Fig. 13; Shehadeh, Tr. 3217-18).

Response to Proposed Finding No. 292

Complaint Counsel has no specific response.

293. In 2016, roughly 15 percent of the rutile titanium dioxide consumed in North America was imported. (Hill, Tr. 1901).

Response to Proposed Finding No. 293

Complaint Counsel has no specific response.

294. Even though the North American market currently has more production capacity than is required by customers, hundreds of thousands of tons of TiO₂ are imported by customers yearly. (Turgeon, Tr. 2670-71).

Response to Proposed Finding No. 294

The Proposed Finding is inaccurate and contrary to the weight of the evidence. Respondents' own expert pegged imports of rutile TiO₂ into North America as ranging from 75 ktpa to 200 ktpa from 2002 to 2016, with imports of TiO₂ into North America at approximately 150 ktpa in 2016. (RFF ¶¶ 292-93, Shehadeh, Tr. 3217). Moreover, the Proposed Finding is misleading, because { [REDACTED] } the TiO₂ imported into North America is sulfate TiO₂, not chloride TiO₂. (CCFF ¶ 141 (only { [REDACTED] } of North American TiO₂ sales is imported chloride TiO₂)). Further, the cite to Mr. Turgeon's testimony regarding TiO₂ imports does not account for imports of TiO₂ grades, including chloride grades, [REDACTED] [REDACTED] (PX7001 (Romano, IHT at 74-75) (*in camera*); PX7035 (Christian, Dep. at 77-78 (*in camera*))).

295. Imports of TiO₂ into North America show significant "elasticity of import supply over time," which is "reflected in the variation of imports to respond to demand in North America." (Shehadeh, Tr. 3217-18).

Response to Proposed Finding No. 295

The Proposed Finding is vague, misleading and contrary to the weight of the evidence. The cited testimony of Dr. Shehadeh is based on his "perspective" that Figure 12 in Dr. Hill's Initial Report showed "elasticity of import supply over time," a time that stretched to 15 years, and in which the highest volume of TiO₂ imports occurred over ten years ago. (PX5000 at 032-33 (¶ 78

& Fig. 12) (Hill Initial Report) (*in camera*). Contrary to the vague perspective that is at the heart of the Proposed Finding, Dr. Hill's economic analysis showed that imports of chloride TiO₂ to North America do not meaningfully vary in response to price changes. (CCFF ¶¶ 642-45; Hill, Tr. 1775: "[I]mports do increase in response to increases in the North American price but that the increase is not large."); PX5000 at 011-12 (¶ 21) (Hill Initial Report) ("Imports of chloride titanium dioxide are unlikely to offset any price increase that results from the merger.") (*in camera*). Dr. Hill's empirical conclusion is consistent with the extensive testimony of customers regarding their reliance on North American producers of chloride TiO₂ (CCFF ¶¶ 261-98), with the evidence of regional pricing decisions by TiO₂ producers (CCFF ¶¶ 151-59, 199-225), and with the substantial evidence of persistent price differences that have existed between North America and other regions of the world. (CCFF ¶¶ 232-58).

296. From 2002 to 2016, imports of TiO₂ into North America "var[ie]d from a high in excess of 200,000 tons per year to a low of approximately 75,000 tons per year." (Shehadeh, Tr. 3217-18).

Response to Proposed Finding No. 296

The Proposed Finding is misleading and inaccurate in that there was only a single year in which rutile TiO₂ imports reached 200,000 tons, and that was 2005. Imports of chloride TiO₂, as Dr. Hill's Figure 12 shows, have been much lower. (PX5000 at 032-33 (¶ 78 & Fig. 12) (Hill Initial Report) (*in camera*)).

297. The significant magnitude and variation in imports of TiO₂ into North America is "striking" and "reflects the flexibility of import supply to respond to changes in demand, including demand that would arise in response to a SSNIP [small but significant nontransitory increase in price] in the hypothetical monopolist test, the ability to respond to that in North America." (Shehadeh, Tr. 3217-18; PX5000-033, Figure 12).

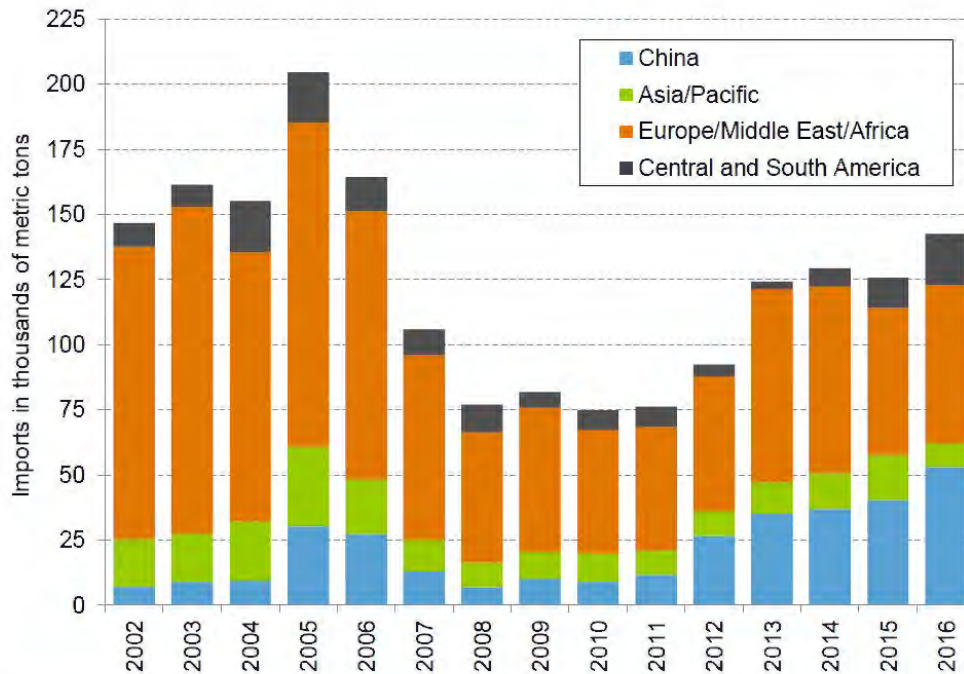
Response to Proposed Finding No. 297

The Proposed Finding is vague, misleading and contrary to the weight of the evidence for the reasons described in CCRRFF ¶ 295, above. Further, within Dr. Hill's market definition analysis, consistent with the Horizontal Merger Guidelines, imports are properly considered part of the hypothetical monopolist. (CCFF ¶¶ 360-62; *see also* PX9085 at 017-18 (Horizontal Merger Guidelines, § 4.2.2)). Because the Horizontal Merger Guidelines follow the demand-centric approach for the market definition analysis, it is improper to consider supply-side responses, such as import response, while determining the scope of a relevant market. (CCFF ¶ 362; PX9085 at 007 (Horizontal Merger Guidelines, § 4); *see also* PX5004 at 034 (¶¶ 77-79) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

298. Imports of TiO₂ into North America also show a “variation of the origin countries,” including, more recently, increases from China. (Shehadeh, Tr. 3220-21). UN Comtrade data reflecting imports of TiO₂ into North America by “country of origin” is depicted in Hill Figure 13 (PX5000-035).²⁸ (Shehadeh, Tr. 3220-21).

²⁸ Dr. Shehadeh testified that he “agree[s] with” the underlying UN Comtrade data reflected in Figure 13 from the expert report of Dr. Hill, the FTC's economist, even though he “do[es] not agree with [Dr. Hill's] conclusion” from this data. (Shehadeh, Tr. 3221-22).

Figure 13. North America imports by region of origin



Source: UN Comtrade data.

Response to Proposed Finding No. 298

The Proposed Finding is misleading and vague. The increase in imports from China are of sulfate TiO₂, which is not a replacement for chloride TiO₂ for North American customers. (CCFF ¶¶ 31, 808-09). Figure 13, created by Dr. Hill, shows that sulfate TiO₂ from Europe has been replaced by sulfate TiO₂ from China. (PX5000 at 035 (¶ 82) (citing Figure 13 to demonstrate that “growth in Chinese imports has merely displaced other sulfate imports rather than expanding the market for sulfate imports”) (*in camera*); see also CCFF ¶¶ 745-812).

299. As Hill Figure 13 (PX5000-035) shows, “when the peak imports over [the period 2002-2016] were achieved in 2005 . . . the origins were largely Europe. More recently, as we have seen imports increase, you will see that the origin was much more China, and that’s consistent with what we’ve learned about—everything about the rise of China as a global supplier of titanium dioxide.” (Shehadeh, Tr. 3220-21). This data shows “flexibility depicted in the variation of the origin countries.” (Shehadeh, Tr. 3220-21).

Response to Proposed Finding No. 299

The Proposed Finding is misleading and vague. The increase in imports from China are of sulfate TiO₂, which is not a replacement for chloride TiO₂ for North American customers. (CCFF ¶¶ 31, 808-09). Figure 13, created by Dr. Hill, shows that sulfate TiO₂ from Europe has been replaced by sulfate TiO₂ from China, not that Chinese producers are “global suppliers of titanium dioxide” nor that Chinese producers can offer chloride TiO₂ to North American customers. (PX5000 at 035 (¶ 82) (citing Figure 13 to demonstrate that “growth in Chinese imports has merely displaced other sulfate imports rather than expanding the market for sulfate imports”) (*in camera*); *see also* CCFF ¶¶ 745-812).

300. From 2010 to 2016, Chinese imports of TiO₂ into North America increased by “approximately five times.” (Shehadeh, Tr. 3220-21). Chinese imports of TiO₂ into North America are still “a relatively small portion of total exports from China.” (Shehadeh, Tr. 3224-26). This means there is greater “potential that’s out there for that substitution by North American customers to alternative sources of supply.” (Shehadeh, Tr. 3224-26). These alternative sources of supply for TiO₂ are relevant for North American customers who would be seeking “other sources in response to [a] SSNIP” in North America. (Shehadeh, Tr. 3224-26).

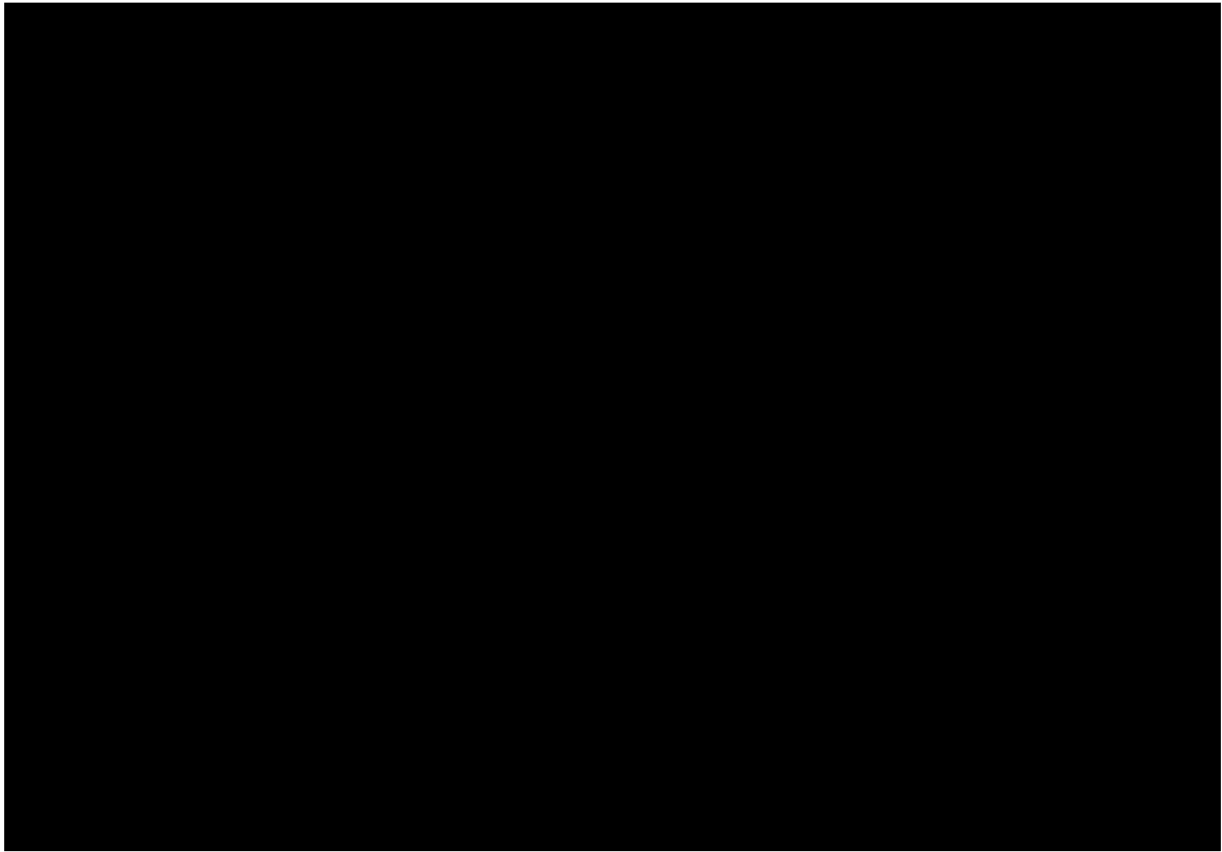
Response to Proposed Finding No. 300

The Proposed Finding is vague, misleading and contrary to the weight of the evidence. First of all, within Dr. Hill’s market definition analysis, consistent with the Horizontal Merger Guidelines, imports are properly considered part of the hypothetical monopolist. (CCFF ¶¶ 360-62; *see also* PX9085 at 017-18 (Horizontal Merger Guidelines, § 4.2.2)). Because the Horizontal Merger Guidelines follow the demand-centric approach for the market definition analysis, it is improper to consider supply-side responses, such as import response, while determining the scope of a relevant market. (CCFF ¶ 362; PX9085 at 007 (Horizontal Merger Guidelines, § 4); *see also* PX5004 at 034 (¶¶ 77-79) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

The Proposed Finding is vague and misleading in that Respondents cite to Dr. Shehadeh for the proposition that imports of Chinese TiO₂ increased by five times from 2010 to 2016, and

his estimates includes chloride and sulfate (including anatase) TiO₂. The Proposed Finding is also misleading in that imports over the entire period were relatively small, but there was one year, 2016, where exports of TiO₂ from China were at a somewhat higher level compared to the previous five years, albeit still a relatively low level. (RX1198 at 0072 (TZMI Presentation)). Further, Dr. Shehadeh failed to take into account information available to him. First, as Dr. Hill described, those imports from China largely displaced other imported sulfate TiO₂. (PX5000 at 036 (Fig. 14) (Hill Initial Report) (*in camera*)). Second, imports of Chinese manufactured TiO₂ have also declined substantially from 2016, when he cut off his observation, into 2017. (CCFF ¶ 786). Additionally, in offering his opinion regarding the theoretical “potential” for increased supply from China, Dr. Shehadeh did not address evidence such as the conclusion from the head of Venator’s TiO₂ business that Venator does not “go head to head” with Chinese TiO₂ in North America. (PX7015 (Maiter, Dep. at 204) (“We do not go head-to-head with [Chinese] producers in those two markets, in Europe and North America.”)). Nor did he apparently consider the extensive customer testimony rejecting theoretical increased supply from Chinese produces as a substitute for chloride TiO₂ in North America. (CCFF ¶¶ 745-812). Finally, in offering his opinion about this theoretical potential for increased supply by Chinese producers of TiO₂, Dr. Shehadeh did not consider the contradictory public disclosures of Tronox that “the kind of customers that will buy our high-quality pigments are not simultaneously looking at for the same supply need Chinese product.” (PX9006 at 006 (Tronox Q2 2015 Earnings Call); CCFF ¶¶ 745, 396).

301. The “significant volume of imports and the flexibility and elasticity in imports” observed at the global level can also be observed at the “individual company level.” (Shehadeh, Tr. 3226-27). [REDACTED]



Response to Proposed Finding No. 301

The Proposed Finding is vague, misleading, and contrary to the weight of the evidence. First, although the table purports to describe Venator's rutile TiO₂ imports, Dr. Shehadeh does not explain how he worked through the Venator information to ensure that the volumes described in Shehadeh Figure 46 do not include specialty sulfate grades, including the anatase grades that Venator produces at plants such as Pori, Finland and Duisburg, Germany. (PX7015 (Maiter, Dep. at 115) (*in camera*)). About two-thirds of Venator's total shipments to North America are these specialty grades. (PX8005 at 004 (¶ 19) (Maiter Decl.)). In addition, Shehadeh Figure 46 includes a significant volume of "Unknown Origin," which on its face is unreliable. In fact, Dr. Shehadeh described in a footnote to his report that the volume of unknown origin may be imported TiO₂ or domestically produced TiO₂ (with the bold line representing a low estimate of overseas produced TiO₂, and the dotted line representing a high estimate). (RX0170 at 0094 (Fig. 46) (Shehadeh

expert report) (*in camera*)). Further, Dr. Shehadeh may have made errors in applying the Venator data. For example, in 2016, the Proposed Finding shows that he reported in Figure 46, [REDACTED]

[REDACTED] As Dr. Shehadeh described in his report, the information he considered included [REDACTED]

[REDACTED], suggesting that his representations in Figure 46 are inaccurate.

Second, Shehadeh Figure 46 shows that, for the known volumes, Venator primarily imports sulfate TiO₂, not chloride TiO₂, because Venator produces chloride TiO₂ only in Louisiana, USA and Greatham, UK. (PX8005 at 002 (¶ 11) (Maiter Decl.)). Third, Shehadeh Figure 46 is not a representative example of supplier import activity in North America, as it shows only Venator's import activities, but not any other suppliers. Due the cost disadvantage of shipping TiO₂ into North America, Venator imports into North America tend to be specialty or high-performance grades that can partly overcome the additional duty, shipping, and storage costs. (PX8005 at 004 (¶ 19) (Maiter Decl.); CCF ¶ 647). [REDACTED]

[REDACTED] (PX7015 (Maiter, Dep. at 135) (*in camera*)). Indeed, Venator's own internal documents projected for 2017 that imported TiO₂ sales for use by the company's White Pigments business (applications other than specialties) [REDACTED] [REDACTED], (PX3025 at 011 (White Pigments Sales Analysis) (*in camera*)), compared to the much larger number in Dr. Shehadeh's table, and this difference likely reflects his inclusion of the specialty volumes, and the effect of the volumes of unknown origin.

Dr. Shehadeh did not create any similar charts for Tronox, Cristal, and Chemours, because rather than importing chloride TiO₂ into North America, those firms export chloride TiO₂ from North America. (PX5000 at 039 (Fig. 16) (Hill Initial Report) (*in camera*)). The other major European supplier, Kronos, { [REDACTED] } (CCFF ¶¶ 647-48).

Finally, the Proposed Finding is vague, because it does not explain what “flexibility and elasticity in imports” or a “significant share” means. Rather, the data shows that imports of chloride TiO₂ into North America accounted for { [REDACTED] } of sales. (CCFF ¶ 141).

302. [REDACTED]

Response to Proposed Finding No. 302

The Proposed Finding is misleading, vague, and contrary to the weight of the evidence, and is unsupported in parts by the citation. First of all, within Dr. Hill’s market definition analysis, consistent with the Horizontal Merger Guidelines, imports are properly considered part of the hypothetical monopolist. (CCFF ¶¶ 360-62; *see also* PX9085 at 017-18 (Horizontal Merger Guidelines, § 4.2.2)). Because the Horizontal Merger Guidelines follow the demand-centric approach for the market definition analysis, it is improper to consider supply-side responses, such

as import response, while determining the scope of a relevant market. (CCFF ¶ 362; PX9085 at 007 (Horizontal Merger Guidelines, § 4); *see also* PX5004 at 034 (¶¶ 77-79) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

Further, Shehadeh Figure 46 is vague, misleading and incomplete for the reasons set forth in CCRRFF ¶ 301. The reference to “the increase in imports over time” is particularly unreliable because a major portion of the increase can be attributed to the larger number for volumes of unknown origin in 2016, which can be given no weight as evidence of anything, as well as his apparent mistakes in not accounting for grades imported from the Pori, Finland plant prior to 2016.

Moreover, the Proposed Finding includes a number of statements that are vague and undefined, including “elasticity of global trade” and “flexibility of import supply.”

303. In terms of exports, North America is a net exporter of rutile TiO₂ and chloride-process TiO₂. (Hill, Tr. 1901-02). Indeed, “a significant amount of chloride titanium dioxide produced in North America is exported.” (Hill, Tr. 1901).

Response to Proposed Finding No. 303

Complaint Counsel has no specific response.

304. Between 2002 and 2016, North American exports of chloride-process TiO₂ ranged from just over 400,000 metric tons per year to almost 700,000 metric tons per year. (Hill, Tr. 1902; PX5000-038, Fig. 15). In 2016, over 600,000 metric tons of chloride titanium dioxide—46 percent of all chloride titanium dioxide produced in North America—was exported out of North America. (Hill, Tr. 1902; PX5000-037 ¶ 84). Chemours alone exports roughly 400,000 tons of chloride TiO₂ from North America each year. (Hill, Tr. 1902; 1935).

Response to Proposed Finding No. 304

Complaint Counsel has no specific response.

305. “The significant trade flows lead to the linkage of demand in North America to supply around the world and reflect the ability of customers in North America to turn to international supply, including in response to a small but significant nontransitory increase in price in the candidate market, North America.” (Shehadeh, Tr. 3229). For geographic market definition and the hypothetical monopolist test, this means “that the market related to North America would be drawn too narrowly and needs to be expanded to be global.” (Shehadeh, Tr. 3229).

Response to Proposed Finding No. 305

The Proposed Finding is inaccurate, misleading, vague, and contrary to the weight of the evidence. The overwhelming evidence in the record—including extensive testimony of customers regarding their reliance on North American producers of chloride TiO₂, (CCFF ¶¶ 261-98), the evidence of regional pricing decisions by TiO₂ producers, (CCFF ¶¶ 151-59, 199-225), and the substantial evidence of persistent price differences that have existed between North America and other regions of the world, (CCFF ¶¶ 232-58)—establishes that customers in North America cannot readily turn to “international supply,” which is a particularly vague phrase and not defined anywhere, in response to a North American SSNIP.

Further, Dr. Shehadeh has misapplied the hypothetical monopolist test, by looking at supplier movement of all TiO₂ in the application of the hypothetical monopolist test, which looks solely at demand substitution factors. (CCFF ¶ 360; *see* CCRRFF ¶ 349, above). Thus, the question is not whether suppliers have moved product, but whether customers would arbitrage chloride TiO₂ to avoid a SSNIP; Dr. Shehadeh erred by including this potential supply response as an element of market definition. (CCFF ¶¶ 360–62). By shoehorning “import supply” response into market definition, Dr. Shehadeh makes a mistake that was previously rejected in another merger case where his opinion was not credited. (*United States v. Bazaarvoice*, No. 13-00133, 2014 U.S. Dist. LEXIS 3284 (N.D. Cal. Jan. 8, 2014); Shehadeh, Tr. 3556-58).

Finally, Dr. Shehadeh’s vague reference to a “linkage” is contradicted by the overwhelming evidence in the record. (CCFF ¶¶ 134-322).

B. TiO₂ Prices Rise and Fall Together Across Geographic Regions, Demonstrating that the Market for TiO₂ Is Global.

306. The “statistically and economically significant” “co-movement” of TiO₂ prices across geographic regions is a well-established economic method that “demonstrate[s] that the relevant market is broader than North America” and, in fact, is global. (Shehadeh, Tr. 3230). Co-movement means TiO₂ prices across different regions “mov[e] together over time.” (Shehadeh,

Tr. 3230). Specifically, “when price goes up, it goes up everywhere in the world, and when price goes down, it goes down everywhere in the world.” (Turgeon, Tr. 2672).

Response to Proposed Finding No. 306

The Proposed Finding is misleading and contrary to the weight of the evidence. There is not a statistically significant comovement of prices across geographic regions, as Dr. Shehadeh had, at most, only 24 observations for which to observe comovement or cointegration, when even 100 observations is not sufficient for the same cointegration analysis employed by Dr. Shehadeh. (Shehadeh, Tr. 3608-09). Indeed, testimony from Respondents’ own employees contradict the conclusions of Dr. Shehadeh and the testimony of Mr. Turgeon. (CCFF ¶ 151 (Mouland, Tr. 1255 (*in camera*) ([REDACTED] [REDACTED])); CCFF ¶ 225 (PX2252 at 040 (*In Re: Titanium Dioxide Antitrust Litigation*, Deposition Transcript of Jerry Bassett) ([REDACTED] [REDACTED] [REDACTED] [REDACTED])) (*in camera*)). The Proposed Finding is also contrary to the substantial amount of evidence from Tronox’s own ordinary course documents of regional pricing for TiO₂, (CCFF ¶¶ 151-59, 199-225), and of sustained differences in TiO₂ pricing between North America and other regions. (CCFF ¶¶ 232-58). Moreover, price comovement is not a “well established economic method,” as described in CCRRFF ¶ 309.

307. The co-movement of prices involves “look[ing] at the closeness of relationships between geographies, whether or not there is a long-term relationship.” (Shehadeh, Tr. 3230). The statistical analysis of this co-movement of prices “account[s] for other factors” in determining the co-movement of prices beside being in the same geographic market. (Shehadeh, Tr. 3229-30).

Response to Proposed Finding No. 307

The Proposed Finding is misleading and does not refute the conclusion of the hypothetical monopolist test. The deficiencies in Dr. Shehadeh's price comovement test are detailed in CCRRFF ¶¶ 306 and 309. Moreover, Dr. Shehadeh did not "account for other factors" besides geography in determining comovement of price; he accounted only for costs and seasonality, but not for common demand shocks. (CCFF ¶ 356).

308. The statistically and economically significant global co-movement of TiO₂ prices "inform[s] the scope of the relevant market, and particularly, here, demonstrate[s] that the relevant market is broader than North America." (Shehadeh, Tr. 3229-30).

Response to Proposed Finding No. 308

The Proposed Finding is misleading and inaccurate because as described in CCRRFF ¶ 306, Dr. Shehadeh did not show a statistically significant comovement of prices across geographic regions. In addition, it is misleading and inaccurate for the reasons set forth in CCRRFF ¶ 309, because price comovement is not an accepted method of defining a relevant market, nor does it rebut the conclusion of the hypothetical monopolist test.

Further, the Proposed Finding is contrary to the overwhelming weight of the evidence that the relevant market is the sale of chloride TiO₂ in North America, including extensive testimony of customers regarding their reliance on North American producers of chloride TiO₂, (CCFF ¶¶ 261-98), the evidence of regional pricing decisions by TiO₂ producers, (CCFF ¶¶ 151-59, 199-225), and the substantial evidence of persistent price differences that have existed between North America and other regions of the world, (CCFF ¶¶ 232-58).

309. The methods used by Dr. Shehadeh to evaluate the co-movement of TiO₂ prices, both economically and statistically, are "generally accepted economic methods" in the field. (Shehadeh, Tr. 3229-30). Indeed, these methods for evaluating co-movement of prices for determining relevant markets have "been used by economists" and "published in academic journals, including publications by economists at the Federal Trade Commission." (Shehadeh, Tr. 3229-30). The economic literature Dr. Shehadeh relies upon is "peer-reviewed." (Shehadeh, Tr. 3231-32).

Response to Proposed Finding No. 309

The Proposed Finding is misleading and inaccurate. Comovement of prices are neither “used by economists” at the Federal Trade Commission nor the “generally accepted economic methods” used in defining relevant antitrust markets. The paper that Dr. Shehadeh cites to in support of this assertion is from 1993, and Dr. Shehadeh could not cite any academic literature since 1993 that supports the use of price comovement to define relevant markets. (Shehadeh, Tr. 3597-98). Moreover, Dr. Shehadeh had, at most, only 24 observations for which to observe comovement or cointegration, when even 100 observations is not sufficient for the same cointegration analysis employed by Dr. Shehadeh. (Shehadeh, Tr. 3608-09). Indeed, the same cointegration analysis performed by Dr. Shehadeh shows that propane and crude oil are in the same product market, but that plainly is incorrect. (CCFF ¶ 359).

310. To evaluate the statistical and economic co-movement of TiO₂ prices across geographic regions, Dr. Shehadeh “looked at pricing data from companies produced in this litigation, as well as pricing data from industry analysts, TZMI.” (Shehadeh, Tr. 3230-31). Based on this data, the evidence shows that “prices over time, across geographies,” “establish the relationship between North America and the rest of the world.” (Shehadeh, Tr. 3232). This shows that “[t]he geographic market is global.” (Shehadeh, Tr. 3233).

Response to Proposed Finding No. 310

The Proposed Finding is misleading and inaccurate for the reasons set forth in CCRRFF ¶ 309, because price comovement is not an accepted method of defining a relevant market, nor does it rebut the conclusion of the hypothetical monopolist test.

Further, the conclusion of the Proposed Finding is contradicted by substantial evidence in the record that TiO₂ is priced on a regional basis, (CCFF ¶¶ 151-59, 199-225), and the evidence of sustained pricing differences over time between North America and other regions. (CCFF ¶¶ 232-58).

311. [REDACTED]

[REDACTED]

Response to Proposed Finding No. 311

Complaint Counsel has no specific response.

312. [REDACTED]

Response to Proposed Finding No. 312

The Proposed Finding is misleading and incomplete. As Dr. Hill explained in his expert report and during trial testimony, the possible comovement of prices do not determine the boundaries of the relevant antitrust market. (CCFF ¶¶ 353-59). On the contrary, correlation analysis used by Dr. Shehadeh is prone to false positives that stem from common demand or supply

factors and thus is not appropriate for defining relevant antitrust markets. (CCFF ¶ 355; PX5004 at 022-23 (¶¶ 47-50) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

313. [REDACTED]

“[A]nytime . . . the TiO₂ pricing moves outside of that band, it [tends] to migrate back into the band over time.” (Romano, Tr. 2233). [REDACTED]

[REDACTED] If one region were to fall outside of that trend, it would open up arbitrage opportunities. (Stern, Tr. 3719). [REDACTED]

[REDACTED] The same factors influence prices across the globe, so in that sense prices for TiO₂ are “interdependent” of one another in different parts of the world. (Romano, Tr. 2237).

Response to Proposed Finding No. 313

The Proposed Finding is vague, factually inaccurate and contrary to the weight of the evidence. For example, as Dr. Hill showed after conducting quantitative analysis of invoice data from Tronox and Cristal, North American customers consistently paid { [REDACTED] } for products made at Respondents’ North American factories. (CCFF ¶ 236; *see also* CCFF ¶ 240 (citing Mr. Romano’s testimony acknowledging that { [REDACTED] })); Romano, Tr. 2177 (*in camera*); PX1349 at 009 (Tronox Presentation) (*in camera*)).

The first sentence of the Proposed Finding is not supported by the citation, i.e., there is no testimony referencing or supporting the proposition in the first sentence of the Proposed Finding in the cited pages of the transcript (Romano, Tr. 2155-56 (*in camera*)). In addition, the fourth sentence of this Proposed Finding (“This is because of . . .”) is incomplete and misleading. The cited answer was provided in response to Complaint Counsel’s following question: { [REDACTED] }

[REDACTED]

[REDACTED]

[REDACTED] } (Romano, Tr. 2155 (emphasis added) (*in camera*)).

Propositions included in this Proposed Finding are also vague as to the terms “sometimes,” “relatively,” “typically,” “tends to,” “over time,” and “normally” and just cite the testimony of one Tronox executive (Mr. Romano) and Mr. Stern without citing any supporting documents or data. In contrast to these vague assertion, the overwhelming evidence that is in the record establishes that TiO₂ pricing is established on a regional basis, (CCFF ¶¶ 151-59, 199-225), and that pricing in North America has for several years been sustained at a higher level than other regions. (CCFF ¶¶ 232-58).

314. [REDACTED]

Response to Proposed Finding No. 314

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. In his expert report, Dr. Hill reported the quantitative results from conducting additional price regressions that “control for a wide range of variables, including differences in customer and grade” and still concluded that { [REDACTED] } (CCFF ¶¶ 163, 238; PX5004 at 073 (¶¶ 173-74, 176) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

315. [REDACTED]



Response to Proposed Finding No. 315

Complaint Counsel has no specific response.

316. 

Response to Proposed Finding No. 316

The Proposed Finding is misleading in that it only accounts for “the individual customer” but nothing about this Figure 74 accounts for “grade level.” Dr. Shehadeh’s expert report confirms that limitation as well (RX0170 at 0136 (¶ 241) (Shehadeh expert report) (“this figure [Figure 74] accounts for just one compositional issue—differences in customers across regions”) (*in camera*)).

Because Figure 74 does not provide any explanation with respect to “accounting for ... grade,” any reference to “grade level” or “grade[s]” in the Proposed Finding No. 316 should be disregarded as unsupported by the cited evidence.

Even with respect to “accounting for [the] individual customer”—{ [REDACTED] }—the Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The record is clear that even after accounting for an individual customer, there exists significant and persistent differences in prices paid by the customer across different regions. (CCFF ¶¶ 172-73, 175-76, 179, 186, 191-92, 234-38). Moreover, Figure 14 in Dr. Hill’s expert rebuttal report, which contains the same price series for { [REDACTED] } used in Shehadeh Figure 74, but focuses on two lines out of six plotted in Shehadeh Figure 74, shows that { [REDACTED] } [REDACTED] } (PX5004 at 036-37 (¶ 84 & Fig. 14) (Hill Rebuttal Report to Shehadeh) (*in camera*)).



317. The data on TiO₂ pricing across geographic regions “consistently show[s] that the co-movement in prices is statistically and economically significant across a variety of statistical tools, including correlations and cointegration.” (Shehadeh, Tr. 3231). FTC economists describe the methods used by Dr. Shehadeh for evaluating co-movement in TiO₂ prices across regions and product types as “among the broadly applied techniques” for defining antitrust markets; this is true for both geographic and product markets. (Shehadeh, Tr. 3233-38). Indeed, the data on co-movement of TiO₂ prices globally “fits squarely into the fabric of economic evidence that is called for in the Merger Guidelines when describing the hypothetical monopolist test and consistent with the economics literature.”²⁹ (Shehadeh, Tr. 3243-44).

Response to Proposed Finding No. 317

The Proposed Finding is factually inaccurate, misleading, incomplete, and contrary to the weight of the evidence for the reasons laid out in response to Proposed Finding No. 270, 306, and 309. Again, evaluating “co-movement in prices” is an ill-suited method to define a relevant antitrust market and is not “among the broadly applied techniques” for defining antitrust markets and not used by FTC economists to define antitrust markets. (CCRRFF ¶¶ 270, 306, and 309; CCFE ¶¶ 353-59).

The last sentence in the Proposed Finding 317 should be disregarded and should not be relied upon because as Complaint Counsel objected during the trial, this testimony by Dr. Shehadeh is not included in his expert report and he was offering a new opinion outside the scope of his report. (Shehadeh, Tr. 3243-55). Footnote 29 to the Proposed Finding is also incomplete and misleading as the following exchange shows that Complaint Counsel objected to Dr. Shehadeh’s testimony because it was “outside the scope of his report” and Judge Chappell allowed Complaint Counsel’s standing objection to that effect:

²⁹ At trial, Complaint Counsel objected to Dr. Shehadeh, an economist, testifying about the DOJ/FTC Merger Guidelines in a merger case. (Shehadeh, Tr. 3245-46).

JUDGE CHAPPELL: Well, when that thing that goes around comes around and when all is said and done and the record's in front of us, if it's demonstrated in any expert in this trial -- because everybody here knows the rules. I lay them out ahead of time.

If there is expert testimony that's not in the expert report and that's pointed out in post-trial briefing, it will not be relied upon to make a decision in this case. That's my ruling.

MR. PRUITT: Absolutely, Your Honor. Understood.

JUDGE CHAPPELL: So to move along, I'm allowing this for now. You may inquire into this on cross. You may press it in post-trial briefing, if necessary.

MR. LOUGHLIN: Can I also have a standing objection on this, Your Honor, so I don't have to continue to interrupt the proceedings?

JUDGE CHAPPELL: If you want to have a standing objection, you need to state exactly what that objection is.

MR. LOUGHLIN: My standing objection is to his discussion of Section 4.1.3 that I believe is outside the scope of his report.

JUDGE CHAPPELL: All right. That's allowed.

(Shehadeh, Tr. 3254-55).

318. Stern Figure 26 (RX0171.0072) shows "the extent to which there have been price changes for TiO₂ for various regions," including the United States, Europe, and Asia between 2000 and 2017. (Stern, Tr. 3720).

Figure 26²²⁶
Year-over-Year TiO₂ Price Changes (%)



Response to Proposed Finding No. 318

The Proposed Finding should be disregarded by the Court because the assertion that this Figure 26, which Mr. Stern copied from a Jefferies equity research report and pasted into his expert report (RX0171), shows “the extent to which there have been price changes for TiO₂ for various regions” is a factual proposition that should be established by fact witnesses or documents, not through expert testimony at the trial. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794).

Moreover, the Proposed Finding is misleading and incomplete because the way the long data series from 2000 to 2017 was portrayed in the figure obscures the significant differences between the three lines. For example, at one point between January 2012 and January 2013, the year-over-year TiO₂ price change in the United States was as high as 20%, but the year-over-year TiO₂ price change in the EU appears to be less than half of that and the year-over-year TiO₂ price change in Asia was actually in the negative territory. Further, the Proposed Finding is also misleading because the “TiO₂ Price” depicted in the figure seems to include the price of sulfate anatase TiO₂, which is not part of the relevant markets alleged by Complaint Counsel or the market proposed by Respondents.

319. Stern Figure 26 (RX0171.0072) shows that prices changes “year by year have tracked each other quite well.” (Stern, Tr. 3720). “The shape of the curves is nearly identical.” (Stern, Tr. 3720).

Response to Proposed Finding No. 319

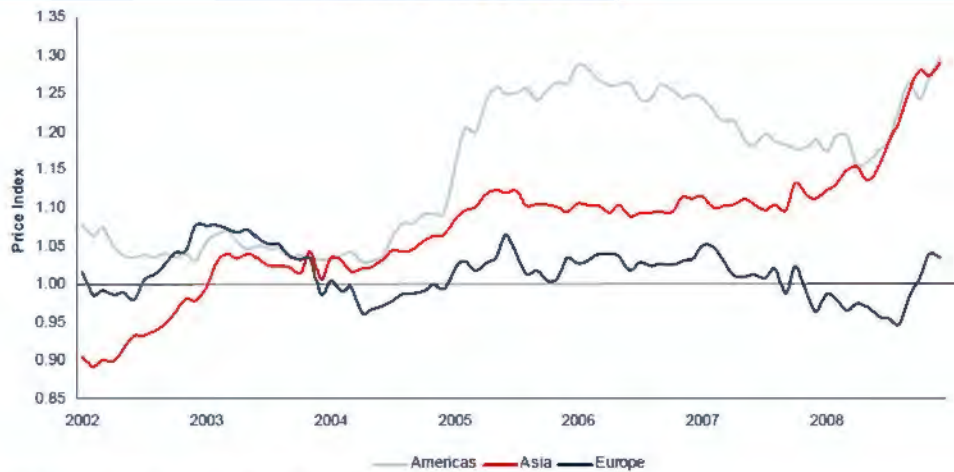
The Proposed Finding should be disregarded by the Court because the assertion that this Figure 26, which Mr. Stern copied from a Jeffries equity research report and pasted into his expert report (RX0171), shows “that prices changes ‘year by year have tracked each other quite well.’” is a factual proposition that should be established by fact witnesses or documents, not through expert testimony at the trial. (*See* June 27, 2018 Order on Post-Trial Briefs; Tr. 3794).

Further, the Proposed Finding is factually inaccurate and misleading for the reason described in Response to Proposed Finding No. 318. Moreover, examining the “Year-over-Year TiO₂ Price Changes (%)” instead of the actual price levels in each region is incomplete and misleading because it does not provide the complete picture of the price changes in each region. For example, Tronox’s own Confidential Information Memorandum included the following figure that shows the significant and persistent differences in TiO₂ prices (and divergent movements) across three regions between 2002 and 2009. (PX1001 at 069 (Tronox Presentation); *see also* CCF ¶ 159).

TRONOX TiO₂ Pricing Company Overview – TiO₂ Pricing

- In 2008, manufacturers were able to adjust prices to recover some of their cost increases
- In 2009, demand weakness has caused some downward pressure on prices, however prices are expected to rebound in 2010 as end markets begin to recover

Historical Price Index for TiO₂



Source: Management estimate (indexed to January 2002 average price across regions)

STRICTLY PRIVATE AND CONFIDENTIAL

CONFIDENTIAL INFORMATION MEMORANDUM

68

320.

[REDACTED]

Response to Proposed Finding No. 320

The Proposed Finding is misleading and incomplete in that it does not supply the full context of Dr. Hill’s trial testimony provided regarding pricing. The Proposed Finding states that

Dr. Hill { [REDACTED] }, but Dr. Hill’s actual testimony

[REDACTED]

explains that { [REDACTED] }.

{ [REDACTED] }. (Hill, Tr. 2045-46 (*in camera*)). Dr. Hill also further discussed { [REDACTED] }.

{ [REDACTED] }.

{ [REDACTED] }.

{ [REDACTED] }. (Hill, Tr. 2050 (*in camera*)). Relying on documents and economic analysis, Dr. Hill explains that { [REDACTED] }.

{ [REDACTED] }.

{ [REDACTED] }. (PX5004 at 039-40 (¶¶ 88-92 & Figs. 17, 18) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

In addition, Respondents' reliance on the generalized notion that prices may be "rising" or "falling" in different regions at the same time highlights the degree to which in their analysis Respondents have made no effort to separate common cost or demand factors that can have similar effects on pricing in different regions. At the same time that they set aside these important factors, Respondents have ignored virtually all of the ordinary course real world evidence that prices for chloride TiO₂ are established on a regional basis. (CCFF ¶¶ 148-64, 199-225).

321. The Pori fire in Europe is an example of a regional event affecting global supply-demand balance. (Stern, Tr. 3717-18).

{ [REDACTED] } Supplies from other regions needed to pour in to replace the lost supply. (Stern, Tr. 3717-3718). In fact, after the Pori fire, Europe, which "used to be one of the lowest area price[s] in the world suddenly switched to become the highest price," and producers responded by "start[ing] to move their production to feed that market." (Turgeon, Tr. 2668).

Response to Proposed Finding No. 321

Part of Proposed Finding No. 321 is not supported by the evidence cited. The Court sustained an objection to the cited testimony of Mr. Turgeon, so the cited testimony is not part of the administrative record and cannot be relied upon for this Proposed Finding. (Tr. 2669 ("The

part of the answer beginning with “Because, as a publicly listed company,” that part will not be considered. That part of your objection is sustained. If it’s a motion to strike, it’s granted from that point on.”). The Proposed Finding is also incomplete and misleading as it discusses the purported supply responses after the Pori fire without citing any record evidence except Mr. Stern’s unfounded testimony not based on any independent analysis. Relying on documents and economic analysis, Dr. Hill demonstrated, { [REDACTED] } (PX5004 at 039-40 (¶¶ 88-92 & Figs. 17, 18) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

322. Even though the Pori plant is located in Finland and makes TiO₂ using only the sulfate process—it does not use the chloride method—the fire affected TiO₂ prices worldwide, including in North America. (Stern, Tr. 3718; [REDACTED] In the short-term, TiO₂ prices globally went up. (Stern, Tr. 3718).

Response to Proposed Finding No. 322

The Proposed Finding is misleading and incomplete. The Proposed Finding is incomplete because while TiO₂ prices did go up in North America and abroad in the short-term following the Pori plant fire, the price went up more in Europe, where the plant is located, than in North America, suggesting that there are differences in the market between those two regions. (Hill, Tr. 2050 ([REDACTED] } (*in camera*); PX5004 at 039-40 (¶¶ 90-91 & Fig. 17) (Hill Rebuttal Report to Shehadeh); *see also* CCF ¶¶ 633-34)). This is not consistent with a global TiO₂ market, but instead is consistent with Dr. Hill’s conclusion that { [REDACTED] } (PX5004 at 039-40 (¶¶ 88-92 & Figs. 17, 18) (Hill Rebuttal Report to Shehadeh)

(*in camera*)). The Proposed Finding is not supported by the evidence cited in that it relies upon Dr. Shehadeh's testimony regarding facts, and is contrary to the weight of the evidence. The record evidence shows that, in fact, the Pori fire does not establish the market as Dr. Shehadeh alleges. For example, a Tronox salesperson admitted to a customer that { [REDACTED] [REDACTED] [REDACTED] } (PX4181 at 014 (Doherty email) (*in camera*)). Lastly, comovement is ill-suited for antitrust analysis for the reasons explained in CCRRFF ¶ 419, below. (*See also* CCFF ¶¶ 270, 306, 309).

323. [REDACTED]

Response to Proposed Finding No. 323

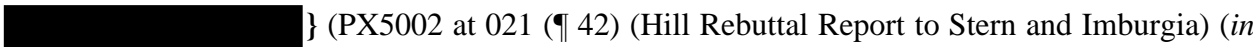
The Proposed Finding is misleading and incomplete for the reasons covered in CCRRFF ¶ 322.

324. [REDACTED]



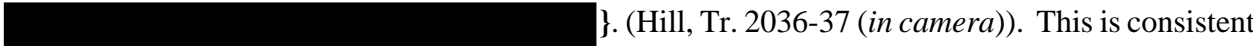
Response to Proposed Finding No. 324

The Proposed Finding misleading and incomplete. First, {



} (PX5002 at 021 (¶ 42) (Hill Rebuttal Report to Stern and Imburgia) (*in*

camera)). Second, Dr. Hill explained that {



}. (Hill, Tr. 2036-37 (*in camera*)). This is consistent

with, and indeed supports, Dr. Hill’s conclusion that {



}. (PX5002 at 017-21 (¶¶ 34-45 & Figs. 5-7) (Hill

Rebuttal Report to Stern and Imburgia) (*in camera*)). TiO2 prices increasing in response to the

Pori plant fire is not disprove that {



}. (PX5002 at 009 (¶ 10) (Hill Rebuttal Report to Stern and Imburgia) (*in*

camera)).

325. The global co-movement of TiO2 prices, as informed by well-accepted, peer-reviewed economic literature by FTC economists, “demonstrate[s] the interrelationship of titanium dioxide globally” and, in particular, “that a market limited to North America is drawn too narrowly and that, in contrast, the properly defined relevant market is global.” (Shehadeh, Tr. 3231).

Response to Proposed Finding No. 325

The Proposed Finding is misleading and not relevant in that correlation and cointegration analyses are not appropriate antitrust tools to determine product market. (PX9085 at 011-12 (Horizontal Merger Guidelines § 4.1.1); Hill, Tr. 1732 (*in camera*); *see also* CCRRFF ¶ 419, below). A market limited to North America is consistent the application of the hypothetical monopolist test, which indicates that demand for chloride TiO₂ is strong in North America and that, in the face of a SSNIP, Norther American customers are unlikely to switch away from North American chloride TiO₂ suppliers. (CCFF ¶¶ 323-329). The Proposed Finding is not supported by the evidence cited, as Dr. Shehadeh does not indicate in the cited testimony that he used “well-accepted, peer-reviewed economic literature by FTC economists” to evaluate whether there is a global movement of TiO₂ prices.

C. TiO₂ Producers and Customers Can and Do Engage in Arbitrage.

326. Both suppliers and customers of TiO₂ “engage[] in arbitrage.” (Romano, Tr. 2237-38). In particular, customers of TiO₂ “have the capability to” move TiO₂ “all over the world.” (Romano, Tr. 2237). Customers have the ability to engage in arbitrage of TiO₂, so if price reaches levels “where it’s significantly higher for a significant period of time, customers will move product around.” (Romano, Tr. 2237-38). This is arbitrage. (Romano, Tr. 2237). For the most part, “those are global customers.” (Romano, Tr. 2237-38). [REDACTED]

Response to Proposed Finding No. 326

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. Customers universally testified that they do not engage in arbitrage of chloride TiO₂ in North America. (CCFF ¶¶ 272-77). Specifically, as Mr. Malichky, who has been employed by PPG for about ten years and for the last five years, served as PPG’s Director of Raw Material Sourcing,

³¹ PPG Industries is one of the largest paint and coatings companies in the world. (Malichky, Tr. 267-69, 343). In the United States, PPG sells architectural paint under the brand names Glidden, Pittsburgh Paint, Manor Hall, Liquid Nails, and others. (Malichky, Tr. 269). PPG also sells paint for industrial applications, like bridges, cars, and airplanes. (Malichky, Tr. 269-70).

directly responsible for negotiating the purchase of approximately { [REDACTED] } of TiO2 for use in the United States and Canada and also responsible for purchasing TiO2 in other regions (PX8000 at 001 (¶¶ 2-3) (Malichky Decl.) (partially *in camera*); Malichky, Tr. 270), testified at trial, { [REDACTED] }
[REDACTED]
[REDACTED]
[REDACTED]}. (Malichky, Tr. 314 (*in camera*)).

Mr. Arrowood of Deceuninck North America (DNA) testified at trial that DNA does not even consider purchasing TiO2 from outside of North America because of the problems that can occur with transportation and long lead times. (Arrowood, Tr. 1084). The testimony of customers should be preferred over the testimony of Mr. Romano because customers know better than Tronox executives whether arbitrage has actually occurred at their companies. The weight of the evidence makes it clear that North American TiO2 customers would not be able to defeat a small, but significant North American chloride TiO2 price increase through arbitrage. (CCFF ¶¶ 283-89). TiO2 suppliers recognize the cost of transporting TiO2 across regions, which greatly affects the ability of customers to arbitrage in the face of a small, but significant price increase. (PX1372 at 020 (Tronox May 2014 email with strategic plan presentation attached) ({ [REDACTED] }
[REDACTED]
[REDACTED] } (in camera)).

327. [REDACTED]

Response to Proposed Finding No. 327

The Proposed Finding is misleading, incomplete and not supported by the evidence cited.

First, PPG testified that { [REDACTED] }
[REDACTED]}. (Malichky, Tr. 314 (*in camera*); Malichky, Tr. 378 ({ [REDACTED] }
[REDACTED]
[REDACTED]
[REDACTED] } (*in camera*)). PPG { [REDACTED] }
[REDACTED]
[REDACTED] }. (Malichky, Tr.
387 (*in camera*)).

328. [REDACTED]

Response to Proposed Finding No. 328

The Proposed Finding is misleading and incomplete. Some North American TiO2 customers, such as Sherwin-Williams, { [REDACTED] }
[REDACTED]
[REDACTED]
[REDACTED] } (Young, Tr. 674-735 (*in camera*)). TiO2 suppliers also recognize the cost of transporting TiO2 across regions, which greatly affects the ability of customers to arbitrage in the face of a small, but significant price increase. (PX1372 at 020 (Tronox May 2014 email with strategic plan presentation attached) ({ [REDACTED] }
[REDACTED]
[REDACTED] } (*in camera*)).

The cite to [REDACTED] is overstated and misleading. When Sherwin-Williams acquired Valspar, { [REDACTED] [REDACTED] [REDACTED] } (Young, Tr. 704, 735 (*in camera*)).

329. Although customers will engage in arbitrage when opportunities exist, in practice there are few opportunities for arbitrage because prices “all follow the same sort of trend globally.” (Stern, Tr. 3719; [REDACTED] [REDACTED] As a result, “[y]ou won’t find one region seriously out of whack with another region. That would open up arbitrage opportunities.” (Stern, Tr. 3719).

Response to Proposed Finding No. 329

The Proposed Finding is not supported by the evidence cited. First, Mr. Stern has no experience or expertise in the TiO2 industry and therefore no basis for his statement that arbitraging among customers is low because prices follow global pricing trends. (Stern, Tr. 3855-3859). Second, while Mr. Malichky did describe { [REDACTED] }, the cited testimony does not support the assertion that there are few opportunities for arbitrage “because prices ‘all follow the same sort of trend globally.’” { [REDACTED] [REDACTED] } (Malichky, Tr. 388-89 (*in camera*)). The Proposed Finding is also factually inaccurate and contrary to the weight of the evidence. There are few opportunities for arbitrage because it is expensive and impractical. (CCFF ¶¶ 272-77, 283-89). Dr. Hill’s review of the documents and testimony, as well as economic analysis, show that regional price differences persist for significant periods. (PX5000 at 060-63 (¶¶ 138-43) (Hill Initial Report) (*in camera*)). Even so, { [REDACTED] }

[REDACTED] } (PX5000 at 063-67 (¶¶ 144-51) (Hill Initial Report) (*in camera*)). The Proposed Finding is also vague, as nowhere in the cited testimony does Mr. Stern give a definition of what it would mean for one region's TiO₂ pricing to be "seriously out of whack" with another. Through his review of documents and testimony, as well as economic analysis, Dr. Hill established that regional price differences for TiO₂ persist for significant periods. (PX5000 at 060-63 (¶¶ 138-43) (Hill Initial Report) (*in camera*)).

D. Dr. Hill Narrowly and Artificially Draws His Geographic Market to "North America," Which He Defines as the United States and Canada, Minus Mexico.

a. Dr. Hill Deliberately Limited His Analysis to "North America," Despite Acknowledging This Is a "Worldwide Merger."

330. Dr. Hill admits that the transaction at issue "is a worldwide merger." (Hill, Tr. 1903; Hill, Tr. 1782). But Dr. Hill admitted that "when it comes to a potential global TiO₂ market," he has "not done any of the analysis that [he] as an economist typically would do when analyzing a market." (Hill, Tr. 1944).

Response to Proposed Finding No. 330

The Proposed Finding is misleading and incomplete. It is uncontroverted that the parties have assets around the globe. Dr. Hill did not analyze whether there was a global antitrust market or not, because he found that a narrower market passed the hypothetical monopolist test. (CCFF ¶¶ 323-329). As explained in the Horizontal Merger Guidelines, "Defining a market broadly to include relatively distant product or geographic substitutes can lead to misleading market shares. This is because the competitive significance of distant substitutes is unlikely to be commensurate with their shares in a broad market." (PX9085 at 008 (Horizontal Merger Guidelines, § 4)).

331. For example, Dr. Hill only ran one of his models using worldwide market shares for rutile TiO₂,³² and this model run predicted that the merger would not be profitable. (Shehadeh,

³² This was a Cournot model run for a global rutile titanium dioxide market. (Shehadeh, Tr. 3203, 3392). This model run is discussed *infra* Proposed Findings of Fact ("FOF") at ¶¶ 693-95.

Tr. 3203, 3392, 3399-3400; Hill, Tr. 1781-82). Dr. Hill did not run any other model simulations over a global geography. (Shehadeh, Tr. 3203, 3392). Instead, Dr. Hill ran the rest of his models using a North America-only and chloride-process-only market. (Shehadeh, Tr. 3203, 3392-93).

Response to Proposed Finding No. 331

The Proposed Finding is misleading, incomplete, and factually inaccurate. Dr. Hill did not discuss any model of competition in a global market in his expert reports. Dr. Shehadeh is referring to a spreadsheet in Dr. Hill's backup materials, which makes no mention of profits. (PX7056 (Hill, Dep. at 137-41) (*in camera*)). In general, Dr. Hill explains that firms value total profits, not just variable ones, which are measured in the Cournot model. (CCFF ¶ 694). If the merger also provides fixed cost savings for the firm, then it could be profitable in terms of total profits. (CCFF ¶ 694). Therefore, it is not material whether or not the merger simulation shows that the transaction would not be profitable in variable terms.

332. Chief Judge Chappell pressed Dr. Hill about why he did not run his economic model for a worldwide market even though he admitted that the transaction was global in nature. (Judge Chappell, Tr. 1783). Dr. Hill's basis for running his models over a North America-only market was his "assumption" that the geographic market is North American only. (Hill, Tr. 1784-85). As Dr. Hill testified:

JUDGE CHAPPELL: Just so I'm clear, the variables you plugged into your model were based on the assumption that the geographic model in this—the geographic market in this case is North America, excluding Mexico, and the product market is chloride process titanium dioxide?

THE WITNESS: That is correct, Your Honor. In both of my models, that's correct. (Hill, Tr. 1784-85).

Response to Proposed Finding No. 332

The Proposed Finding is misleading and incomplete. After completing his thorough analysis of qualitative information, data, and explicit performance of the hypothetical monopolist test to define a relevant market, and concluding that the sale of chloride TiO₂ to North American customers was a valid antitrust market, Dr. Hill used that market for the purpose of parameterizing the Cournot and capacity closure models. (CCFF ¶¶ 23-373). The Horizontal Merger Guidelines

support the idea of focusing on narrow markets for the reasons laid out in response to Proposed Finding No. 330. Therefore, it was appropriate for Dr. Hill to focus on the North American market rather than expand the geographic market further.

333. Dr. Hill's Cournot model could have been fully applied worldwide, but Dr. Hill chose not to "analyz[e] the incentives worldwide." (Hill, Tr. 1782-83). Instead, Dr. Hill only analyzed "the profitability or incentives in the North American market." (Hill, Tr. 1782-83). Indeed, Dr. Hill confirmed that in both of his models [the capacity closure model and Cournot model], "the variables [he] plugged into [his] model were based on the assumption that the . . . geographic market in this case is North America, excluding Mexico, and the product market is chloride process titanium dioxide." (Hill, Tr. 1784-85).

Response to Proposed Finding No. 333

The Proposed Finding is misleading and incomplete. Dr. Hill based his analyses on what his review of qualitative and quantitative data, and what his empirical analysis of real-world data, determined was a relevant antitrust market. (CCFF ¶¶ 323-29). The Horizontal Merger Guidelines support the idea of focusing on narrow markets for the reasons laid out in response to Proposed Finding No. 330. Therefore, it was appropriate for Dr. Hill to focus on the North American market rather than expand the geographic market further.

334. Dr. Hill admitted that "a good way to start looking for a candidate market is to look for areas of overlap between the merging firms"—but that is not what he did. (Hill, Tr. 1668-69; Hill, Tr. 1903). Ultimately, Dr. Hill ended his market definition inquiry right where he started—concluding that the "most relevant market" is "the sale of chloride titanium dioxide in the U.S. and Canada." (Hill, Tr. 1670).

Response to Proposed Finding No. 334

The Proposed Finding is misleading, incomplete, and factually inaccurate. First, the sale of chloride TiO₂ to customers in North America is clearly an area of overlap. (CCFF ¶ 375). Second, Dr. Hill had access to extensive qualitative information as well as data. His analyses of both supported the conclusion that North American customers had distinct preferences, and could not defeat efforts to price discriminate against them through arbitrage. (CCFF ¶¶ 259-322). Given

those facts, a market defined as the sale of chloride TiO₂ to customers in North America is a natural market to consider. (Hill, Tr. 1668-69). After identifying that as a potential candidate market, Dr. Hill then conducted the hypothetical monopolist test prescribed by the Merger Guidelines to test in a variety of different ways to test and confirm that the sale of chloride TiO₂ to customers in North America is indeed a relevant market. (CCFF ¶¶ 25, 323-29). Had this candidate market failed the hypothetical monopolist test, Dr. Hill would have then considered broader markets, but this was unnecessary here since a market defined as the sale of chloride TiO₂ to North American customers readily passed the hypothetical monopolist test. (Hill, Tr. 1670; CCFF ¶ 329).

335. Chief Judge Chappell observed that Dr. Hill's model was "front-running" because Dr. Hill applied it only to his preferred market, and not to other possible markets. (Judge Chappell, Tr. 1783).

Response to Proposed Finding No. 335

The Proposed Finding is misleading and incomplete. Judge Chappell questioned whether it was "front-running" because Dr. Hill "thought [an anticompetitive effect] was likely before [he] even ran the model." (Hill, Tr. 1783). Dr. Hill explained it was not, because he appropriately tested the relevant antitrust market first, using the hypothetical monopolist test, and that the models could have rejected the presumption of an anticompetitive effect, but they did not. (Hill, Tr. 1783-84).

336. As another example, Dr. Hill did not conduct "a hypothetical monopolist test or a capacity closure model based on [a] worldwide market." (Hill, Tr. 1944). Dr. Hill also did "not analyze[] the likelihood of anticompetitive coordinated effects in any markets other than for sales of chloride TiO₂ in North America and sales of rutile TiO₂ in North America." (Hill, Tr. 1945).

Response to Proposed Finding No. 336

The Proposed Finding is misleading and incomplete for the reasons laid out in response to Proposed Finding No. 332.

337. In short, Dr. Hill did not conduct any analysis of a worldwide market for TiO₂. (Hill, Tr. 1943).

Response to Proposed Finding No. 337

The Proposed Finding is misleading and incomplete for the reasons laid out in response to Proposed Finding No. 332.

b. Dr. Hill Narrowly Defines the Geographic Market in This Case as “North America,” Thereby Artificially Increasing Market Concentration.

338. Dr. Hill’s definition of the geographic market (i.e., sales to customers in North America) is “too narrow.” (Shehadeh, Tr. 3205). This is true for Dr. Hill’s hypothetical monopolist test,³³ which relied exclusively on his critical loss analysis. (Shehadeh, Tr. 3206). The effect of Dr. Hill’s drawing the geographic market too narrowly is “to calculate shares that are too high because they are limited to that market.” (Shehadeh, Tr. 3206). Specifically, it “increases the HHI.” (Shehadeh, Tr. 3206).

Response to Proposed Finding No. 338

The Proposed Finding is misleading and incomplete for the reasons laid out in response to Proposed Finding No. 332. In addition, the footnote 33 to the Proposed Finding is misleading and incomplete. While Dr. Hill used the hypothetical monopolist test described in the Horizontal Merger Guidelines, Dr. Shehadeh’s view contradicts the demand-centric approach laid out in the Horizontal Merger Guidelines (CCFF ¶¶ 360-62; *see also* PX9085 at 007 (Horizontal Merger Guidelines, § 4)). Dr. Shehadeh’s approach also departs from the Horizontal Merger Guidelines’ approach indicating that the hypothetical monopolist is “the only present and future seller of the relevant product(s) to customers in the region.” (CCFF ¶¶ 360-62; PX9085 at 017-18 (Horizontal Merger Guidelines, § 4.2.2.)).

339. Furthermore, and “more importantly, in the context of his merger simulation models,” the effect of Dr. Hill’s drawing the geographic market too narrowly is that it “constrains

³³ To define his relevant product market, Dr. Hill purportedly used the hypothetical monopolist test under the Merger Guidelines. (Hill, Tr. 1905). This test is designed to consider whether a hypothetical company that controlled all sales within North America could implement a small, but significant, non-transitory increase in price (“SSNIP”). (Shehadeh, Tr. 3258).

the effect of the scope of competition that is, in fact, being observed in the real world, and that effect drives through his models.” (Shehadeh, Tr. 3206).

Response to Proposed Finding No. 339

The Proposed Finding is misleading and incomplete for the reasons laid out in response to Proposed Finding No. 332.

340. Dr. Hill’s analysis of geographic market is “unreliable” because it “isn’t consistent with the real world.” (Shehadeh, Tr. 3202-03). Dr. Hill’s geographic market analysis does not properly take into account “the response of global trade to changes in relative prices in North America.” (Shehadeh, Tr. 3205-06). “[T]he global trade, the relationship between prices globally, all demonstrate that the market is global in scope.” (Shehadeh, Tr. 3206). Dr. Hill’s geographic market definition does not comport with “the economic evidence.” (Shehadeh, Tr. 3206).

Response to Proposed Finding No. 340

The Proposed Finding is misleading and incomplete for the reasons laid out in response to Proposed Finding No. 332. Moreover, Dr. Hill explains why the possible comovement of prices do not determine the boundaries of the relevant antitrust market. (CCFF ¶¶ 353-59). The mere existence of international trade does not imply that customers can defeat a price increase, and the qualitative and quantitative record consistently implies they cannot. (CCFF ¶¶ 259-300).

341. [REDACTED]

Response to Proposed Finding No. 341

The Proposed Finding is misleading and incomplete. Although it is uncontroverted that Mexico is part of the continent, North America, that is a separate matter from whether it should be considered part of the relevant antitrust market for this case. Dr. Hill shows that the evidence

supports the conclusion that Mexican consumers have different demands for chloride TiO₂ than do those in the United States and Canada. (CCFF ¶¶ 144-47). Consistent with this, many participants in the TiO₂ industry, including TZMI, define “North America” as a geographic region consisting of the United States and Canada only, excluding Mexico. (CCFF ¶¶ 147, 231; PX9077 at 013, 034-35 (TZMI Presentation: TiO₂ Pigment Supply/Demand Q1 2016)).

342. Dr. Hill’s inappropriately narrow application of the hypothetical monopolist test is partly “how he could end up with the result of excluding Mexico from his definition” of North America. (Shehadeh, Tr. 3261).

Response to Proposed Finding No. 342

The Proposed Finding is misleading and incomplete. Dr. Shehadeh does not explain how omitting Mexico could affect his econometric performance of the hypothetical monopolist test. Moreover, the proposition that Mexican customers are treated differently by the North American suppliers of TiO₂ is strongly supported in the evidence as noted in Response to Proposed Finding No. 341.

343. Dr. Hill’s geographic market is drawn too narrowly because in his hypothetical monopolist test, Dr. Hill “constrain[s] the ability of customers to turn to alternative sources of supply outside of North America.” (Shehadeh, Tr. 3205-06). Specifically, “Dr. Hill imposes on his hypothetical monopolist test that the hypothetical monopolist controls not just current and future supply in his candidate market, but current, future, and all potential supply in the candidate market and, therefore, inappropriately restricts the alternatives to which customers could return—could turn in response to a SSNIP.” (Shehadeh, Tr. 3257-58). This “has the effect of causing the [geographic] market to be drawn too narrowly.” (Shehadeh, Tr. 3205-06).

Response to Proposed Finding No. 343

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. Dr. Hill conducts the hypothetical monopolist test precisely as it is described in the Horizontal Merger Guidelines: “The hypothetical monopolist test requires that a hypothetical profit-maximizing firm that was the only present or future seller of the relevant product(s) to customers in the region

would impose at least a SSNIP on some customers in that region.” (PX9085 at 017 (Horizontal Merger Guidelines, § 4.2.2); *see also* CCF ¶ 360).

344. In his hypothetical monopolist test, Dr. Hill assumed that the only way to defeat a SSNIP imposed by a hypothetical monopolist is substitution away from the product or by “arbitrage.” (Hill, Tr. 1905). As a result, Dr. Hill’s hypothetical monopolist test is overly restrictive because “he restricts the scope of substitution and the scope of . . . arbitrage relative to what is properly considered in the Merger Guidelines.” (Shehadeh, Tr. 3260).

Response to Proposed Finding No. 344

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. Dr. Hill conducts the hypothetical monopolist test precisely as it is described in the Horizontal Merger Guidelines, “A region forms a relevant geographic market if this price increase would not be defeated by substitution away from the relevant product or by arbitrage, e.g., customers in the region travelling outside it to purchase the relevant product. In this exercise, the terms of sale for products sold to all customers outside the region are held constant.” (PX9085 at 017-18 (Horizontal Merger Guidelines, § 4.2.2); *see also* CCF ¶¶ 362-63).

345. Dr. Hill further defined arbitrage in an overly restrictive way, i.e., as “a customer buying product in one region and transporting that product by itself to another region.” (Hill, Tr. 1905). In other words, Dr. Hill defined “traveling” in its “most literal sense,” such that in order for a customer to substitute to Chinese supply of TiO₂, Dr. Hill “requires that the customer travel to China, take delivery in China, and bring that product back to North America.” (Shehadeh, Tr. 3260).

Response to Proposed Finding No. 345

The Proposed Finding is misleading and incomplete. Dr. Hill conducts the hypothetical monopolist test precisely as it is described in the Horizontal Merger Guidelines. (CCRRFF ¶¶ 343-44). The crucial detail for market definition is that it is solely focused on demand factors, “Market definition focuses solely on demand substitution factors, i.e., on customers’ ability and willingness to substitute away from one product to another in response to a price increase or a corresponding non-price change such as a reduction in product quality or service.” (PX9085 at 010 (Horizontal

Merger Guidelines, § 4); *see also* CCFE ¶¶ 360-63). Dr. Hill explains that the arbitrage requires that the customer buys in one region at a low price and arranges transport of the product itself to the higher-priced region, which is wholly a demand response. (Hill, Tr. 1720-21).

346. Under Dr. Hill’s definition of “arbitrage,” if a customer in North America reached out to Lomon Billions to get TiO₂, if that customer handled shipping it would count as “arbitrage,” but if Lomon Billions handled shipping and the customer picked up the product at the port of Los Angeles that would not count as “arbitrage” according to Dr. Hill. (Hill, Tr. 1905-06).

Response to Proposed Finding No. 346

The Proposed Finding is misleading and incomplete. Dr. Hill conducts the hypothetical monopolist test precisely as it is described in the Horizontal Merger Guidelines. (CCRRFF ¶¶ 343-44). The reasoning laid out in response to Proposed Finding No. 345 also applies here. The first response identified in the Proposed Finding solely involves demand factors; however, the second alters the behavior of suppliers, and thus should not be considered as a demand response. (CCFE ¶¶ 360-63).

347. Dr. Hill’s analysis ignores evidence that customers in North America can and do turn to international suppliers for TiO₂, and the supply of international production to North American customers has increased in recent years, including from China. (Shehadeh, Tr. 3225; *see also* RX0170.0010;).

Response to Proposed Finding No. 347

The Proposed Finding is misleading and incomplete for the reasons described in Response to Proposed Findings No. 345 and 346.

348. 

Response to Proposed Finding No. 348

The Proposed Finding is misleading and wrongly characterizes Mr. Malichky's testimony.

The record is clear that Mr. Malichky viewed { [REDACTED]

[REDACTED] (CCFF ¶ 296; PX7025 (Malichky, Dep. at 93 ({ [REDACTED]

[REDACTED] } (in camera)).

349. Dr. Hill's analysis of the relationship between prices in North America and imports into North America also "has the effect of causing the market to be drawn too narrowly." (Shehadeh, Tr. 3205-06). This is because Dr. Hill's analysis of prices and imports "understate[s]" the relationship between prices in North America and imports; this also "has the effect of causing the market to be drawn too narrowly." (Shehadeh, Tr. 3205-06).

Response to Proposed Finding No. 349

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines. Within Dr. Hill's market definition analysis, consistent with the Horizontal Merger Guidelines, imports are properly considered part of the hypothetical monopolist. (CCFF ¶¶ 360-62; *see also* PX9085 at 017-18 (Horizontal Merger Guidelines, § 4.2.2)). Because the Horizontal Merger Guidelines follow the demand-centric approach for the market definition analysis, it is improper to consider supply-side responses, such as import response, while determining the scope of a relevant market. (CCFF ¶ 362; PX9085 at 007 (Horizontal Merger Guidelines, § 4); *see also* PX5004 at 034 (¶¶ 77-79) (Hill Rebuttal Report to Shehadeh) (in camera)).

350. "[W]hen Dr. Hill goes on to analyze the relationship between prices in North America and imports, he uses methods that understate that relationship and, as a result, does not provide reliable information on the responses of global trade to changes in relative prices in North America." (Shehadeh, Tr. 3205-06).

Response to Proposed Finding No. 350

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in response to Proposed Findings No. 349.

351. Dr. Hill's analysis of prices and imports leads to statistical predictions that are "in conflict with the real world." (Shehadeh, Tr. 3267-68).

Response to Proposed Finding No. 351

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in response to Proposed Findings No. 349. Moreover, Dr. Shehadeh's statement cited in the Proposed Finding provides no substance or citations to support the claim.

352. In the real world, a customer "making a decision about whether or not to purchase from a supplier in North America or seek supply from another source around the world . . . isn't going to just look at the prices in North America. That customer will also look at the alternatives, in Europe, in China." (Shehadeh, Tr. 3273-74).

Response to Proposed Finding No. 352

The Proposed Finding is misleading and incomplete. The overall record is clear that while some customers may entertain the possibility of engaging in arbitrage, the costs of doing so do not make that option commercially viable. (CCFF ¶¶ 291-300). Similarly, while firms may examine the feasibility of using imported sulfate TiO₂ in lieu of chloride TiO₂, the negative impact on their product quality and/or re-engineering costs are sufficiently high that the option is not viable for all but a tiny minority of North American customers. (CCFF ¶¶ 93-110).

353. Dr. Hill's calculation of the statistical relationship between imports and prices (his "import regression") implies that "the variation in global trade flows, including the variation in North America, has nothing to do with price from anywhere in the world except for China, and even for China, according to his regression, it's small. And that's simply not consistent with what the economic evidence shows in terms of the volume of trade and in terms of the relationship in prices across geographies that results." (Shehadeh, Tr. 3276).

Response to Proposed Finding No. 353

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in response to Proposed Findings No. 349.

354. Dr. Hill's import regression further "understates the responsiveness of imports to relative price changes" in North America because it ignores prices from suppliers outside North America. (Shehadeh, Tr. 3274).

Response to Proposed Finding No. 354

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in response to Proposed Findings No. 349.

While the Proposed Finding, like many other Proposed Findings in this section (*see* Respondents' Proposed Findings 349-51, 353-55, 357-63), improperly mixes a separate analysis of import response (which is relevant for other analyses under the Horizontal Merger Guidelines, i.e., effects and entry/expansion, but not relevant for the market definition analysis discussed in this section) into the geographic market analysis, the Proposed Finding, on its face, is also factually inaccurate and contrary to the weight of the evidence. Dr. Hill noted that including an additional price series in many of elasticity regression models can introduce the problem of multicollinearity, which prevents an analyst from recovering accurate estimates of the true parameters. His rebuttal report provided evidence that Dr. Shehadeh's regressions suffered from this problem, which caused them to produce inflated estimates of the actual sensitivity of import flows to price movements. (CCFF ¶ 672; PX5004 at 015-16 (¶¶ 27-34) (Hill Rebuttal Report to Shehadeh) (*in camera*))).

355. As a result of these errors in Dr. Hill's import regression, his "statistical world" is "strikingly different" from "what's happening in the real world." (Shehadeh, Tr. 3267-68). Specifically, Dr. Hill's analysis of prices and imports for geographic market definition is

“inconsistent” with the economic evidence of global trade flows and co-movement of TiO₂ prices across regions. (Shehadeh, Tr. 3276).

Response to Proposed Finding No. 355

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in Responses to Proposed Findings No. 270, 306, 309, 312, and 349, above. (*See also* CCFE ¶¶ 353-59).

356. The effect of Dr. Hill’s drawing the geographic market too narrowly doesn’t just affect his geographic market; it also affects his calculation of market shares and his analysis of competitive effects of the transaction. (Shehadeh, Tr. 3206).

Response to Proposed Finding No. 356

The Proposed Finding is misleading and incomplete. Dr. Hill’s market definition approach, faithfully following the Horizontal Merger Guidelines, is grounded in both empirical analysis of data and the qualitative evidence. (CCFE ¶¶ 23-373). Based on the relevant market defined after his thorough analysis laid out in his expert report, the inferences Dr. Hill ultimately draws about the likely competitive effects of the transaction similarly match the real-world views of other market participants. (CCFE ¶¶ 704-27).

357. Dr. Hill’s calculation of predicted loss for geographic market definition is unreliable because his regression analysis for imports to North America “understates the variation in price,” and “as a result, that would lead to drawing the market too narrowly.” (Shehadeh, Tr. 3269-70).

Response to Proposed Finding No. 357

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in Response to Proposed Findings No. 349.

Moreover, while the Proposed Finding is not relevant for the market definition analysis discussed in this section, the Proposed Finding, on its face, is also factually inaccurate and contrary to the weight of the evidence. Dr. Shehadeh is asserting that Dr. Hill's regressions are unreliable because of his use of a PPI measure, which he wrongly asserts leads to an understatement in the overall level of price variation. (Shehadeh, Tr. 3268-70). Dr. Hill showed in his rebuttal report that his usage of a PPI measure for price did not meaningfully affect the estimate of the import elasticity. (CCFF ¶¶ 364-68).

358. Dr. Hill's regression analysis is unreliable because it implies "that the imports that we observe from the rest of the world and the variation over time of the imports we observe from the rest of the world has nothing to do with price." (Shehadeh, Tr. 3267). To say that the significant variation in imports to North America from the rest of the world "has nothing to do with price as an indicator of demand in North America just to my eye doesn't pass the test." (Shehadeh, Tr. 3268).

Response to Proposed Finding No. 358

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in Response to Proposed Findings No. 349.

Moreover, while the Proposed Finding is not relevant for the market definition analysis discussed in this section, the Proposed Finding, on its face, is also factually inaccurate and contrary to the weight of the evidence for the reasons described in Response to Proposed Findings No. 354.

359. Dr. Hill's regression analysis is further unreliable because he uses a producer price index ("PPI") as the price for his candidate market. (Shehadeh, Tr. 3268-69). The PPI "reflects the prices earned by producers in the United States." (Shehadeh, Tr. 3269). This is a flaw in Dr. Hill's analysis because his "candidate market is *sales* to customers in North America," not producers in North America. (Shehadeh, Tr. 3269 (emphasis added)). As a result, Dr. Hill's price index for his regression analysis "[is not]... the price in the candidate market." (Shehadeh, Tr. 3269). Because the PPI "includes the prices earned on exports," which are outside Dr. Hill's candidate market, and because "it excludes the prices earned by suppliers from outside of North America into the candidate market," Dr. Hill's use of a PPI "leads to understating that relationship." (Shehadeh, Tr. 3269).

Response to Proposed Finding No. 359

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in Response to Proposed Findings No. 349.

Moreover, while the Proposed Finding is not relevant for the market definition analysis discussed in this section, the Proposed Finding, on its face, is also factually inaccurate and contrary to the weight of the evidence for the reasons described in Response to Proposed Findings No. 357.

360. Because Dr. Hill's regression analysis understates the variation in price, "it leads to an understatement in the identified relationship statistically," which, as a result, "would lead to drawing the [geographic] market too narrowly." (Shehadeh, Tr. 3270).

Response to Proposed Finding No. 360

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in Response to Proposed Findings No. 349.

Moreover, while the Proposed Finding is not relevant for the market definition analysis discussed in this section, the Proposed Finding, on its face, is also factually inaccurate and contrary to the weight of the evidence for the reasons described in Response to Proposed Findings No. 357.

361. Dr. Hill's regression analysis is further unreliable because his example of imports from the rest of the world "doesn't account for" prices outside of North America (e.g. in China or in Europe). (Shehadeh, Tr. 3273-74). This is flawed because a customer "making a decision about whether or not to purchase from a supplier in North America or seek supply from another source around the world . . . isn't going to just look at the prices in North America. That customer will also look at the alternatives, in Europe, in China." (Shehadeh, Tr. 3273). "And likewise, a supplier in China or in Europe will not be just looking at the price in North America. They'll be looking at the price in North America, in their home country, so, for example, China, and in the other countries to which they could supply." (Shehadeh, Tr. 3274). It is key to include all of these global prices in a regression analysis because "as we saw from that extent of global trade, [customers] have numerous options." (Shehadeh, Tr. 3274). For example, "when price goes up to \$4,000," Dr. Hill's regression "doesn't consider that the price outside of North America also went up, and so by doing so, it understates the responsiveness of imports to relative price changes." (Shehadeh, Tr. 3274).

Response to Proposed Finding No. 361

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in Response to Proposed Findings No. 349.

Moreover, while the Proposed Finding is not relevant for the market definition analysis discussed in this section, the Proposed Finding, on its face, is also factually inaccurate and contrary to the weight of the evidence for the reasons described in Response to Proposed Findings No. 354.

362. The effect of Dr. Hill's failure to consider prices outside of North America in his regression analysis "understates the responsiveness" and therefore his calculation "indicate[s] that the market is narrower than it in fact is from an economic perspective." (Shehadeh, Tr. 3276).

Response to Proposed Finding No. 362

The Proposed Finding is misleading, incomplete, and not relevant to the question of defining a geographic market under the Horizontal Merger Guidelines for the reasons described in Response to Proposed Findings No. 349.

Moreover, while the Proposed Finding is not relevant for the market definition analysis discussed in this section, the Proposed Finding, on its face, is also factually inaccurate and contrary to the weight of the evidence for the reasons described in Response to Proposed Findings No. 354.

363. All of the economic evidence, including "prices, the magnitude of imports, the elasticity of imports and the evidence from the economics literature" together "points to a conclusion that across the board that the relevant market is global." (Shehadeh, Tr. 3282-83).

Response to Proposed Finding No. 363

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The record is clear that the market for the sale of chloride TiO₂ to North American customers passes the hypothetical monopolist test and reflects the views of market participants. (CCFF ¶¶ 134-322).

364. Furthermore, for product market, Dr. Hill assumed that the geographic market was North America when testing whether chloride TiO₂ was a relevant product. (Hill, Tr. 1903).

Response to Proposed Finding No. 364

The Proposed Finding is misleading and incomplete. When testing whether chloride TiO₂ was a distinct product market, Dr. Hill did posit that North America was the relevant geographic market. However, he separately tested whether this assessment was valid, and found that it was consistent with the record. (*See* PX5000 at 040-67 (¶¶ 90-151) (Hill Initial Report) (*in camera*)).

365. For competitive effects analysis, “more importantly, in the context of his merger simulation models,” drawing the geographic market too narrowly “constrains the effect of the scope of competition that is, in fact, being observed in the real world.” (Shehadeh, Tr. 3206).

Response to Proposed Finding No. 365

The Proposed Finding is misleading and incomplete. While errors in the relevant scope may lead to mistaken competitive effects estimates, the weight of the evidence strongly supports that Dr. Hill’s proposed market passes the hypothetical monopolist test and constitutes a valid antitrust market according to the Horizontal Merger Guidelines. (CCFF ¶¶ 134-322).

V. THE RELEVANT PRODUCT MARKET INCLUDES ALL RUTILE TIO₂, WHETHER FROM THE SULFATE PROCESS OR CHLORIDE PROCESS.

366. The “relevant product market in which to evaluate the likely competitive effects of the proposed acquisition of Cristal by Tronox includes both sulfate-produced and chloride-produced rutile titanium dioxide.” (Shehadeh, Tr. 3283).³⁴

Response to Proposed Finding No. 366

The Proposed Finding is based entirely upon an opinion that is misleading and contrary to the weight of the evidence. The record evidence, based upon the Respondents’ own documents,

³⁴ Notably, Complaint Counsel’s claim here regarding the product market for TiO₂ cannot be reconciled with the FTC’s own past positions. When reviewing TiO₂ producer DuPont’s proposed acquisition of the TiO₂ division of Imperial Chemical Industries (“ICI”) in 1998, the FTC found direct competition between chloride- and sulfate-process TiO₂. In the merger review, the Commission found a single TiO₂ market that included both sulfate- and chloride-process TiO₂ and acknowledged the significant global trade in TiO₂. (*See* RX1598).

the testimony of numerous market participants, and economic data and analyses, clearly demonstrates that the relevant product market should be limited to chloride TiO₂. (CCFF ¶¶ 26-329). For example, North American customers overwhelmingly purchase chloride TiO₂ because they demand the superior quality, brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers cannot readily switch to sulfate TiO₂, in part due to high costs, testing time and need for point-of-sale tinting. (CCFF ¶¶ 93-110). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-133). Footnote 34 to the Proposed Finding is irrelevant in that it refers to an unrelated transaction and misleading in that it incorrectly characterizes the Commission's analysis of the DuPont/ICI merger. The DuPont/ICI transaction was proposed 20 years ago, and Respondents point to no evidence to suggest that the market conditions today are comparable to the market conditions in 1998. Moreover, the Commission had similar concerns on competitive effects: that the proposed transaction would give DuPont "control over a very substantial percentage of the supply of TiO₂ for North American customers" and DuPont's remedy proposal "did not address the elimination of a competitor that stood in the way of coordinated behavior." (RX1598 at 0013). In the end, DuPont ultimately abandoned the transaction so the transaction was never litigated.

367. The economic evidence supporting a product market of both sulfate-produced and chloride-produced rutile TiO₂ includes "the comovement in prices," the variation in imports of sulfate-process and chloride-process TiO₂ into North America, "commercial data" from suppliers, "industry studies," and "the testimony of customers and producers." (Shehadeh, Tr. 3284-85).³⁵³⁶

³⁵ Comovement is apparent even during market extremes - notably, when chloride-produced TiO₂ was nearly \$4,000 per MT (FOF ¶361), sulfate-produced TiO₂ was also almost \$4,000 per MT. (*See, for example*, RX0170-30 and 31, figure 13 and 14 (showing sulfate-produced TiO₂ at the same price or higher than chloride-produced TiO₂ when buying from Venator and Kronos at the market's peak).

³⁶ The FTC has not proposed a titanium dioxide slurry market in this case. (Hill, Tr. 1948-49) ("Q. Doctor, I just want to make sure that we're clear on the record for the court. You've not defined a chloride TiO₂ slurry market in North America, right? A. That is correct. Q. And you're not presenting an opinion that North American slurry is a

Response to Proposed Finding No. 367

The Proposed Finding is misleading in that it cites to evidence that is unreliable and contrary to the weight of the evidence. The comovement of prices is unreliable for purposes of antitrust market definition and prone to error. (CCFF ¶¶ 353-59). The variation in *imports* of sulfate TiO₂ and chloride TiO₂ into North America is irrelevant because the *proportion of use* of chloride TiO₂ to sulfate TiO₂ has remained consistent in North America. (CCFF ¶¶ 46, 117). This shows that substitution between chloride TiO₂ and sulfate TiO₂ is limited, and variation in imports does not address this issue. The evidence in the record shows that customers and suppliers treat sulfate TiO₂ and chloride TiO₂ as separate products. (CCFF ¶¶ 26-133). Footnote 35 is factually incorrect and misleading for the reasons set forth in CRRFF ¶¶ 419-22. Footnote 36 to the Proposed Finding is misleading and incomplete in that it suggests that slurry is irrelevant to the market definition inquiry. Rather, the record evidence shows that North American TiO₂ customers have unique demand for chloride TiO₂ in slurry form, which further shows the difficulty of arbitrage for North American customers. (CCFF ¶¶ 313-22).

368. The purpose of defining a relevant product market “is to understand the scope of products among which customers do and can switch in response to relative price changes.” (Shehadeh, Tr. 3283). It “include[s] not only historical evidence of customers switching at *current prices* but also evidence about the switching that customers could undertake and would undertake *in response to a SSNIP*.”³⁷ (Shehadeh, Tr. 3284 (emphases added)). Because today “we observe customers already switching at current prevailing prices,” this means that “substitution will be

relevant market; correct? A. Correct, I am not presenting that opinion.”). Slurry is simple to make from dry titanium dioxide (which is easily shipped overseas). Many titanium dioxide customers already make their own slurry.

Engle, Tr. 2452 (explaining that there is no “technical reason why you would be unable to make slurry out of TiO₂ made from the slurry process”).

³⁷ For example, according to Dr. Hill, “if 15 percent of volume switched in response to a SSNIP of 10 percent, then that would be sufficient to expand the market beyond” chloride-process only TiO₂. (Shehadeh, Tr. 3322). If the SSNIP were 5 percent, the number would change to 7.5 percent of customers needing to switch. (Shehadeh, Tr. 3322).

hastened and extended by a change in relative prices that makes sulfate relatively more favorable given its lower price because the SSNIP is only applied to chloride.” (Shehadeh, Tr. 3321-22).

Response to Proposed Finding No. 368

The Proposed Finding is not supported by the evidence cited and is contrary to the weight of the evidence. Dr. Shehadeh has provided no basis for his claim that customers are “already switching at current prevailing prices,” and, in fact, the customers testified that they are not currently switching to sulfate TiO₂ and have not switched even when chloride TiO₂ was significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33). The record evidence is clear that North American customers cannot readily switch to sulfate TiO₂ due the significant costs, testing time, and quality risks to their products. (CCFF ¶¶ 93-133). These risks are especially acute in North America because of point-of-sale tinting. (CCFF ¶¶ 105-10). Dr. Shehadeh’s opinion should be given no weight because it is inconsistent with the evidence.

A. Chloride- and Sulfate-Process TiO₂ Are Interchangeable for the Vast Majority of End-Use Applications.

369. About 80% of TiO₂ end products can be made with either the sulfate or chloride processes. (Turgeon, Tr. 2622-23; Stern, Tr. 3835-39). Indeed, a TiO₂ industry study states that “80 percent of end applications are indifferent towards chloride and sulfate, provided quality is the same.” (Shehadeh, Tr. 3319; RX1503.0014). “[T]here’s universal agreement with that assumption among the experts” that the vast majority of end-use applications are indifferent to chloride process and sulfate process, provided quality is the same. (Shehadeh, Tr. 3673-74; RX1503.0014).³⁸ About 10% of products are more compatible with the sulfate process, and about 10% of products are more compatible with the chloride process. (Turgeon, Tr. 2622-23). So while “[t]here is some specific product that are easier to make from the sulfate process pigment, and there is some specific product that are easier to make from the chloride pigment,” for “the vast majority of the application, like 80 percent, you could be one or the other.” (Turgeon, Tr. 2622-23). “[I]t doesn’t matter for the end result, the end product.” (Turgeon, Tr. 2623; Stern, Tr. 3836, 3838; PX9020-007; RX1503.0013). Tronox sold both chloride and sulfate-process TiO₂ until it closed its Savannah plant when it had financial difficulties. (Engle, Tr. 2445-46 (explaining Tronox personnel’s expertise in sulfate-process TiO₂); Romano, Tr. 2249; Dean, Tr. 2947 (discussing the closing of the Savannah plant)).

³⁸ Customer testimony elicited by complaint counsel at trial about the differences between chloride and sulfate product was provided by non-expert, non-chemists, who primarily focus on purchasing and product testing or formulation at their companies. (Malichky, Tr. 275 (“I would not say that I’m a chemist... but I have enough that I can survive most conversations.”)).

Response to Proposed Finding No. 369

The Proposed Finding is incomplete and contrary to the weight of the evidence. The Proposed Finding is also misleading because the relevant antitrust question is not whether a customer *can* make a product with either chloride TiO₂ or sulfate TiO₂ but whether customers *would* switch to sulfate TiO₂. (PX9085 at 010-18 (Horizontal Merger Guidelines, § 4); PX5002 at 012-13 (¶¶ 19-21) (Hill Rebuttal Report to Stern and Imburgia)). The record evidence from companies that actually use TiO₂ in their products shows that North American customers overwhelmingly purchase chloride TiO₂ because they demand the high quality, brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). Moreover, North American customers cannot readily switch to sulfate TiO₂, due to high costs, testing time, and in-store tinting. (CCFF ¶¶ 93-110). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33). Respondents cite to a study by Bain & Company but that study should be given little or no weight because Bain & Company is not a TiO₂ market participant and did not interview a single customer or two of the major TiO₂ producers—Chemours and Kronos. (RX1503 at 0013). The study also mostly relied upon secondary sources dating between 2007 and 2012. (RX1503 at 0013). The study itself does not specify whether North American customers have particular needs served only by chloride TiO₂ or sulfate TiO₂. (RX1503 at 0014). Moreover, the Bain study states that many customers are indifferent about whether they use sulfate TiO₂ and chloride TiO₂ *if* the quality between the two is the same. (RX1503 at 0014). The record evidence demonstrates that the quality and attributes of chloride TiO₂ is superior to that of sulfate TiO₂. (CCFF ¶¶ 46-92).

The record evidence, including testimony and documents from customers, demonstrates that customers cannot switch to sulfate TiO₂ for the vast majority of their products. (CCFF ¶¶ 46-110). The testimony of the customers themselves should be preferred to the testimony of Tronox executives on the question of whether *customers* would use sulfate TiO₂ in place of chloride TiO₂ because the customers have the best understanding of their own product needs. The testimony of Mr. Turgeon regarding the differences between sulfate TiO₂ and chloride TiO₂ should be given little weight because he has limited experience with respect to sulfate TiO₂. (Turgeon, Tr. at 2579-82). He has not operated a sulfate TiO₂ plant (having joining Tronox in 2014 after the Savannah sulfate plant was closed), nor has he had responsibility for purchasing TiO₂ for a customer (having only worked at Rio Tinto, a mining company, and Tronox). (*See* Turgeon, Tr. at 2579-82; *see also* Dean, Tr. 2947 (Savannah sulfate closed in 2008 or 2009)). Respondents' reference to "financial difficulties" is incomplete and misleading in that it fails to explain that the Savannah plant was sold during Tronox's bankruptcy { [REDACTED] } (Christian, Tr. 961; Romano, Tr. 2208-10, 2165 (*in camera*)). Footnote 38 to the Proposed Finding is incomplete because it fails to state that Mr. Malichky has a background in chemistry, toxicology, and pharmacology. (Malichky, Tr. 275). In addition, Mr. Malichky has knowledge of the various chemical tests conducted by PPG chemists, such as analysis on particle size, particle size distribution, morphology, impurities, and surface treatments. (Malichky, Tr. 342).


370. "[Y]ou could make a very good paint with a sulfate TiO₂ and you could make a very good paint with a chloride TiO₂." (Turgeon, Tr. 2622). "[I]f you control your sulfate process properly, the quality of the sulfate pigment is as good and even better than the quality of the chloride pigment in some case." (Turgeon, Tr. 2622).³⁹

³⁹ Although impurities in raw TiO₂ can be affected by the production process, impurities in the finished product are impacted more by the feedstock used for production. (Turgeon, Tr. 2584; Engle, Tr. 2441 (testing impurities in feedstock); Engle, Tr. 2439 (purification that occurs *after* the chlorination process)).

Response to Proposed Finding No. 370

The Proposed Finding is vague with respect to the term “very good paint,” misleading, and contrary to the weight of the evidence. The term “very good paint” has no specific meaning and provide no context as to the consumers’ expectations for quality paint. The record evidence, including evidence provided by companies who actually make paint and other products, shows that chloride TiO₂, has different characteristics, outperforms sulfate TiO₂ in products, and North American customers demand chloride TiO₂ in their products. (CCFF ¶¶ 46-133). North American customers overwhelmingly purchase chloride TiO₂ because they demand the high quality, brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33). The testimony of the customers themselves should be preferred to the testimony of Tronox executives on the question of whether *customers* would use sulfate TiO₂ in place of chloride TiO₂ because the customers have the best understanding of their own product needs. The testimony of Mr. Turgeon regarding the differences between sulfate TiO₂ and chloride TiO₂ should be given little weight because he has limited experience with respect to sulfate TiO₂. (Turgeon, Tr. at 2579-82). He has not operated a sulfate TiO₂ plant (having joining Tronox in 2014 after the Savannah sulfate plant was closed), nor has he held responsibility for purchasing TiO₂ for a customer (having only worked at Rio Tinto, a mining company, and Tronox). (See Turgeon, Tr. at 2579-82; see also Dean, Tr. 2947 (Savannah sulfate closed in 2008 or 2009)). Footnote 39 is incomplete because it fails to explain that chloride TiO₂ production requires higher quality feedstock, *i.e.* feedstock with fewer impurities, than sulfate TiO₂ production. (CCFF ¶ 32; Christian, Tr. 791-92, 795).

371. **Response to Proposed Finding No. 371**

The Proposed Finding is misleading, incomplete, and vague as to the term “interchangeable.” The term has no specific meaning and provides no context as to the customers’ expectations regarding utility of TiO₂. The record evidence is replete with evidence that North American customers view chloride TiO₂ and sulfate TiO₂ as distinct products with different characteristics. (CCFF ¶¶ 46-133 (chloride TiO₂ has a blue undertone, is brighter, is more durable, and has other properties over sulfate TiO₂)). The Proposed Finding is vague as to the phrases “very competitive” and “technically replace.” These terms have no specific meaning and provide no context as to the significances of the purported competition. The record evidence is clear that customers do not consider Chinese sulfate products, including Lomon Billions’ sulfate TiO₂ products, to be comparable to Tronox’s chloride products. (CCFF ¶¶ 46-133, 808-12). For example, {  } (CCFF ¶¶ 35, 57, 66, 77, 88). The testimony of the customers themselves should be preferred to the testimony of Tronox executives on the question of whether *customers* would use sulfate TiO₂ in place of chloride TiO₂ because the customers have the best understanding of their own product needs.

⁴⁰ Mr. Jeffrey Engle is the vice president of marketing and product development at Tronox. (Engle, Tr. 2433). Mr. Engle leads Tronox’s research and development laboratory in Oklahoma City. (Engle, Tr. 2437). Mr. Engle has a degree in chemical engineering from Oklahoma State University and an MBA from Auburn University in 2006. (Engle, Tr. 2433-34). Mr. Engle began working as a technical service engineer for Tronox in 2006. (Engle, Tr. 2434).

The Proposed Finding is also misleading because the relevant antitrust question is not if a customer *can* make a product with either chloride TiO₂ or sulfate TiO₂ but whether customers *would* switch to sulfate TiO₂. (PX9085 at 010-18 (Horizontal Merger Guidelines, § 4); PX5002 at 012-13 (¶¶ 19-21) (Hill Rebuttal Report to Stern and Imburgia)). The record evidence from companies that actually use TiO₂ in their products shows that North American customers overwhelmingly purchase chloride TiO₂ because they demand the high quality, brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33). Footnote 40 to the Proposed Finding is irrelevant. Mr. Engle was never qualified as an expert in this matter and thus his statements should be given particularly little weight, where, as here, they are inconsistent with what the customers actually testified to at trial.

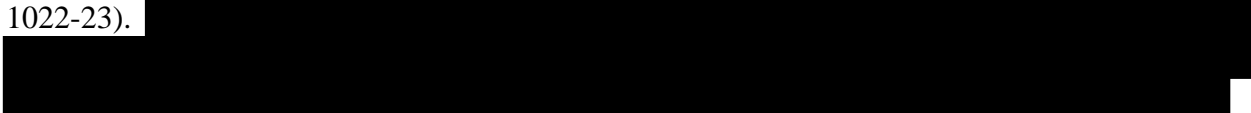
372. Paints and coatings produced with chloride-process and sulfate-process TiO₂ can look “exactly the same.” (Engle, Tr. 2466-67) (referring to RXD-0016, which shows samples of CR-828 and CR-826, Tronox’s chloride product, compared with TR92, a sulfate-made Venator product); Engle, Tr. 2464-65).

Response to Proposed Finding No. 372

The Proposed Finding is vague, misleading, not supported by the evidence cited, and relies on improper evidence. The demonstrative cited and discussed by Mr. Engle was not admitted into evidence and the Order on Post-Trial Briefs specifically precludes citing demonstratives as substantive evidence. (Order on Post-Trial Briefs, June 27, 2018). In addition, in the trial record, it appears that Mr. Engle’s testimony is regarding the similarity between CR-828 and CR-826, both Tronox chloride TiO₂ products. (Engle, Tr. 2466-67). This does not support the assertion that chloride TiO₂ products and sulfate TiO₂ products can look “exactly the same.” At the very

least, the trial record is unclear and no conclusion can be drawn about Mr. Engle's testimony regarding this demonstrative.

The Proposed Finding also fails to account for non-visible differences in quality and performance, such as scrubbability, durability, dry time, performance in the formulation, and tint strength. (CCFF ¶¶ 46-92). The testimony of the customers themselves should be preferred to the testimony of Tronox executives on the question of whether *customers* would use sulfate TiO₂ in place of chloride TiO₂ because the customers have the best understanding of their own product needs. The record evidence from companies that actually use TiO₂ in their products shows that North American customers overwhelmingly purchase chloride TiO₂ because they demand the high quality, brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33).

373. Sulfate-process TiO₂ can also be "comparable" to chloride-process TiO₂ with respect to relative tint strength versus relative hiding power. (Engle, Tr. 2463-65; Pschaidt, Tr. 1022-23). 

Response to Proposed Finding No. 373

The Proposed Finding is vague as to the words "comparable" and "compare well," misleading, and contrary to the weight of the evidence. These terms have no specific meaning and provide no context as to the significances of the purported competition or the customer's quality expectations. The Proposed Finding is misleading and incomplete. In the cited trial testimony, Mr. Pschaidt is discussing RX0076 at 0016-17. The first page shows a chart with two lines—one for chloride TiO₂ and one for sulfate TiO₂—and compares relative tint strength with relative hiding power. Mr. Pschaidt explained that the chart shows "the tint strength of most of the sulfate products is below the higher performing chloride-based products." (Pschaidt, Tr. 1023). The

second page shows a chart comparing pigment color of chloride TiO₂ and sulfate TiO₂. In this chart, the majority of the chloride TiO₂ performs better than the majority of sulfate TiO₂. Mr. Pschaidt also explained [REDACTED] [REDACTED] (CCFF ¶ 39 { [REDACTED] [REDACTED] }, ¶ 53-54 { [REDACTED] [REDACTED] }, ¶64 { [REDACTED] [REDACTED] }). The record evidence indicates that industry participants find that chloride TiO₂ has better tint strength than sulfate TiO₂. (CCFF ¶¶ 38, 88, 92).

The Proposed Finding is also misleading because the relevant antitrust question is not if a customer *can* make a product with either chloride TiO₂ or sulfate TiO₂ but whether customers *would* switch to sulfate TiO₂. (PX9085 at 010-18 (Horizontal Merger Guidelines, § 4); PX5002 at 012-13 (¶¶ 19-21) (Hill Rebuttal Report to Stern and Imburgia)). The record evidence from companies that actually use TiO₂ in their products shows that North American customers overwhelmingly purchase chloride TiO₂ because they demand the brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33).

374. For durability of TiO₂ pigment, “95 percent of that technology is in surface treating,” rather than the manufacturing process. (Engle, Tr. 2477). To improve a TiO₂ pigment’s durability, the process that Tronox would focus on “would be 100 percent finishing and treatment,” rather than the manufacturing process. (Engle, Tr. 2480).⁴¹

Response to Proposed Finding No. 374

41 [REDACTED]

The Proposed Finding is misleading, incomplete, and irrelevant. The testimony of the customers themselves should be preferred to the testimony of Tronox executives on the durability of sulfate TiO₂ compared to chloride TiO₂ because the customers have the best understanding of the durability requirements of their own products. The record evidence overwhelmingly shows that North American customers find that chloride TiO₂ is more durable than sulfate TiO₂. (CCFF ¶¶ 75-84). Additionally, the surface treatments that provide durability and other performance characteristics are more readily available for chloride TiO₂ than for sulfate TiO₂. (CCFF ¶ 84). Footnote 41 to the Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The record evidence shows that { [REDACTED] }, the application referenced by Mr. Young, is considered { [REDACTED] }. (Young, Tr. 668-69 (*in camera*); Christian, Tr. 816-17 (*in camera*)).

375. Other TiO₂ producers have also testified that chloride-process TiO₂ can be used interchangeably with sulfate-process TiO₂ in the vast majority of end-use applications. (Christian, Tr. 893-96). For instance, Kronos agreed that both chloride-process and sulfate-process TiO₂ are “suitable” for use in the vast majority of end-use applications, including:

- “architectural coatings”;
- “house paints”;
- “decorative coatings”;
- “industrial coatings”;
- “plastic for packaging” (e.g., polyolefins);
- “plastics for the construction sector”; and
- “laminated paper.”⁴² (Christian, Tr. 893-96).

Response to Proposed Finding No. 375

The Proposed Finding is vague as to the word “suitable”, misleading, and contrary to the weight of the evidence. The term has no specific meaning and provides no context as to the

⁴² [REDACTED]

automotive coatings, marine coatings, other transport coatings, plastics for packaging (i.e. mainly polyolefins), plastics for construction sector (i.e. mainly PVC), and laminated paper). (Christian, Tr. 918).

significances of the customer's quality expectations. The relevant antitrust question is not if a customer *can* make a product with either chloride TiO₂ or sulfate TiO₂ but whether customers *would* switch to sulfate TiO₂. (PX9085 at 010-18 (Horizontal Merger Guidelines, § 4); PX5002 at 012-13 (¶¶ 19-21) (Hill Rebuttal Report to Stern and Imburgia)). The record evidence, including statements by Mr. Christian of Kronos, a TiO₂ supplier to a range of North American customers across various end uses (Christian, Tr. 772-73), shows that North American customers overwhelmingly purchase chloride TiO₂ because they demand the brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers cannot readily switch to sulfate TiO₂ because of high costs, testing time and in-store tinting. (CCFF ¶¶ 93-110). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33). Customers have different requirements for TiO₂ based on their own products and business plans. (Christian, Tr. 897). Rather, Mr. Christian explained that there are customers who only purchase chloride TiO₂ for certain end-use applications because only chloride TiO₂ has the quality necessary. (Christian, Tr. 892-93). Indeed, Kronos's chloride TiO₂ products are superior to its sulfate TiO₂ products. (Christian, Tr. 960). The weight of the record evidence, including Respondents' own documents, demonstrates that the TiO₂ producers do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22). Footnote 42 of the Proposed Finding is incomplete and misleading because Mr. Christian explained that while { [REDACTED] }.

(Christian, Tr. 955 (*in camera*)).

376. In short, "most end-use applications can use pigments produced by either process." (Christian, Tr. 896).

Response to Proposed Finding No. 376

The Proposed Finding is misleading and contrary to the weight of the evidence for the reasons set forth in CCRRFF ¶ 375.

377. [REDACTED]

Response to Proposed Finding No. 377

The Proposed Finding is misleading and incomplete because the relevant antitrust question is not if a customer *can* make a product with either chloride TiO₂ or sulfate TiO₂ but whether customers *would* switch to sulfate TiO₂. (PX9085 at 010-18 (Horizontal Merger Guidelines, § 4); PX5002 at 012-13 (¶¶ 19-21) (Hill Rebuttal Report to Stern and Imburgia)). The record evidence, including evidence provided by companies that actually utilize TiO₂ in coatings and other products, shows that chloride TiO₂ outperforms sulfate TiO₂ in products, and North American customers demand chloride TiO₂ in their products. (CCFF ¶¶ 46-92). Coatings companies would suffer a performance loss by switching to sulfate TiO₂ because chloride TiO₂ has higher quality, superior brightness, durability, and other performance attributes compared to sulfate TiO₂. (CCFF ¶¶ 46-92).

B. The Chloride and Sulfate Processes Are Conceptually Similar, and the Resulting Pigment Is Chemically Identical.

378. “[I]f you use the chloride process or if you use the sulfate process, you end up with the same TiO₂ molecule at the end.” (Turgeon, Tr. 2673). Since TiO₂ is TiO₂, “at the end, you can make paint with the TiO₂ molecule the same way if it came from chloride or if it came from sulfate.” (Turgeon, Tr. 2673-74).

Response to Proposed Finding No. 378

The Proposed Finding is misleading and contrary to the weight of the evidence. The testimony of Mr. Turgeon regarding the differences between sulfate TiO₂ and chloride TiO₂ should be given little weight because he has limited experience with respect to sulfate TiO₂. He

has not operated a sulfate TiO₂ plant (having joining Tronox in 2014 after the Savannah sulfate plant was closed), nor has he held responsibility for purchasing TiO₂ for a customer (having only worked at Rio Tinto, a mining company, and Tronox). (See Turgeon, Tr. at 2579-82; see also Dean, Tr. 2947 (Savannah sulfate closed in 2008 or 2009)). Mr. Engle (Mr. Turgeon's colleague) admitted that two different Tronox TiO₂ grades (CR-826 and CR-828) are different and "will differ quite significantly in certain formulations." (Engle, Tr. 2466). The record evidence, including evidence provided by companies who actually make paint and other products, shows that chloride TiO₂, has different characteristics, outperforms sulfate TiO₂ in products, and North American customers demand chloride TiO₂ in their products. (CCFF ¶¶ 46-92). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33). As Mr. Malichky explained, there are differences in impurities and morphology that explain the differences between chloride TiO₂ and sulfate TiO₂; it is not just an issue of the TiO₂ molecule. (Malichky, Tr. 275-77, 339-40). For instance, Sherwin-Williams explained that { [REDACTED] [REDACTED] }. (CCFF ¶¶ 38, 89).

379. Although there are some differences between the two, the chloride process is similar in key respects to the sulfate process. (Engle, Tr. 2444). "[T]hey're basically both ways of extracting whatever iron is left in the feedstock, extracting that out." (Engle, Tr. 2444). One process uses chloride to "reduce the TiO₂" and "take out the iron" (chloride process) and another process "us[es] sulfuric acid to do it." (Engle, Tr. 2444). "So the concept is really the same." (Engle, Tr. 2444).

Response to Proposed Finding No. 379

The Proposed Finding is misleading and contrary to the weight of the evidence. Mr. Engle's statements comparing the chloride process and sulfate process was "at a high level" and should be given little to no weight because he admits that he is only "somewhat" familiar with the sulfate process (having only been narrowly involved in sulfate production several years ago).

The Proposed Finding is misleading. The testimony of Mr. Turgeon regarding the differences between sulfate TiO₂ and chloride TiO₂ should be given little weight because he has limited experience with respect to sulfate TiO₂. He has not operated a sulfate TiO₂ plant (having joining Tronox in 2014 after the Savannah sulfate plant was closed), nor has he been held responsible for purchasing TiO₂ for a customer (having only worked at Rio Tinto, a mining company, and Tronox). (Turgeon, Tr. at 2579-82; *see also* Dean, Tr. 2947 (Savannah sulfate closed in 2008 or 2009)). The record evidence, including evidence produced by companies who actually make paint, shows that chloride TiO₂ outperforms sulfate TiO₂ in products, and North American customers demand chloride TiO₂ in their products. (CCFF ¶¶ 46-92). As Mr. Malichky explained, there are differences in impurities and morphology that explain the differences between chloride and sulfate TiO₂. (Malichky, Tr. 275-77, 339-40). Additionally, the { [REDACTED] [REDACTED] [REDACTED] }. (CCFF ¶ 84). Furthermore, Tronox only produces chloride TiO₂, so the views of Tronox's executives are of limited value because they do not have sulfate production facilities to compare to their chloride TiO₂ plants. In comparison, the views of other TiO₂ producers, including those who currently have both sulfate and chloride plants, is that chloride TiO₂ is a higher quality, brighter, more durable pigment than sulfate TiO₂. (CCFF ¶¶ 32, 58-61, 73-74, 81-84, 92). As a result, TiO₂ producers, including the Respondents, understand that North American customers demand chloride TiO₂ and have limited capability to switch to sulfate TiO₂. (CCFF ¶¶ 46-133).

382. The finishing process for chloride-process TiO₂ and sulfate-process TiO₂ are identical. (Engle, Tr. 2444). Finishing determines TiO₂ opacity due to milling, which makes the right particle size and aids optical efficiency, and surface treatment, which determines particle dispersion. (Engle, Tr. 2453-54). In some cases, surface treatments, a part of the TiO₂ finishing process, have reduced the TiO₂ necessary for formulas by as much as 20 percent. (Engle, Tr.

Specifically, customers will switch if prices for chloride-process TiO₂ increase relative to the prices for sulfate-process TiO₂. (Mouland, Tr. 1224-25).

Response to Proposed Finding No. 383

The Proposed Finding is misleading and contrary to the weight of the evidence. The testimony of the customers themselves should carry higher weight than the testimony of Tronox executives on the question of whether *customers* would use sulfate TiO₂ in place of chloride TiO₂ because the customers have the best understanding of their own product needs. The record evidence from companies that actually use TiO₂ in their products shows that North American customers overwhelmingly purchase chloride TiO₂ because they demand the brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers cannot readily switch to sulfate TiO₂, due to high costs, testing time and the need for in-store tinting. (CCFF ¶¶ 93-110). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33).

384. A TZMI industry report states that “[m]ost TiO₂ customers do not have a preference for the process that produces the product they desire.” (Shehadeh, Tr. 3311 (quoting RX1277.0090)). This is because “[c]ustomers are concerned primarily with the impact of purchased titanium dioxide on the end product’s value in use, and the end customer design specifications for the TiO₂ product as such.” (Shehadeh, Tr. 3311 (quoting RX1277.0090)). The TZMI industry report goes on: “TiO₂ end customers can and will switch to a producer with a different technology if the right arbitrage exists for the ‘substitute’ product and the product is capable of meeting the customer’s requirements.” (Shehadeh, Tr. 3312; RX1277.0090).

Response to Proposed Finding No. 384

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. RX1277 fails to account for the specific demand of North American customers for chloride TiO₂. Moreover, TZMI admits that it made no efforts “to independently verify” any information gathered. (RX1277 at 0003). The record evidence is clear that North American customers

does not purchase TiO₂ directly from any Chinese manufacturer, and less than 2% of its annual purchases are manufactured in China.”)).

The second customer, Mr. Tong from Ashland, noted that { [REDACTED] } (PX7051 (Tong, Dep. at 77-78) (*in camera*)). Moreover, { [REDACTED] } (PX7051 (Tong, Dep. at 77-78) (*in camera*)). The Proposed Finding is also vague, in that the word “large” does not provide any context for how much of the customer’s business rely upon TiO₂. For example, { [REDACTED] } (PX7034 (Tong, Dep. at 39) (*in camera*)).

386. Tronox’s chloride-process TiO₂ is rivaled by sulfate-process TiO₂ from producers Kronos, Venator, and Cristal, who “all make very good quality sulfate TiO₂ that we compete with directly.” (Romano, Tr. 2238). And “over [the] last ten to fifteen years and more importantly in the last five,” Chinese producers “have become an extremely competitive” producer of sulfate TiO₂, too. (Romano, Tr. 2239). All told, Tronox has “been competing head to head with sulfate TiO₂” for at least 30 years. (Romano, Tr. 2239).

Response to Proposed Finding No. 386

The Proposed Finding is vague as to the term “very good sulfate,” misleading and contrary to the weight of the evidence. The weight of the record evidence, including Respondents’ own documents, demonstrates that the TiO₂ producers do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22). Indeed, Kronos stated that its chloride TiO₂ products are superior to its sulfate TiO₂ products. (Christian, Tr. 960). The record evidence also shows that Chinese sulfate TiO₂ is not competitive with Tronox chloride TiO₂. (CCFF ¶¶ 789-812). North American customers overwhelmingly

purchase chloride TiO₂ because they demand the high quality, brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers cannot readily switch to sulfate TiO₂, due to high costs, testing time, and the need for in-store tinting. (CCFF ¶¶ 93-110). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33).

387. Customers that use chloride TiO₂ also purchase sulfate TiO₂, including for use in North America. For example:

[REDACTED]

Response to Proposed Finding No. 387

43 [REDACTED]

The Proposed Finding is misleading, incomplete, and factually inaccurate in that it fails to explain all the limitations in the customers' ability to use sulfate TiO₂.

a. PPG, a multinational manufacturer of architectural and industrial coatings (Malichky, Tr. 267-70), clearly testified that { [REDACTED] [REDACTED] } (CCFF ¶¶ 35, 57, 66, 77, 88, 96, 129).

b. { [REDACTED] [REDACTED] [REDACTED] } (CCFF ¶¶ 33-34, 56, 78, 87, 124-25, 132).

c. The Valspar statements quoted in the Proposed Finding are from { [REDACTED] [REDACTED] }, and are unreliable. In particular, Mr. Christian, from Kronos, stated that { [REDACTED] [REDACTED] } (Christian, Tr. 928-29 (*in camera*)). { [REDACTED] [REDACTED] } (Young, Tr. 736-37 (*in camera*)). Valspar is now part of Sherwin-Williams, a multinational manufacturer of architectural and industrial coatings, and { [REDACTED] [REDACTED] } (Young, Tr. 631, 633, 736-37 ({ [REDACTED] }) (*in camera*)). Sherwin-Williams also clearly explained that { [REDACTED] [REDACTED] }

[REDACTED]
[REDACTED] } (CCFF ¶¶ 36-38, 47, 51-52, 63, 66, 71, 75, 86, 89).

- d. The next two examples provided by Respondents are actually the same because Behr is a brand name owned by Masco, a North American manufacturer of architectural coatings. (Pschaidt, Tr. 963, 966). Behr makes up over 90% of Masco's business, while the rest is a predominantly primer brand, Kilz. (Pschaidt, Tr. 966, 968). [REDACTED]

[REDACTED]
[REDACTED] } (Christian, Tr. 940-41) (*in camera*). [REDACTED]

[REDACTED]
[REDACTED] } (Pschaidt, Tr. 988-89 (*in camera*)). Masco explained

[REDACTED]
[REDACTED] } (Pschaidt, Tr. 1009) (*in camera*). Masco further

explained that it requires chloride TiO₂ for the majority of its products. (CCFF ¶¶ 39, 47, 49, 53-54, 64, 67-68, 72). The Proposed Finding is also misleading and incomplete with respect to [REDACTED]

[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED] } (Christian, Tr. 938-42 (*in camera*)). Footnote 43 to the Proposed

Finding is also misleading and incomplete. [REDACTED]
[REDACTED]

[REDACTED] } (Pschaidt, Tr.

991 (*in camera*)). Such a timeframe cannot be accurately characterized as ready substitution.

388. Barclays, an independent observer of the TiO₂ market, noted in 2016 that “there is enough fungibility between sulfate [and] chloride end-markets that a combined supply/demand is what impacts the economics.” (Turgeon, Tr. 2736; Shehadeh, Tr. 3536; RX0251).

Response to Proposed Finding No. 388

The Proposed Finding is misleading, incomplete, and not supported by the evidence cited. Barclays is a bank, not a participant in the TiO₂ market. In the report, Barclays acknowledged its statements regarding the fungibility between chloride TiO₂ and sulfate TiO₂ was disputed by market participants because high quality segments of the TiO₂ market would not be willing to switch to low quality Chinese sulfate TiO₂. (RX0251 at 0004). In fact, Barclays noted that one example of this is “Chinese exports [of sulfate TiO₂] are not going to replace a high-quality Western supplier in S[herwin-]W[illiams]’s North American architectural paint business.” (RX0251 at 0004). Despite Respondents’ characterization, the Barclays report supports the record evidence that North American customers would not turn to sulfate TiO₂ in place of chloride TiO₂. (CCFF ¶¶ 26-329). This is further demonstrated by the fact that chloride TiO₂ continually accounted for roughly 90% of sales in North America even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 46, 59, 111-33).

389. [REDACTED]

Response to Proposed Finding No. 389

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence. Mr. Christian explained that { [REDACTED] } (Christian, Tr. 839-40 (*in camera*)).

The record evidence is replete with examples of { [REDACTED] } (CCFF ¶¶ 94-101, 122; Malichky Tr. 616 (*in camera*); Christian, Tr. 839-40 (*in camera*)). The Proposed Finding fails to account for the record evidence showing that North American customers overwhelmingly purchase chloride TiO₂ because they demand the higher quality, brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers cannot readily switch to sulfate TiO₂, due to high costs, testing time and the need for in-store tinting. (CCFF ¶¶ 93-110). The Proposed Finding also fails to account for the fact that North American customers continue to pay higher prices for chloride TiO₂ rather than using sulfate TiO₂ as an extender/filler. (CCFF ¶¶ 111-33).

390. [REDACTED]

Response to Proposed Finding No. 390

The Proposed Finding is not supported by the evidence cited and contrary to the weight of the evidence. Mr. Christian did not make the statement found in the Proposed Finding. He stated that { [REDACTED] } (Christian, Tr. 839-41 (*in camera*)). The record evidence is replete with examples of North American customers overwhelmingly purchasing chloride TiO₂ because they demand the brightness, durability, and other performance attributes of chloride TiO₂, even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 46-133). To switch to sulfate TiO₂ merely because { [REDACTED] } (CCFF ¶ 124-25).

391. [REDACTED]

Response to Proposed Finding No. 391

The Proposed Finding is incomplete and contrary to the weight of the evidence. Mr. Christian explained that { [REDACTED] } (Christian, Tr. 839 (*in camera*)). Mr. Malichky confirmed this and explained that { [REDACTED] } (Malichky, Tr. 616 (*in camera*)). Rather, the record evidence is replete with examples from North American customers explaining how they continue to pay higher prices for chloride TiO₂ rather than using sulfate TiO₂ and did so during periods of high chloride TiO₂ prices. (CCFF ¶¶ 111-33).

392. [REDACTED]

Response to Proposed Finding No. 392

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence. Mr. Malichky explained that when TiO₂ prices doubled in 2011, { [REDACTED] } (Malichky, Tr. 398 (*in camera*)). However, { [REDACTED] } (Malichky, Tr. 398 (*in camera*)). Mr. Malichky further made clear that { [REDACTED] } (Malichky, Tr. 398, 615-16 (*in camera*)). Mr. Malichky explained that { [REDACTED] } (Malichky, Tr. 616 (*in camera*)).

393. [REDACTED]

Response to Proposed Finding No. 393

The Proposed Finding is incomplete and misleading. Mr. Christian explained that

{ [REDACTED]

[REDACTED] } (Christian, Tr. 839-41 (*in camera*)). { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX8003 at 002 (¶ 6) (Young Decl.) (*in camera*)). { [REDACTED]

[REDACTED]

[REDACTED] } (PX8003 at 002 (¶ 6) (Young Decl.) (*in camera*)). Moreover,

the record evidence is replete with examples from North American customers explaining how they continue to pay higher prices for chloride TiO₂ rather than using sulfate TiO₂ and did so during periods of high chloride TiO₂ prices. (CCFF ¶¶ 111-33).

394. [REDACTED]

Response to Proposed Finding No. 394

The Proposed Finding is incomplete and misleading. Mr. Christian explained that

{ [REDACTED]

[REDACTED] } (Christian, Tr. 839-41 (*in camera*)). For example, { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX8003 at 002 (¶ 6) (Young Decl.) (*in camera*)). { [REDACTED]

[REDACTED]

[REDACTED] } (PX8003 at 002 (¶ 6) (Young Decl.) (*in camera*)). { [REDACTED]

[REDACTED]

[REDACTED] } (PX8006 at 001 (¶ 6) (Pschaidt Decl.) (*in camera*)). [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] }

(PX8006 at 001 (¶ 6) (Pschaidt Decl.) (*in camera*)).

395. Customers undertake “the same” effort to reformulate from one chloride grade to another chloride grade of TiO₂ as they would need to undertake to reformulate from a chloride grade to a sulfate grade. (Mouland, Tr. 1225). [REDACTED]

Crucially, however, no customers testified that the qualification process for sulfate-process TiO₂ is any more time-consuming or difficult than that for chloride-process TiO₂. [REDACTED] tools of the TiO₂ trade, such as the Weatherometer, can reduce the testing process to merely 144 hours. (Engle, Tr. 2479-80).⁴⁴

Response to Proposed Finding No. 395

The Proposed Finding is misleading, not supported by the evidence cited, factually inaccurate, and contrary to the weight of the evidence. First, Mr. Mouland and Mr. Engle, as Tronox executives, are less knowledgeable than the customers regarding what efforts or processes *customers* must undertake to reformulate. Customers testified that reformulation is a high-cost, high-labor process. (CCFF ¶¶ 94-101). For example, it took Sherwin-Williams { [REDACTED] } [REDACTED]. (CCFF ¶ 100). Masco explained that for exterior formulations, qualification could take { [REDACTED] } because of { [REDACTED] } [REDACTED] } (CCFF ¶ 102).

⁴⁴ [REDACTED]

The Proposed Finding also fails to account for the fact that North American paint uses point-of-sale tinting—which introduces additional challenges and complications for reformulation. (CCFF ¶¶ 105-10). True value did, in fact, testify that “[REDACTED]” than substituting a chloride TiO₂ with another chloride TiO₂. (CCFF ¶ 98). Further, [REDACTED] (Pschaidt, Tr. 1012 (*in camera*)). Customers also testified that [REDACTED] (CCFF ¶¶ 99-101).

Footnote 44 to the Proposed Finding is irrelevant to determining product market as to how many TiO₂ products an individual customer purchases and misleading in that it suggests many universal grades are available to Sherwin-Williams. In fact, Sherwin-Williams explained that [REDACTED] (Young, Tr. 660 (*in camera*)). Additionally, Footnote 44 to the Proposed Finding is misleading as to the statement that there are “industry-wide resources and charts,” because Respondents did not cite to any industry-wide charts.

D. Chloride-Process TiO₂ Competes Directly Against Sulfate-Process TiO₂.

396. Tronox, which “is a chloride-only producer,” has to compete vigorously against sulfate companies in order to retain customers. (Turgeon, Tr. 2673-74). Tronox “[has] lost customer to people who have only sulfate plant.” (Turgeon, Tr. 2674). Tronox “had to compete with that sulfate.” (Turgeon, Tr. 2674).

Response to Proposed Finding No. 396

The Proposed Finding is misleading, and contrary to the evidence. The term “compete vigorously” is vague as to the significances of the purported competition. Mr. Turgeon does not specify if these instances are with North American customers. This lack of distinction is critical

because North American customers overwhelmingly purchase chloride TiO₂. (CCFF ¶¶ 46-133). Chloride TiO₂ continually accounts for roughly 90% of sales in North America even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 46, 59, 111-33). { [REDACTED]

[REDACTED] } (PX7002 (Mouland, IHT at 56-58) (*in camera*)).

397. [REDACTED] CR-826 is “one of [Tronox’s] biggest products worldwide. It is produced in every plant, and it’s a major coatings product for us.” (Engle, Tr. 2460).

Response to Proposed Finding No. 397

The Proposed Finding is misleading, incomplete and vague as to the terms “biggest products” and “head to head.” The Proposed Finding does not account for the evidence that North American customers overwhelmingly purchase chloride TiO₂ because they demand the high quality, brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers cannot readily switch to sulfate TiO₂, due to high costs, testing time and the need for in-store tinting. (CCFF ¶¶ 93-110). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33). Chloride TiO₂ continually accounted for roughly 90% of sales in North America even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 46, 59, 111-33). { [REDACTED]

[REDACTED] } (PX7002 (Mouland, IHT at 56, 58) (*in camera*)).

398. [REDACTED] The fact that Tronox competes with and loses customers to sulfate-only producers is real-world “proof that one can compete with the other.” (Turgeon, Tr. 2674).

Response to Proposed Finding No. 398

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. The Proposed Finding is also vague as to the term “lost business.” The Proposed Finding fails to account for North American customers’ demand for the high quality, brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33). { [REDACTED] } (CCFF ¶¶ 33, 35, 47, 55, 57, 66, 77, 88, 96, 106 ({ [REDACTED] }); CCFF ¶¶ 33, 36-38, 47, 51-52, 63, 70-71, 86, 89, 105 ({ [REDACTED] })).

399. [REDACTED]

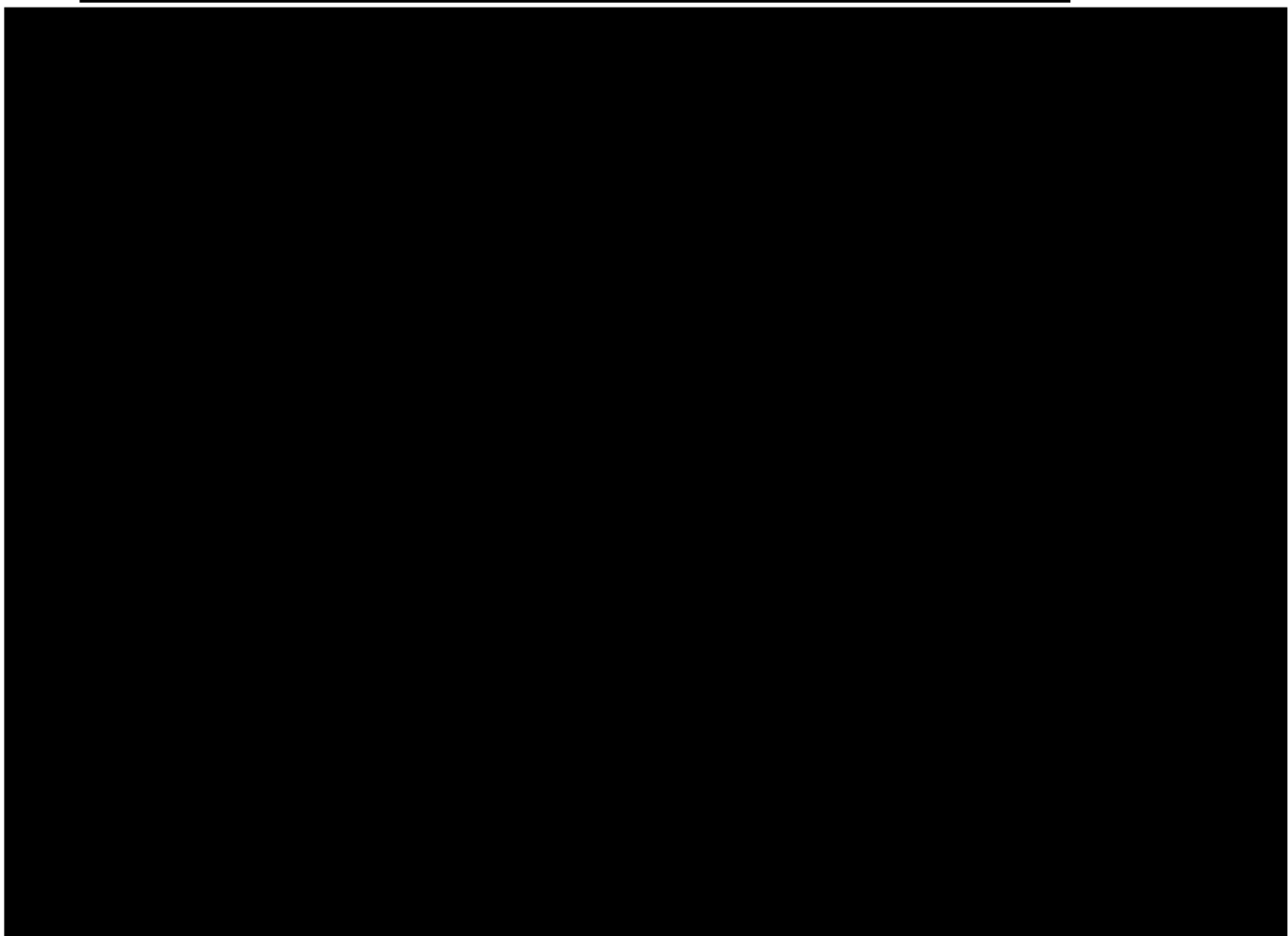
Response to Proposed Finding No. 399

The Proposed Finding is misleading and not supported by the evidence cited, as explained below and in CCRRFF ¶¶ 400, 403. Tronox’s own documents, including public disclosures, show that Tronox does not compete directly with Chinese TiO₂ in North America because Tronox is “selling to customers that have demand for [Tronox’s] higher-quality chloride product.” (CCFF ¶¶ 32, 204, 809.) Mr. Mouland is also responsible for sales in Latin America, and he has provided no context for whether he has used RX2005 or RX2006 in relation to North American sales.

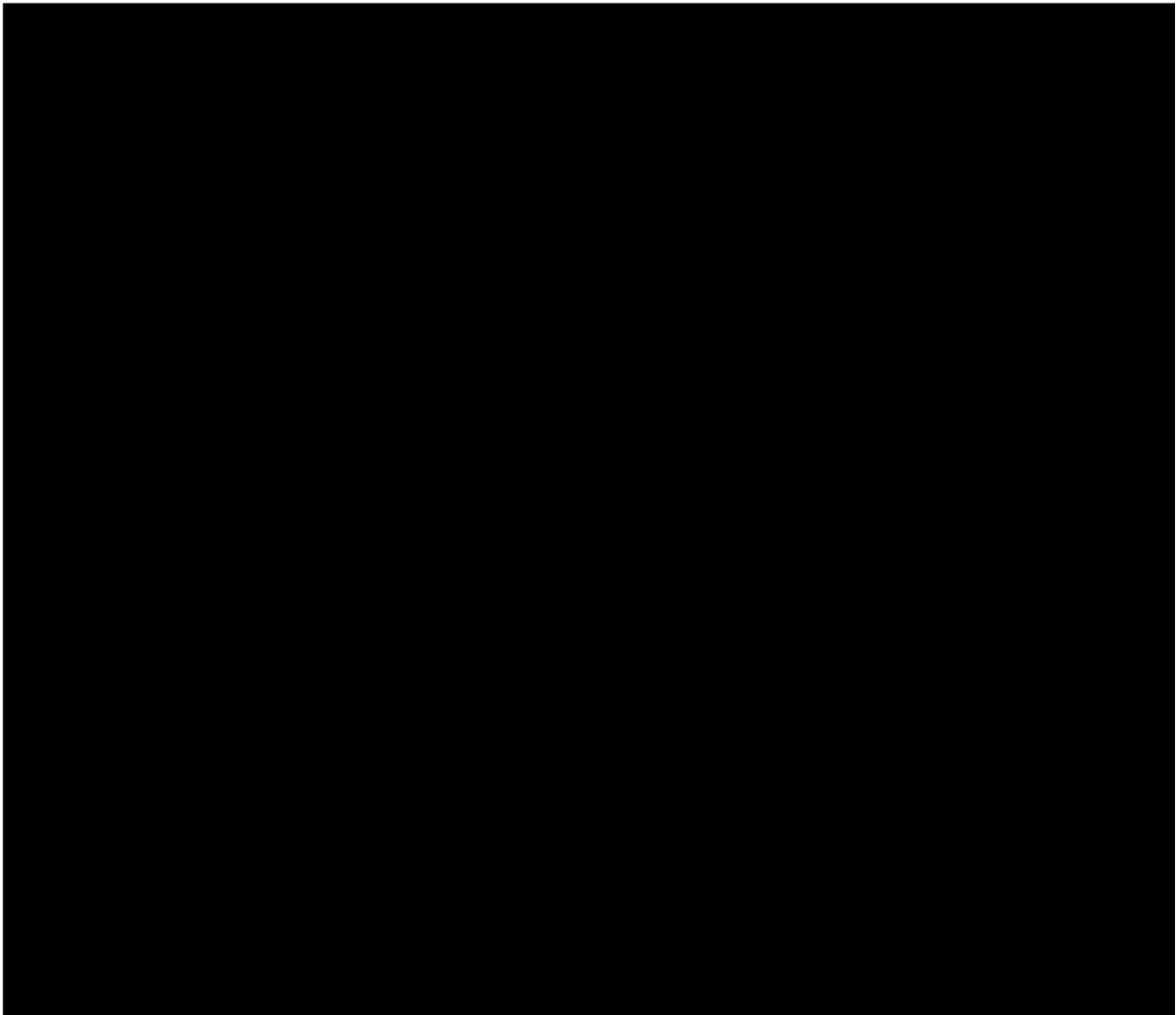
⁴⁵ Mr. Mouland, who oversees all of Tronox’s sales efforts in North America and South America, has worked at Tronox or its predecessor since 1998. (Mouland, Tr. 1141).

(Mouland, Tr. 1234-40). The record evidence from companies that actually use TiO₂ in their products shows that North American customers overwhelmingly purchase chloride TiO₂ because they demand the high quality, brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers cannot readily switch to sulfate TiO₂, due to high costs, testing time, and the need for in-store tinting. (CCFF ¶¶ 93-110). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33).

400. [REDACTED] RX2005 shows the Tronox chloride-process TiO₂ grades that compete with other Western producers' TiO₂ grades, including both chloride-process and sulfate-process TiO₂ grades. [REDACTED]



The Proposed Finding and RX2005 are misleading, incomplete, and contrary to the weight of the evidence. First, RX2005 does not provide any insight into products that compete in North America. This is clear because it includes grades that are not sold in North America or not sold for the same applications in North America. For example, { [REDACTED] } (RX2005 at 0001 (*in camera*)). However, { [REDACTED] } (PX0013 (Cristal Response to Second Request, Exhibit 3-3, TiO2 Pigment Customers) (*in camera*)). Additionally, { [REDACTED] } (RX2005 at 0001 (*in camera*)). However, this Venator grade is not sold in North America. (PX7015 (Maiter, Dep. at 160)). { [REDACTED] } (RX2005 at 0001 (*in camera*)). However, { [REDACTED] } (PX7035 (Christian, Dep at 158-59) (*in camera*)). In fact, { [REDACTED] } (PX8002 at 004 (Christian Decl.) (¶ 17) (*in camera*)). Additionally, there are mistakes on this chart that make it unreliable. For example, { [REDACTED] } (PX7015 (Maiter, Dep. at 85) (*in camera*)). However, on RX2005, { [REDACTED] } (RX2005 at 0001 (*in camera*)). Finally, { [REDACTED] }



Response to Proposed Finding No. 401

The Proposed Finding and RX2005 are misleading, incomplete, and contrary to the weight of the evidence for the reasons set forth in CCRFF ¶ 400.

402. [Redacted text block]

[REDACTED]

Response to Proposed Finding No. 402

The Proposed Finding and RX2005 are misleading, incomplete, and contrary to the weight of the evidence for the reasons set forth in CCRFF ¶ 400.

403.

[REDACTED]



Response to Proposed Finding No. 403

The Proposed Finding and RX2006 are misleading, incomplete, and contrary to the weight of the evidence. At the hearing, Respondents averred that RX2006, along with RX2005, were merely insignificant updates for PX1342 (which was already in evidence). (Mouland, Tr. 1230-32). However, PX1342 does not contain the chart found in RX2006. Rather, RX2006 is an entirely *new* chart, not otherwise provided to Complaint Counsel during the discovery period and only provided on the eve of Mr. Mouland's trial testimony. Additionally, this document is dated January 31, 2018 – *after* this litigation began. (RX2006 at 0001). Respondents' attempt to use a new document created during this litigation, should be rejected, especially as it conflicts with

documents and statements created in the ordinary course of business. (PX9085 at 007 (Horizontal Merger Guidelines, § 2.2.1) (“Documents created in the normal course are more probative than documents created as advocacy materials in merger review.”)). Moreover, it is clear that this document is unreliable to show { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX7002 (Mouland, Dep. at 100-101) ({ [REDACTED]

[REDACTED] }) (*in camera*). Even though Mr. Mouland { [REDACTED]

[REDACTED] } (Mouland, Tr. 1239 (*in camera*)), { [REDACTED]

[REDACTED] } At his deposition, { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (PX7002 (Mouland, Dep. at 104-07) (*in*

camera)). Rather, Tronox’s own documents, including public disclosures, show that Tronox does

not compete directly with Chinese TiO₂ in North America because Tronox is “selling to customers

that have demand for [Tronox’s] higher-quality chloride product.” (CCFF ¶¶ 32, 204, 809.)

RX2006 also fails address the specific needs of North American customers. North American

customers overwhelming purchase chloride TiO₂ because they demand the brightness, durability,

and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers

cannot readily switch to sulfate TiO₂, in part due to in-store tinting. (CCFF ¶¶ 93-110). Because

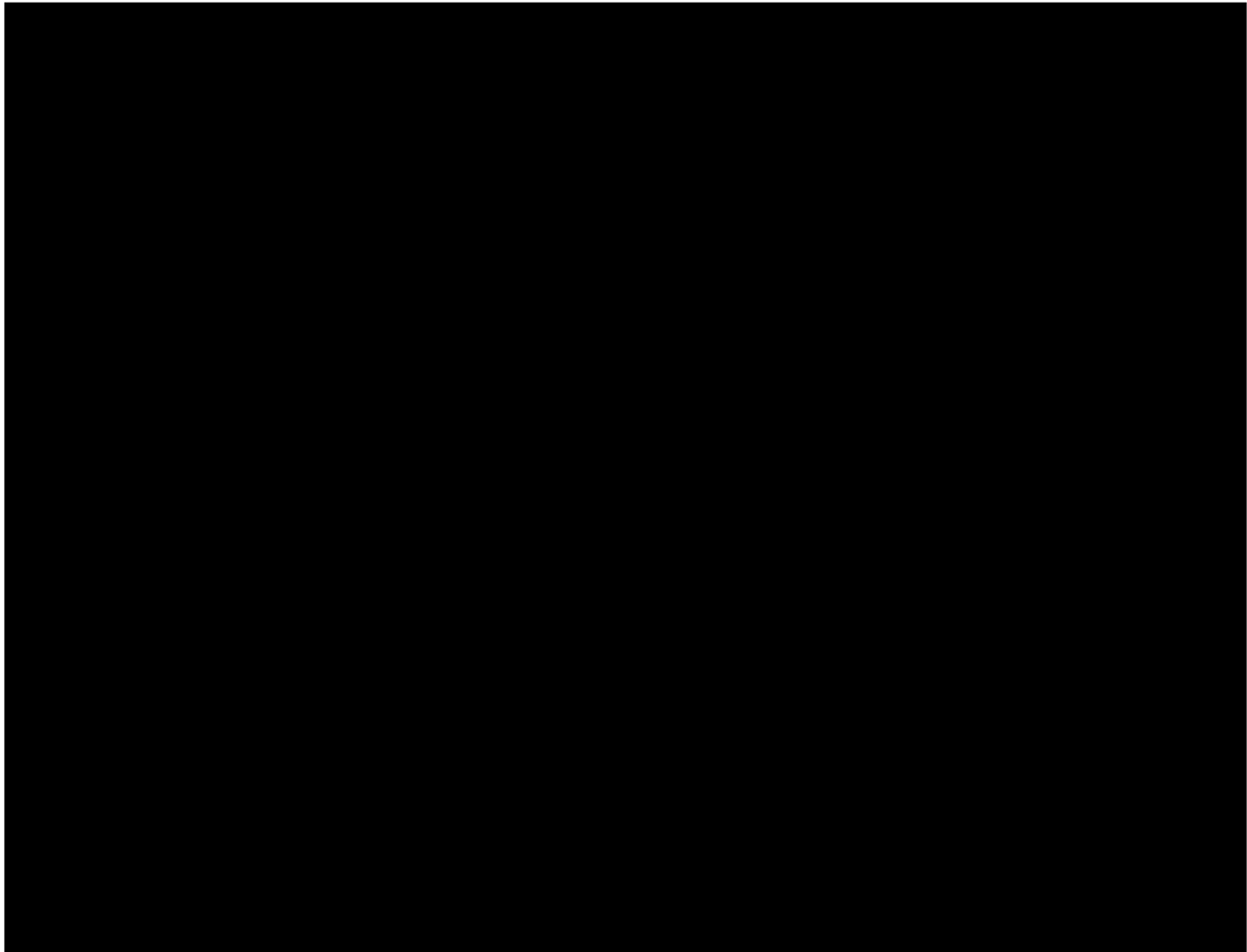
of these constraints, North American customers continue to purchase chloride TiO₂ even when it

is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33). In fact, Respondents admit

in their Post-Trial brief that the competition with Chinese TiO₂ producers is “*primarily in Asia.*” (Resp.’s Post-Trial Br. at 13 (emphasis added)). If the Court were to consider RX2006, it should be afforded little weight for the above reasons and because it is against the weight of the record evidence. (CCFF ¶¶ 745, 808-12).

404.

[REDACTED]



Response to Proposed Finding No. 404

The Proposed Finding and RX2006 are misleading, incomplete, and contrary to the weight of the evidence for the reasons set forth in CCRFF ¶ 403.

405. [Redacted]

Response to Proposed Finding No. 405

The Proposed Finding and RX2006 are misleading, incomplete, and contrary to the weight of the evidence for the reasons set forth in CCRFF ¶ 403.

406. [Redacted]



Response to Proposed Finding No. 406

The Proposed Finding and RX2006 are misleading, incomplete, and contrary to the weight of the evidence for the reasons set forth in CCRRFF ¶ 403.

407. As reflected in both RX2005 and RX2006, Tronox sells TiO₂ by “specification” and for particular applications and subapplications. (Arndt, Tr. 1408; Mouland, Tr. 1236-37). As a result, “[r]egardless of which particular technology made that pigment, the pigment must meet the specification,” so chloride-process and sulfate-process grades compete with each other where they can both meet the same specifications. (Arndt, Tr. 1408).

Response to Proposed Finding No. 407

The Proposed Finding is misleading, contrary to the weight of the evidence, and not supported by the evidence cited. Mr. Mouland made no statement in the referenced pages related to “specification” and therefore his testimony does not support the Proposed Finding. The second quotation to Mr. Arndt’s testimony drew a sustained objection in part, and cannot be used as evidence. Moreover, Mr. Arndt is Tronox’s vice president of investor relations and does not have any responsibility in sales or customer relations. (PX7011 (Arndt, Dep. at 9, 12-13) (*in camera*)). Mr. Arndt has no decision-making authority or responsibility for customer requirements, Tronox’s sales, or production decisions. (PX7011 (Arndt, Dep. at 9, 12-13) (*in camera*)). Mr. Arndt *did not* say that both chloride TiO₂ and sulfate TiO₂ would satisfy a customer’s specifications, that he knows of instances where sulfate TiO₂ and chloride TiO₂ competed against each other, or that any

of his statements were related to North American customers. The record evidence is clear that for North American customers, sulfate TiO₂ would *not* meet their specifications and that sulfate TiO₂ is not a viable option for them. (CCFF ¶¶ 31-45, 47-92).

408. For this reason, Mr. Mouland does not even pay close attention to whether a customer or potential customer is using chloride-process or sulfate-process TiO₂ because “it doesn’t really matter”; from a competitive perspective, “whether they’re buying chloride or sulfate doesn’t make any difference.” (Mouland, Tr. 1225-26).

Response to Proposed Finding No. 408

The Proposed Finding is misleading, contrary to the weight of the evidence, and not supported by the evidence cited. Mr. Mouland’s testimony was that as the person “responsible for all the America”, he is looking at sales at “a much higher level” and does not particularly pay attention to the grades a customer uses. (Mouland, Tr. 1226). Mr. Mouland’s statement was directed to the nature of his position rather than the lack of difference between sulfate TiO₂ and chloride TiO₂. The record evidence is replete with examples of how TiO₂ producers, including Tronox, recognize that chloride TiO₂ is particularly important to service customers in North America. (CCFF ¶¶ 46, 59-61, 73-74, 81-84, 92, 94-95, 113-116). For example, North American customers overwhelmingly purchase chloride TiO₂ because they demand the brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers cannot readily switch to sulfate TiO₂, in part due to in-store tinting. (CCFF ¶¶ 93-110). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-133). In fact, Mr. Mouland admits that [REDACTED]. (Mouland, Tr. 1242-43).

409. Kronos manufactures TiO₂ “using both [sulfate and chloride] processes.”⁴⁷ (Christian, Tr. 751). Kronos manufacturers about 40 grades of TiO₂; “about half” are sulfate and “about half” are chloride. (Christian, Tr. 897-98). [REDACTED]

Response to Proposed Finding No. 409

The Proposed Finding is incomplete and misleading in that it provides information globally. In looking at Kronos’s production in North America, { [REDACTED] } (Christian, Tr. 815 ({ [REDACTED] } } (*in camera*)). Moreover, these numbers, and the number provided in the Proposed Finding, include sulfate anatase TiO₂, which Respondents admit is not at issue in this case. (Resp.’s Post-Trial Br. at 4, n.1). Footnote 47 to the Proposed Finding is also misleading in that Kronos’s sulfate TiO₂ plant in North America produces only sulfate anatase TiO₂. (Christian, Tr. 782).

410. Kronos’ sulfate grades “compete with some chloride grades.” (Christian, Tr. 898). For example:

- a. Kronos 2043 is a sulfate grade of TiO₂ sold by Kronos that is “marketed for its excellent opacity and coatings above critical pigment volume concentration” and “good dispersion rate,” which “makes it very economical in its use.” (Christian, Tr. 900-01).
- b. Kronos 2056 is a sulfate grade of TiO₂ sold by Kronos that is marketed for its “good exterior durability on coatings and plastics.” (Christian, Tr. 901-02).
- c. Kronos 2101 is a sulfate grade of TiO₂ sold by Kronos that is “suitable for architectural paint applications” and “plastics, primarily PVC.” Kronos 2101 “imparts a good brightness and a neutral tone,” and “develops good tinting strength and hiding power.” (Christian, Tr. 902-04).
- d. Kronos 2190 is an “important” and “high-volume grade” for Kronos. It is “a very large product from a volume perspective amongst our SP portfolio.” (Christian, Tr. 904). Kronos 2190 “competes with chloride grades.” (Christian, Tr. 906). It is “suitable for use in architectural paints in indoor and outdoor use,” “has a very high gloss,” “disperses readily,” has “outstanding hiding power and tinting strength,” and “imparts good outdoor durability” (i.e., “how well it can withstand the elements or withstand wiping or scrubbing”). Kronos 2190 is “highly economical in use.” (Christian, Tr. 904-06).

⁴⁷ In fact, Kronos manufactures sulfate-process TiO₂ in North America. (Christian, Tr. 752).

Response to Proposed Finding No. 410

The Proposed Finding is misleading and not supported by the evidence cited. Mr. Christian explained that { [REDACTED] } (PX8002 at 004 (Christian Decl.) (¶ 17) (*in camera*)).

- a. Mr. Christian testified that he is not familiar with Kronos 2043 and could not tell if the grade was sulfate or chloride. (Christian, Tr. 901). Additionally, there is no evidence that Kronos 2043 is sold or used in North America.
- b. There is no evidence that Kronos 2056 is sold or used in North America.
- c. Mr. Christian testified that he is not familiar with Kronos 2101 and could not tell if the grade was sulfate or chloride. (Christian, Tr. 902). Additionally, there is no evidence that Kronos 2101 is sold or used in North America.
- d. { [REDACTED] } (PX7035 (Christian, Dep at 158-59) (*in camera*); Christian Tr. 940 (*in camera*)).

411. [REDACTED]

Response to Proposed Finding No. 411

The Proposed Finding is misleading and incomplete, and Respondents' expert cannot be used to establish facts. Additionally, Mr. O'Sullivan at Chemours explained during his deposition { [REDACTED] } (PX7052 (O'Sullivan, Dep. at 117-18) (*in camera*)).

In fact, Mr. O'Sullivan stated that { [REDACTED] }

(PX7052 (O’Sullivan, Dep. at 118) (*in camera*)). Mr. O’Sullivan’s observations are matched by Mr. Christian, who stated that Kronos { [REDACTED] } (PX8002 at 004 (Christian Decl.) (¶ 17) (*in camera*)).

412. Tronox’s customer relationship management system (known as CRM”) includes references to “customers seeking additional substitution for sulfate from chloride,” which is “consistent with the rest of the economic evidence” indicating “the incentive and ability of customers to substitute between” chloride and sulfate rutile TiO₂. (Shehadeh, Tr. 3319-21).

Response to Proposed Finding No. 412

The Proposed Finding is misleading and not supported by the evidence cited. Respondents’ proposed finding should be disregarded by the Court because the assertion that Tronox’s customer relationship management system includes references to customers seeking substitution from chloride TiO₂ to sulfate TiO₂ is a factual proposition that should be established by fact witnesses or documents, not through expert testimony. (Court’s Order on Post-Trial Briefs; Tr. 3794:7-10). Additionally, Dr. Shehadeh does not provide any quantity to the references he saw, nor did he check the context for those references (for example, sulfate TiO₂ is predominately used in low-quality applications). (CCFF ¶¶ 31-45, 46-92). The record evidence indicates that there are few instances of North American customers switching to sulfate TiO₂ and those instances are restricted to low-end applications. (CCFF ¶¶ 31-45, 46-92). Dr. Shehadeh also fails to consider the evidence that North American customers overwhelmingly purchase chloride TiO₂ because they demand the brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers cannot readily switch to sulfate TiO₂, in part due to in-store tinting. (CCFF ¶¶ 93-110). Because of these constraints, North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33).

413. Chloride-process and sulfate-process TiO₂ also compete because customers regularly “leverage” sulfate-process TiO₂ prices in negotiations with suppliers over prices for chloride-process TiO₂. (Romano, Tr. 2241; Christian, Tr. 933-35; Turgeon, Tr. 2675). [REDACTED]

Response to Proposed Finding No. 413

The Proposed Finding is misleading, not supported by the evidence, and contrary to the weight of the evidence. The citations to Mr. Christian’s testimony do not support the Proposed Finding. Mr. Christian explained that { [REDACTED]

[REDACTED] } (Christian, Tr. 935-36 (*in camera*)).

The reference to [REDACTED]

[REDACTED] } (Christian, Tr. 944-45 (*in camera*)). The record evidence provides several examples of { [REDACTED]

[REDACTED] } (CCFF ¶ 116). To the extent that other North American customers may attempt to, there is little evidence that this strategy is successful.

414. [REDACTED]

Response to Proposed Finding No. 414

The Proposed Finding is misleading, not supported by the evidence, and contrary to the weight of the evidence. Mr. Turgeon’s testimony failed to detail whether any lost business occurred with North American customers. Even the statements [REDACTED]

did not provide context as to whether those losses occurred in relation to the North American business. The record evidence is replete with examples that North American customers overwhelmingly purchase chloride TiO₂ because they demand the brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). The record evidence provides several examples of { [REDACTED] } (CCFF ¶ 116). To the extent that other North American customers may attempt to, there is little evidence that this strategy is successful.

415. [REDACTED]

Response to Proposed Finding No. 415

The Proposed Finding is misleading, not supported by the evidence, and contrary to the weight of the evidence. Mr. Christian explained that [REDACTED] (Christian, Tr. 935-36). This is because North American customers overwhelmingly purchase chloride TiO₂ because they demand the brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-133). Furthermore, Mr. Christian's testimony is that [REDACTED] (Christian, Tr. 930). [REDACTED] is in line with other examples in the record that [REDACTED] (CCFF ¶ 116). To the extent that other North American customers may attempt to, there is little evidence that this strategy is successful.

416. [REDACTED]



Response to Proposed Finding No. 416

The Proposed Finding is factually incorrect, misleading, not supported by the evidence, and contrary to the weight of the evidence. First, Behr is a brand name owned by Masco. (Pschaidt, Tr. 966). The example in this Proposed Finding is the *same* as the example presented in Proposed Finding No. 417. These should not be treated as two separate instances. Second, the citations to Mr. Christian’s testimony do not support the Proposed Finding. {



} (Christian, Tr. 944-45 (*in camera*)). {



.}

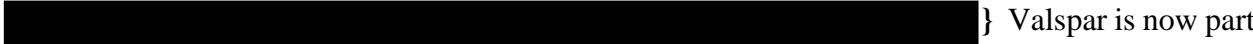
(Christian, Tr. 940 (*in camera*)). Masco explained that {



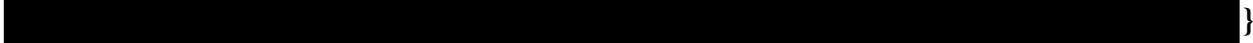
} (CCFF ¶¶ 39, 47, 53-54, 64, 72, 130). In the other example, Mr. Christian’s testimony regarding {



} (Christian, Tr. 928-29 (*in camera*)). {



} Valspar is now part of Sherwin-Williams, and {



(Young, Tr. 633, 736 ({ [REDACTED] }) (*in camera*)) Sherwin-Williams also clearly explained that it { [REDACTED] } (CCFF ¶¶ 36-38, 47, 51-52, 63, 66, 71, 86, 89).

417. [REDACTED]

Response to Proposed Finding No. 417

The Proposed Finding is misleading, not supported by the evidence, and contrary to the weight of the evidence. First, the example in this Proposed Finding is the *same* as the example presented in Proposed Finding No. 416. These should not be treated as two separate instances. Second, the citations to Mr. Pschaidt’s testimony here and to Mr. Christian’s testimony in Proposed Finding No. 416 do not support this Proposed Finding. Mr. Pschaidt’s testimony was about { [REDACTED] } (Pschaidt, Tr. 1015 (*in camera*)). { [REDACTED] } (Christian, Tr. 944-45 (*in camera*)). { [REDACTED] } (Christian, Tr. 940 (*in camera*)). { [REDACTED] } (CCFF ¶¶ 39, 47, 53-54, 64, 72, 130).

418. [REDACTED]

Response to Proposed Finding No. 418

The Proposed Finding is misleading and incomplete because { [REDACTED] }
 [REDACTED]
 [REDACTED] } (Christian, Tr. 841 (*in camera*)). Mr. Christian explained that { [REDACTED] }
 (Christian, Tr. 841 (*in camera*)). In fact, several customers explained that they would consider accepting sulfate TiO₂ only if it meant that they could prevent shutting down the factory. (CCFF ¶ 50). The Proposed Finding is not probative in determining product market because the relevant antitrust question is not what customers will do in desperate situations, but rather a customer's ability and willingness to substitute in response to a small but significant price increase or corresponding non-price changes. (*See* PX9085 (Horizontal Merger Guidelines, §§ 4, 4.1.2.)).

E. Prices for Chloride- and Sulfate-Process TiO₂ Are Highly Correlated, Indicating They Are Part of a Single Product Market.

419. “[T]here is a long-term relationship between sulfate and chloride titanium dioxide prices,” which demonstrates that “the relevant market . . . is not limited to chloride-produced titanium dioxide . . . but also includes sulfate-produced rutile titanium dioxide.” (Shehadeh, Tr. 3289).

Response to Proposed Finding No. 419

The Proposed Finding is misleading and incomplete in that it cites to evidence that is unreliable. The statistical approaches that Dr. Shehadeh uses to analyze the relationship between prices, the correlation and cointegration of prices, unreliable for the purposes of antitrust market definition. (CCFF ¶¶ 353-59). Dr. Shehadeh's approaches are prone to error and rely on samples that are far too small. (CCFF ¶¶ 355-57). The Proposed Finding is also vague as to the word “long-term” because it does not specify what duration qualifies as “long-term.”

420. The prices of chloride-process and sulfate-process TiO₂ are closely correlated because TiO₂ customers not only “have the ability” to switch between chloride and sulfate TiO₂, but also do switch “in a way that maintains the co-movement of prices across [rutile] titanium dioxide irrespective of the manufacturing process.” (Shehadeh, Tr. 3316).

Response to Proposed Finding No. 420

The Proposed Finding is misleading in that it relies upon evidence that is unreliable and contrary to the weight of the evidence. Respondents’ proposed finding should be disregarded by the Court because the assertion that customers have the “ability” to switch between chloride and sulfate TiO₂ is a factual proposition that should be established by fact witnesses or documents, not through expert testimony. (Court’s Order on Post-Trial Briefs; Tr. 3794). Moreover, the statistical approaches that Dr. Shehadeh uses to analyze the relationship between prices, the correlation and cointegration of prices, unreliable for the purposes of antitrust market definition. (CCFF ¶¶ 353-59). Dr. Shehadeh’s approaches are prone to error and rely on samples that are far too small. (CCFF ¶¶ 355-57). Furthermore, Dr. Shehadeh asserts that customers *do* switch in a way that maintains the comovement of prices, but he provides no evidence that links the comovement of prices to customers switching between the two processes. The Proposed Finding is also misleading because the relevant antitrust question is not if a customer *can* make a product with either chloride TiO₂ or sulfate TiO₂ but whether customers *would* switch to sulfate TiO₂. (PX9085 (Horizontal Merger Guidelines, § 4); PX5002 at 012-13 (¶¶ 19-21) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). The record evidence from companies that actually use TiO₂ in their products shows that North American customers overwhelmingly purchase chloride TiO₂ because they demand the brightness, durability, and other performance attributes of chloride TiO₂. (CCFF ¶¶ 46-92). North American customers cannot readily switch to sulfate TiO₂, in part due to in-store tinting. (CCFF ¶¶ 93-110). Because of these constraints, North American customers

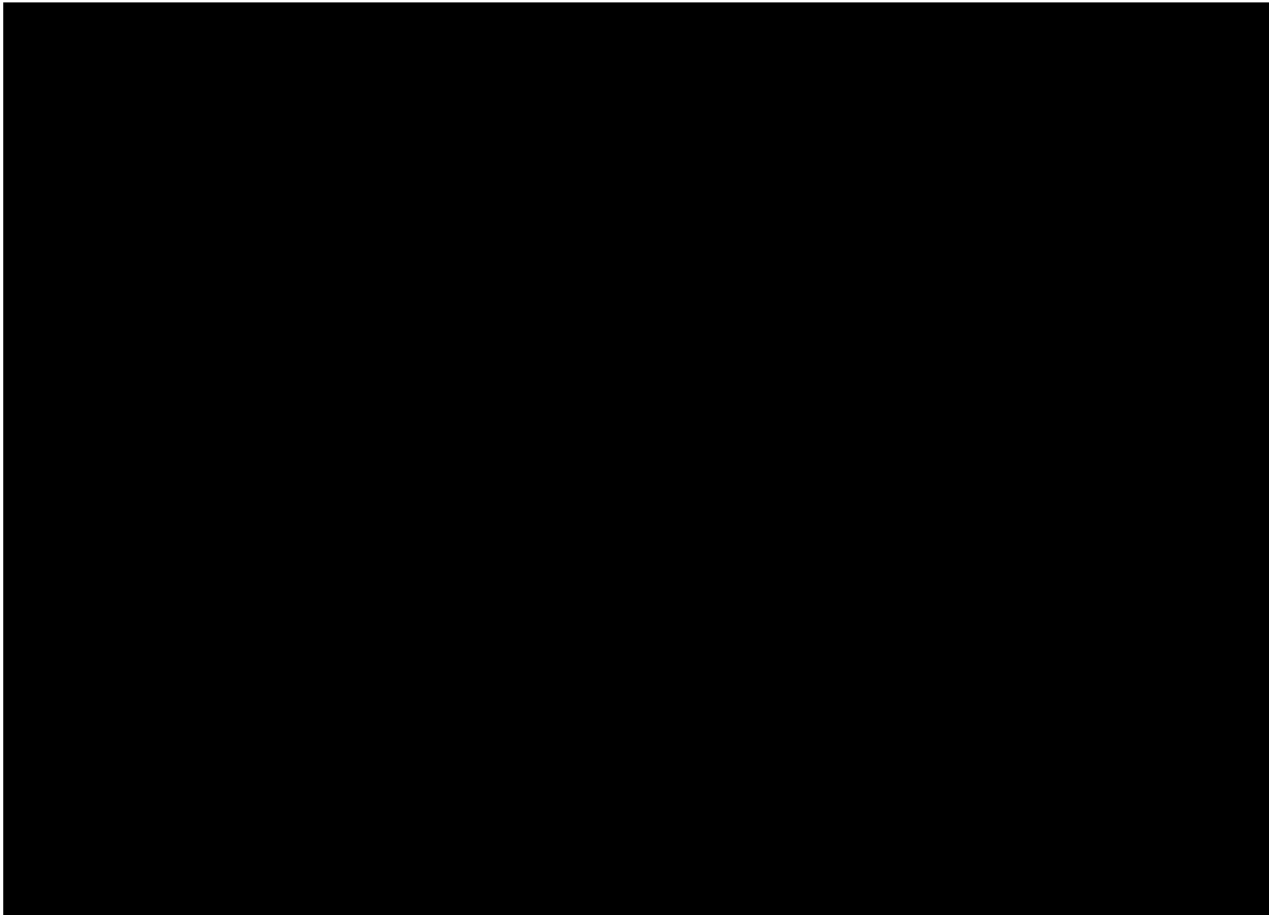
continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33).

421. To evaluate the co-movement of chloride and sulfate rutile TiO₂ prices, Dr. Shehadeh “reviewed pricing data . . . from a number of sellers,” “both in North America and globally, and compared those prices over time and for different geographies.” (Shehadeh, Tr. 3286). Dr. Shehadeh looked at TiO₂ prices for Cristal, Kronos, and Venator, because those are three major producers of TiO₂ who manufacture and sell both the chloride and sulfate processes. (Shehadeh, Tr. 3286-87).

Response to Proposed Finding No. 421

The Proposed Finding is misleading and incomplete in that it cites to evidence that is unreliable. The statistical approaches that Dr. Shehadeh uses to analyze the relationship between prices, the correlation and cointegration of prices, unreliable for the purposes of antitrust market definition. (CCFF ¶¶ 353-59). Dr. Shehadeh’s approaches are prone to error and rely on samples that are far too small. (CCFF ¶¶ 355-57). The evidence in the record shows that customers and suppliers treat sulfate TiO₂ and chloride TiO₂ as separate products. (CCFF ¶¶ 31-45.) Dr. Shehadeh’s analysis is counter to the weight of the record evidence, including Respondents’ own documents, which demonstrates that the TiO₂ producers do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22).

422. [REDACTED]



Response to Proposed Finding No. 422

The Proposed Finding is misleading and incomplete. The Proposed Finding and Shehadeh Figure 79 fail to specify what grades of products and end-uses are referenced. In Shehadeh Figure 79, there appears to be over a { [REDACTED] } price difference between chloride TiO₂ and sulfate TiO₂ at multiple points in time.

Moreover, the Proposed Finding and Shehadeh Figure 79 are vague and misleading because they only speak to global prices and do not distinguish between geographic regions. This lack of distinction is critical { [REDACTED]

[REDACTED] }
(CCFF ¶ 113, *see also* CCFF ¶ 117). This practice reflects the reality that North American customers continue to purchase chloride TiO₂ even when it is significantly more expensive than sulfate TiO₂. (CCFF ¶¶ 111-33). The weight of the record evidence, including Respondents' own

documents, demonstrates that the TiO₂ producers do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22). To the extent the Proposed Finding suggest that the correlation of pricing indicates that sulfate TiO₂ and chloride TiO₂ are in the same product market, the correlation of prices is unreliable for purposes of antitrust market definition and prone to error. (CCFF ¶¶ 353-59).

423. [REDACTED]

Response to Proposed Finding No. 423

The Proposed Finding is misleading, incomplete, and contrary to the weight of the evidence for the reasons set forth in CCRFF 422.

424. [REDACTED]

Response to Proposed Finding No. 424

The Proposed Finding is misleading in that it cites to evidence that is unreliable. The comovement of prices is unreliable for purposes of antitrust market definition and prone to error (CCFF ¶¶ 353-59). Dr. Shehadeh's analysis is counter to the weight of the record evidence, including Respondents' own documents, which demonstrates that the TiO₂ producers do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22).

425. [REDACTED]



Response to Proposed Finding No. 425

The Proposed Finding is misleading and incomplete in that it cites to evidence that is unreliable. Shehadeh Figure 80 averages across all grades, customers, and end-uses, as well as averages across all units, regardless of production location and any additional shipping costs or duties the units may incur as a result. Of particular note, Venator does not produce any sulfate TiO₂ in North America, meaning that sulfate sales into North America are likely to incur higher shipping costs and duties. (CCFF ¶ 376). Further, Venator's sulfate TiO₂ sales in North America are { [REDACTED] }, thus making the Proposed Finding and Shehadeh Figure 80 unreliable. (PX5004 at 060-61 (¶ 156) (Hill Rebuttal Report to Shehadeh) (*in camera*)). To the extent the Proposed Finding suggest that the correlation of pricing indicates that sulfate TiO₂ and chloride TiO₂ are in the same product market,

the correlation of prices is unreliable for purposes of antitrust market definition and prone to error. (CCFF ¶¶ 353-59). Dr. Shehadeh's analysis is counter to the weight of the record evidence, including Respondents' own documents, which demonstrates that the TiO₂ producers do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22).

426. [REDACTED]

Response to Proposed Finding No. 426

The Proposed Finding is misleading and incomplete in that it cites to evidence that is unreliable. Shehadeh Figure 80 averages across all grades, customers, and end-uses, as well as averages across all units, regardless of production location and any additional shipping costs or duties the units may incur as a result. (RX0170 at 145). Of particular note, Venator does not produce any sulfate TiO₂ in North America, meaning that sulfate sales into North America are likely to incur higher shipping costs and duties. (CCFF ¶ 376). Further, Venator's sulfate sales in North America are { [REDACTED] }, thus making the Proposed Finding and Shehadeh Figure 80 unreliable. (PX5004 at 060-61 (¶ 156) (Hill Rebuttal Report to Shehadeh) (*in camera*)). Furthermore, the comovement of prices is unreliable for purposes of antitrust market definition and prone to error. (CCFF ¶¶ 353-59). Dr. Shehadeh's analysis is counter to the weight of the record evidence, including Respondents' own documents, which demonstrates that the TiO₂ producers do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22).

427. **Response to Proposed Finding No. 427**

The Proposed Finding is misleading and incomplete in that it cites to evidence that is unreliable. Consistent with Dr. Hill's analysis and the views of industry participants, Shehadeh Figure 81 shows that in most periods, there was a chloride price premium. (CCFF ¶¶ 111-33). Shehadeh Figure 81 averages across all grades, customers, and end-uses, as well as averages across all units, regardless of production location and any additional shipping costs or duties the units may incur as a result. To the extent the Proposed Finding suggest that the correlation of pricing indicates that sulfate TiO₂ and chloride TiO₂ are in the same product market, the correlation of prices is unreliable for purposes of antitrust market definition and prone to error. (CCFF ¶¶ 353-

59). Dr. Shehadeh's analysis is counter to the weight of the record evidence, including Respondents' own documents, which demonstrates that the TiO₂ producers do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22).

428

Response to Proposed Finding No. 428

The Proposed Finding is misleading and incomplete in that it cites evidence that is unreliable. In fact, Shehadeh Figure 81 shows gaps of more than { } between the sulfate TiO₂ and chloride TiO₂ prices. To the extent the Proposed Finding suggest that the comovement of pricing indicates that sulfate TiO₂ and chloride TiO₂ are in the same product market, the comovement of prices is unreliable for purposes of antitrust market definition and prone to error. (CCFF ¶¶ 353-59). Dr. Shehadeh's analysis is counter to the weight of the record evidence, including Respondents' own documents, which demonstrates that the TiO₂ producers do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22).

429. All of these price correlations between chloride-process and sulfate-process TiO₂ "show[] that the relevant market includes both chloride-produced and sulfate-produced titanium dioxide." (Shehadeh, Tr. 3288).

Response to Proposed Finding No. 429

The Proposed Finding is misleading and incomplete in that it cites to evidence that is unreliable. The comovement of prices is unreliable for purposes of antitrust market definition and prone to error. (CCFF ¶¶ 353-59). Dr. Shehadeh's analysis is counter to the weight of the record evidence, including Respondents' own documents, which demonstrates that the TiO₂ producers

do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22).

430. [REDACTED]

Response to Proposed Finding No. 430

The Proposed Finding is misleading, incomplete, not supported by the evidence cited in that it relies upon Dr. Shehadeh's testimony regarding facts, and contrary to the weight of the evidence. Dr. Shehadeh failed to present any data or evidence { [REDACTED] } (Shehadeh, Tr. 3457 (*in camera*)). The record evidence shows that, in fact, the Pori fire does not establish the market as Dr. Shehadeh alleges. First, the price increases in Europe { [REDACTED] } suggesting that there are differences in the market between these two regions, and that neither arbitrage nor substitution were sufficient to discipline those differences. (CCFF ¶¶ 633-34; PX5004 at 039-40 (¶¶ 90-91 & Fig. 17) (Hill Rebuttal Report to Shehadeh) (*in camera*)). This is further seen in Dr. Hill's testimony when he says, [REDACTED] } (Hill, Tr. 1822 (*in camera*)). Second, Tronox's own salesperson admitted to a customer that { [REDACTED] } (PX4181 at 014 (*in camera*)). Finally, comovement of prices is unreliable for purposes of antitrust market definition and prone to error. (CCFF ¶¶ 353-59).

431. [REDACTED]

Response to Proposed Finding No. 431

The Proposed Finding is factually incorrect and misleading. Dr. Hill explained that [REDACTED] [REDACTED] } (Hill, Tr. 2037 (*in camera*)). In fact, Dr. Hill clarified the point when he testified, stating, [REDACTED] [REDACTED] } (Hill, Tr. 2034 (*in camera*)). The Proposed Finding is also incomplete and misleading in that [REDACTED] [REDACTED] [REDACTED] } (Hill, Tr. 1822 (*in camera*)).

432. Dr. Shehadeh used statistical and economic methods to confirm the statistical co-movement of sulfate-process and chloride-process rutile TiO₂ prices and to rule out other possible causes of this co-movement. (Shehadeh, Tr. 3233). The methods used by Dr. Shehadeh have been described by FTC economists as “among the broadly applied techniques” for defining antitrust markets. (Shehadeh, Tr. 3233-35). This is true for both geographic and product markets. (Shehadeh, Tr. 3237-38).

Response to Proposed Finding No. 432

The Proposed Finding is misleading in that it cites to evidence that is unreliable and unsupported by the evidence cited. First, the statistical approaches that Dr. Shehadeh uses to analyze the relationship between prices, the correlation and cointegration of prices, unreliable for the purposes of antitrust market definition. (CCFF ¶¶ 353-59). Dr. Shehadeh’s approaches are prone to error and rely on samples that are far too small. (CCFF ¶¶ 355-57). Second, there is no evidence that FTC economists have ever described price comovement as a broadly applied technique for defining antitrust markets. (Shehadeh, Tr. 3234). The only paper Dr. Shehadeh cites as supportive of his methodologies is a single paper from 1993, and he could cite no academic

articles in the past 25 years supporting his methodology. (Shehadeh, Tr. 3598). Rather, the academic literature since 1993 has been highly critical of Dr. Shehadeh's methods. (PX5004 at 023-24 (¶¶ 51-53) (Hill Rebuttal Report to Shehadeh) (*in camera*)). Finally, Dr. Shehadeh's analysis is counter to the weight of the record evidence, including Respondents' own documents, which demonstrates that the TiO₂ customers and producers do not view chloride TiO₂ and sulfate TiO₂ as interchangeable. (CCFF ¶¶ 32, 40-46, 58-61, 73-74, 81-84, 92, 94-95, 108, 113-15, 119-22).

433. Using these methods, Dr. Shehadeh found a "statistically and economically significant" co-movement of sulfate and chloride rutile TiO₂ prices. (Shehadeh, Tr. 3288). This economic analysis "shows that the relevant market includes both chloride-produced and sulfate-produced titanium dioxide." (Shehadeh, Tr. 3288).

Response to Proposed Finding No. 433

The Proposed Finding is misleading in that it cites to evidence that is unreliable and unsupported by the evidence cited. The Proposed Finding is also vague as to the term "'statistically and economically significant' co-movement of sulfate and chloride rutile TiO₂ prices" (RFF 433) in that the statistical approaches that Dr. Shehadeh uses to analyze the relationship between prices, the correlation and cointegration of prices, unreliable for the purposes of antitrust market definition. (CCFF ¶¶ 353-59). Dr. Shehadeh's approaches are prone to error and rely on samples that are far too small. (CCFF ¶¶ 355-57). Second, the academic literature since 1993 has been highly critical of Dr. Shehadeh's methods. (PX5004 at 014-19 (¶¶ 25-39) (Hill Rebuttal Report to Shehadeh) (*in camera*)). For example, Dr. Shehadeh uses incomplete data in his calculations. (PX5004 at 017 (¶ 35) (Hill Rebuttal Report to Shehadeh) (*in camera*)). If the proper data were included, Dr. Shehadeh's results would show that imports were not increasing. (PX5004 at 017-18 (¶ 36 & Fig. 6) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

F. The Increased Proportion of Sulfate TiO₂ Imports into North America Shows the Incentive and Ability of Customers to Substitute.

434. The “proportion of imports” of sulfate TiO₂ into North America “has increased over time, over the last few years.” (Shehadeh, Tr. 3307-08). A “significant source” of the increased proportion of sulfate TiO₂ imports into North America over the last few years is China. (Shehadeh, Tr. 3308).

Response to Proposed Finding No. 434

The Proposed Finding is misleading and incomplete in that Dr. Shehadeh erred in his analysis. Specifically, Dr. Shehadeh makes numerous errors in his import calculations. (PX5004 at 014-19 (¶¶ 25-39) (Hill Rebuttal Report to Shehadeh) (*in camera*)). For example, Dr. Shehadeh uses incomplete data in his calculations. (PX5004 at 017 (¶ 35) (Hill Rebuttal Report to Shehadeh) (*in camera*)). If the proper data were included, Dr. Shehadeh’s results would show that imports have not increased. (PX5004 at 017-18 (¶ 36 & Fig. 6) (Hill Rebuttal Report to Shehadeh) (*in camera*)) This result aligns with the real-world evidence that demonstrates that customers have not turned to sulfate TiO₂ imports, including sulfate TiO₂ from China. (CCFF ¶¶ 111-33, 808-12). The Proposed Finding is also vague as to the word “significant” because it has no specific meaning and provides no context as to the significances of the purported competition.

435. This shift in the product mix of imports (i.e. the increased proportion of sulfate-process TiO₂ imports into North America relative to chloride-process TiO₂ imports into North America) indicates “the incentive and ability of customers to substitute to sulfate-produced titanium dioxide.” (Shehadeh, Tr. 3308).

Response to Proposed Finding No. 435

The Proposed Finding is misleading and incomplete in that Dr. Shehadeh erred in his analysis. Specifically, Dr. Shehadeh makes numerous errors in his import calculations. (PX5004 at 014-19 (¶¶ 25-39) (Hill Rebuttal Report to Shehadeh) (*in camera*)). For example, Dr. Shehadeh uses incomplete data in his calculations. (PX5004 at 017 (¶ 35) (Hill Rebuttal Report to Shehadeh) (*in camera*)). If the proper data were included, Dr. Shehadeh’s results would show that imports

were not increasing. (PX5004 at 017-18 (¶ 36 & Fig. 6) (Hill Rebuttal Report to Shehadeh) (*in camera*)). This result aligns with the real-world evidence that demonstrates that customers have not turned to sulfate TiO₂, including sulfate TiO₂ from China. (CCFF ¶¶ 111-33, 808-12). The Proposed Finding fails to provide analysis that the purported shift is due to the customers' incentive and ability to substitute sulfate TiO₂ rather than due to another reason. Second, the Proposed Finding fails to present any evidence of an "incentive... of customers to substitute to sulfate-produced titanium dioxide." (Shehadeh, Tr. 3308). Even if the mix of imports were correctly measured, Respondents have not provided any evidence linking this change in the mix of imports to any sort of incentive.

436. When customers of TiO₂ decide to "substitute outside of North America a source of supply, they consider . . . not only chloride-produced titanium dioxide but also sources of sulfate-produced titanium dioxide." (Shehadeh, Tr. 3285). Based on detailed data from a number of sources, "[o]ver time, patterns of trade showed that the imports of sulfate and chloride, the mix, . . . varied over time . . . ," demonstrating the ability and incentive of customers to substitute between chloride and sulfate-produced TiO₂. (Shehadeh, Tr. 3284-85).

Response to Proposed Finding No. 436

The Proposed Finding is misleading and incomplete in that Dr. Shehadeh erred in his analysis. Specifically, Dr. Shehadeh makes numerous errors in his import calculations. (PX5004 at 014-19 (¶¶ 25-39) (Hill Rebuttal Report to Shehadeh)). For example, Dr. Shehadeh uses incomplete data in his calculations. (PX5004 at 017 (¶ 35) (Hill Rebuttal Report to Shehadeh)). If the proper data were included, Dr. Shehadeh's results would show that imports were not increasing. (PX5004 at 017-18 (¶ 36 & Fig. 6) (Hill Rebuttal Report to Shehadeh)). This result aligns with the real-world evidence that demonstrates that customers have not turned to sulfate TiO₂, including sulfate TiO₂ from China. (CCFF ¶¶ 111-33, 808-12). Second, the Proposed Finding fails to present any evidence of an "incentive of customers to substitute between chloride and sulfate-produced TiO₂." Dr. Shehadeh's quote claimed that the mix of imports varied over

time, but makes no claim as to why that variation occurred or what incentives may or may not face customers. (Shehadeh, Tr. 3284-85).

G. Dr. Hill’s Product Market Analysis Artificially Limits the Ability and Incentive of Customers to Switch from Sulfate to Chloride.

437. Dr. Hill began his market definition by analyzing a market of sales of chloride-process TiO₂ in the United States and Canada. (Hill, Tr. 1669-70; Hill, Tr. 1676). Ultimately, Dr. Hill ended his market definition inquiry right where he started—concluding that the “most relevant market” is “the sale of chloride titanium dioxide in the U.S. and Canada.” (Hill, Tr. 1670). According to Dr. Hill, “[a]n important features of the capacity closure model is that it can also be applied to the world but for the merger.” (Hill, Tr. 2000-01; Shehadeh, Tr. 3335-36).

Response to Proposed Finding No. 437

The Proposed Finding is incomplete and misleading. Dr. Hill studied qualitative evidence that pointed to the sales of chloride TiO₂ in the United States and Canada being a candidate market. (Hill, Tr. 1669-70). He then conducted the hypothetical monopolist test, as prescribed by the Horizontal Merger Guidelines, which confirmed that his candidate market was a relevant antitrust market. (CCFF ¶ 25; Hill, Tr. 1669-71). Finally, reference to the capacity closure model is not relevant for defining the antitrust market. Rather, the capacity closure model is a tool for analyzing potential effects of the Proposed Transaction. (PX5000 at 085 (¶ 189) (Hill Initial Report)).

438. Dr. Hill’s product market definition analysis is “unreliable” because it “isn’t consistent with the real world.” (Shehadeh, Tr. 3202-03).⁴⁹ First, Dr. Hill’s analysis “understate[s] the responsiveness of substitution to sulfate-produced rutile titanium dioxide from chloride titanium dioxide.” (Shehadeh, Tr. 3285-86).

Response to Proposed Finding No. 438

The Proposed Finding is factually inaccurate, and contrary to the weight of the evidence. First, Dr. Shehadeh’s analysis excluded relevant data, which resulted in his erroneous conclusion

⁴⁹ Notably, Complaint Counsel’s theory in this case regarding the product market for TiO₂ cannot be reconciled with the FTC’s own past positions. When reviewing TiO₂ producer DuPont’s proposed acquisition of the TiO₂ division of Imperial Chemical Industries (“ICI”) in 1998, the FTC found direct competition between chloride- and sulfate-process TiO₂. In the merger review, the Commission found a single TiO₂ market that included both sulfate- and chloride-process TiO₂ and acknowledged the significant global trade in TiO₂. (RX1598).

that sulfate TiO₂ and chloride TiO₂ were substitutes. (PX5004 at 009-12 (¶¶ 8-18) (Hill Rebuttal Report to Shehadeh)). If Dr. Shehadeh has used the correct data, he would have realized that chloride TiO₂ and sulfate TiO₂ are distinct. (PX5004 at 012-13 (¶¶ 19-20 & Fig. 3) (Hill Rebuttal Report to Shehadeh)). Second, Dr. Hill's analysis is consistent with the record evidence, showing that North American customers view chloride TiO₂ as distinct from sulfate TiO₂. (CCFF ¶¶ 46-133). Footnote 49 to the Proposed Finding is irrelevant in that it refers to an article authored by people who at time the article was published were former employees of the FTC, discussing an unrelated transaction and misleading in that it incorrectly characterizes the Commission's analysis of the DuPont/ICI merger. The DuPont/ICI transaction was proposed more than 20 years ago, and Respondents point to no evidence to suggest that the market conditions today are comparable to the market conditions in 1998. The article does not say that the FTC found direct competition between sulfate and chloride TiO₂; it says only that ICI was trying to develop sulfate TiO₂ to compete with DuPont's chloride TiO₂. (RX1598 at 0013). Moreover, the Commission had similar concerns on competitive effects: that the proposed transaction would give DuPont "control over a very substantial percentage of the supply of TiO₂ for North American customers", that "the elimination of an important competitor like ICI could facilitate or increase the likelihood of coordinated behavior" and DuPont's remedy proposal "did not address the elimination of a competitor that stood in the way of coordinated behavior." (RX1598 at 0013). In the end, DuPont ultimately abandoned the transaction so the transaction was never litigated.

439. Second, Dr. Hill's product market definition analysis also suffers from "very similar" issues as those "in the geographic context."⁵⁰ (Shehadeh, Tr. 3298). Specifically, Dr. Hill's product market is "drawn too narrowly because of the constraints on substitution of

⁵⁰ These flaws in Dr. Hill's critical loss analysis are described in the geographic market context in ¶¶ 349-55, *supra*. This evidence against Dr. Hill's critical loss analysis is fully incorporated for the product market context here. (Shehadeh, Tr. 3298).

customers that are imposed [by Dr. Hill] in his analysis.” (Shehadeh, Tr. 3324). “[A]s a result, he inappropriately identifies a too narrow relevant product market.” (Shehadeh, Tr. 3286).

Response to Proposed Finding No. 439

The Proposed Finding is incomplete and misleading. Dr. Hill conducted four different hypothetical monopolist tests and the results of each test concluded that the relevant product was chloride TiO₂. (CCFF ¶¶ 323-29). In contrast, Dr. Shehadeh misapplied the hypothetical monopolist test, which results in his inaccurate criticism of Dr. Hill. (CCFF ¶¶ 360-63). Footnote 50 to the Proposed Finding is misleading, factually inaccurate, and contrary to the weight of the evidence as described in CCRRFF ¶¶ 349-55.

440. Dr. Hill’s implementation of the hypothetical monopolist test for product market suffers from the same flaws from his geographic market. (Shehadeh, Tr. 3285-86). Dr. Hill’s methods “understate the responsiveness of substitution to sulfate-produced rutile titanium dioxide from chloride titanium dioxide.” (Shehadeh, Tr. 3286). This defines the product market too narrowly “for the very similar reasons to what we saw in the context of his consideration of the responsiveness of imports to prices in North America,” i.e., he understates the responsiveness. (Shehadeh, Tr. 3285-86).

Response to Proposed Finding No. 440

The Proposed Finding is incomplete and misleading. Dr. Hill conducted four different hypothetical monopolist tests and the results of each test concluded that the relevant product was chloride TiO₂. (CCFF ¶¶ 323-29). Dr. Hill’s analysis is consistent with the record evidence, showing that North American customers view chloride TiO₂ as distinct from sulfate TiO₂. (CCFF ¶¶ 46-133). In contrast, Dr. Shehadeh misapplied the hypothetical monopolist test, which results in his inaccurate criticism of Dr. Hill. (CCFF ¶¶ 360-63). Dr. Shehadeh’s analysis excluded relevant data, which resulted in his erroneous conclusion that sulfate TiO₂ and chloride TiO₂ were substitutes. (PX5004 at 009-12 (¶¶ 8-18) (Hill Rebuttal Report to Shehadeh) (*in camera*)). If Dr. Shehadeh has used the correct data, he would have realized that chloride TiO₂ and sulfate TiO₂

are distinct. (PX5004 at 012-13 (¶¶ 19-20 & Fig. 3) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

441. Dr. Hill’s critical loss analysis for product market definition is further flawed because his “methods skew his result to understate the relationship” between the price of chloride TiO₂ in North America and price of chloride TiO₂ in North America. (Shehadeh, Tr. 3296-97). This error “skew[s] his result to draw a narrower [product] market than the economic evidence indicates is appropriate.” (Shehadeh, Tr. 3296-97).

Response to Proposed Finding No. 441

The Proposed Finding is misleading and factually inaccurate. Dr. Hill applied critical loss analysis to a North American rutile TiO₂ market and found that such a market also passes the hypothetical monopolist test. (CCFF ¶¶ 346-52). In contrast, Dr. Shehadeh’s analysis is flawed because he excluded relevant data, which resulted in his erroneous conclusion that sulfate TiO₂ and chloride TiO₂ were substitutes. (PX5004 at 009-12 (¶¶ 8-18) (Hill Rebuttal Report to Shehadeh) (*in camera*)). If Dr. Shehadeh has used the correct data, he would have realized that chloride TiO₂ and sulfate TiO₂ are distinct. (PX5004 at 012-13 (¶¶ 19-20 & Fig. 3) (Hill Rebuttal Report to Shehadeh) (*in camera*)). Moreover, the Proposed Finding is vague because it is not clear what Respondents mean by “‘the relationship’ between the price of *chloride TiO₂* in North America and price of *chloride TiO₂* in North America.” (emphasis added).

442. Dr. Hill “performed a critical loss analysis in order to implement [his] hypothetical monopolist test.” (Hill, Tr. 1907). Dr. Hill’s critical loss analysis has two stages: calculating the critical loss and calculating the predicted loss. (Hill, Tr. 1907). The “critical loss calculation calculates the percentage of sales that a hypothetical monopolist would have to lose to keep profit unchanged.” (Hill, Tr. 1908).

Response to Proposed Finding No. 442

The Proposed Finding is incomplete and misleading in that it fails to state that Dr. Hill performed three separate critical loss analyses and implemented the hypothetical monopolist tests in four different ways. (CCFF ¶ 327). In the first critical loss analysis, Dr. Hill used his estimate

of the price elasticity of demand, which measures North American customers' willingness to switch from chloride TiO₂ to sulfate TiO₂, to determine whether enough North American customers would switch to alternative product to defeat a SSNIP by the hypothetical monopolist. (PX5000 at 051 (¶ 113) (Hill Initial Report) (*in camera*)). Dr. Hill's estimate of the price elasticity of demand was [REDACTED] which means that, consistent with the qualitative evidence, the demand for chloride TiO₂ by North American customers was inelastic. (PX5000 at 051-52 (¶ 113) (Hill Initial Report) (*in camera*)). As a result, switching to other products by North American customers would prove inadequate to defeat a SSNIP, which shows that the sale of chloride TiO₂ to North American customers passes the hypothetical monopolist test. (PX5000 at 052 (¶ 114) (Hill Initial Report) (*in camera*)). For his second critical loss analysis, Dr. Hill predicted substitution indirectly—what he referred to as “the substitution components method”—by using data from Respondents' own flawed advocacy, to ascertain whether increased imports or repatriated exports (“net imports,” which is a supply response rather than the demand substitution that is the proper focus of market definition) responding to a SSNIP, combined with lost sales, would render the SSNIP unprofitable for the hypothetical monopolist. (PX5000 at 052-54 (¶¶ 115-20) (Hill Initial Report) (*in camera*)). Even using this data, which, as Dr. Hill explained, is biased strongly toward rejecting the candidate market, the estimated substitution would not render the SSNIP unprofitable, showing the robustness of the market defined as the sale of chloride TiO₂ to North American customers. (PX5000 at 053-54 (¶¶ 117, 120) (Hill Initial Report) (*in camera*)). Dr. Hill's third critical loss analysis used Tronox's own estimate of the maximum North American sulfate TiO₂ demand to determine whether a sufficient number of North American customers would switch to sulfate TiO₂ to defeat a SSNIP, and found that they would not. (CCFF ¶ 327). Dr. Hill's fourth implementation

of the hypothetical monopolist test did not use critical loss analysis but used the price elasticity of demand for chloride TiO₂ in North America. (CCFF ¶ 328).

The hypothetical monopolist test, implemented in four different ways, gave the same result in each implementation—that demand for chloride TiO₂ is strong and that North American customers will not substitute to sulfate TiO₂ in significant amounts in the face of a SSNIP. (CCFF ¶ 329).

443. As to the calculation of critical loss, the first stage of critical loss analysis, there are two inputs to Dr. Hill’s calculation: SSNIP and margin on lost sales. (Hill, Tr. 1908). To calculate the margin on lost sales, Dr. Hill summed up the costs for all chloride plants in North America “then calculate[] a weighted average of the marginal cost.” (Hill, Tr. 1910).

Response to Proposed Finding No. 443

The Proposed Finding is incomplete and misleading for the reasons provided in the response to Finding No. 442.

444. Dr. Hill’s critical loss analysis for product market definition is unreliable because “[t]he key part of the calculation of the critical loss” is internal cost and margin data that Dr. Hill himself testified was unreliable and that “he would not rely on.” (Shehadeh, Tr. 3295-96). To calculate the margin on lost sales, Dr. Hill summed up the costs for all chloride plants in North America “then calculate[] a weighted average of the marginal cost.” (Hill, Tr. 1910). The basis for Dr. Hill’s calculations on margin of lost sales was based on plant-level cost data from the 2016 TZMI Cost Study. (Hill, Tr. 1909-11; PX5000-050, n. 214; PX5000-145, ¶ 326).

At trial he confirmed that he was not willing to rely on “the TZMI data used in [his] capacity closure model to estimate internal costs” for Chemours, Kronos, and Venator because he does not have “any direct knowledge about how accurate it is.” (Hill, Tr. 2012-13⁵¹).

Response to Proposed Finding No. 444

⁵¹ In fact, when Dr. Hill testified that he was not willing to rely on the 2016 TZMI cost study for estimated internal costs at his deposition, he had simply forgot that he had “used the exact same 2016 TZMI cost study to estimate internal costs when calculating marginal cost calculations for [his] hypothetical monopolist test.” (Hill, Tr. 2016).

The Proposed Finding is incomplete and misleading. Dr. Hill stated { [REDACTED] } (PX7056 (Hill, Dep. at 180) (*in camera*)). Respondents have not provided any evidence that suggests Dr. Hill finds the data unreliable or that it is inappropriate for calculating the margin of lost sales or when viewed at the industry-average level more generally. Indeed, Respondents' expert Dr. Shehadeh also relied on TZMI data for certain purposes in his report.

445. Dr. Hill himself admitted that if his "calculations for the margin on lost sales are incorrect, then [his] critical loss calculation could be wrong." (Hill, Tr. 1909).

Response to Proposed Finding No. 445

The Proposed Finding is incomplete and misleading. Based on the calculations shown in Dr. Hill's report, even if the true margin were 14 percentage points higher than those calculated from the TZMI data, the hypothetical monopolist test would still pass every critical loss analysis Dr. Hill conducted, including the one using Respondents' own data. (PX5000 at 051-56 (Hill Initial Report) (*in camera*)). Moreover, Dr. Hill also performed a hypothetical monopolist test that was not reliant upon margin evidence to conclude that a firm in control of all chloride TiO₂ sales to North American customers would find it profit maximizing to impose a SSNIP. (PX5000 at 056-58 (¶¶ 123-29 & Fig. 23) (Hill Initial Report) (*in camera*)).

446. Dr. Hill further admitted that if his calculation of critical loss is incorrect, then his "implementation of a hypothetical monopolist test may be wrong." (Hill, Tr. 1907). Thus, Dr. Hill's calculation of critical loss for geographic market definition is "unreliable" because he uses data that he himself described as unreliable and something "that he is not willing to rely on." (Shehadeh, Tr. 3263).

Response to Proposed Finding No. 446

This finding is incomplete and misleading. First, Dr. Hill did not claim the data was unreliable for the purpose of performing a critical loss test, as explained in CCRRFF ¶ 444. Second,

Dr. Hill conducted three separate critical loss analyses and another implementation of the hypothetical monopolist test that did not rely on critical loss to ensure the robustness of his results. (CCFF ¶¶ 327-29). Additionally, as demonstrated in CCRRFF ¶ 445, Dr. Hill's critical loss analysis was very robust, even if the margins were substantially different.

447. In any event, Dr. Hill's critical loss calculation found that a SSNIP of 10 percent could be defeated if "15.4 percent or more" of chloride-process TiO₂ sales were lost through arbitrage, customers no longer buying any TiO₂ at all, or customers switching to sulfate-process TiO₂. (Hill, Tr. 1908). In the second stage of his critical loss analysis, Dr. Hill calculated a "predicted loss" for each of the losses from arbitrage, discontinued buying and switching. (Hill, Tr. 1907-08).

Response to Proposed Finding No. 447

Complaint Counsel has no specific response.

448. Dr. Hill sets predicted losses through arbitrage at zero. As Dr. Shehadeh explained, this was wrong because Dr. Hill "again, inappropriately restricts the substitution that customers consider" outside the candidate market of North America. (Shehadeh, Tr. 3264). Thus, Dr. Hill "doesn't account for the real-world substitution that we observe in the variation of the trade data over time and in the economics literature." (Shehadeh, Tr. 3280).

Response to Proposed Finding No. 448

The Proposed Finding is misleading and factually inaccurate. It is incorrect and misleading to say that Dr. Hill sets arbitrage at zero, because critical loss analysis does not distinguish between sources of loss, and thus there is no specific parameter for arbitrage in the critical loss calculations for Dr. Hill to set. (PX5000 at 051-56 (Hill Initial Report) (*in camera*)). Further, Dr. Hill correctly controlled for substitution in his critical loss analysis because he estimated the degree to which customers substitute away from chloride TiO₂ using real-world data. (PX5000 at 051-56 (Hill Initial Report) (*in camera*)).

449. 

Response to Proposed Finding No. 449

The Proposed Finding is incomplete and misleading. Dr. Hill performed calculations for both a North American chloride TiO₂ market and a North American rutile market. (CCFF ¶¶ 323-29 (North American chloride TiO₂ market), ¶¶ 346-52 (North American rutile TiO₂ market)). The ■ percent sales number refers only to Dr. Hill's calculations of rutile TiO₂ sales. (PX5000 at 137-39 (Hill Initial Report) (*in camera*)). The corresponding elasticity for chloride-process TiO₂, which is used in most of the critical loss analyses discussed in Respondents' Proposed Findings, was calculated separately. (PX5000 at 139-40 (Hill Initial Report) (*in camera*)).

450. To analyze the predicted switching to sulfate TiO₂, Dr. Hill relied on his regression analysis of substitution between chloride-process TiO₂ and sulfate-process TiO₂. Dr. Hill's analysis of substitution between chloride-process TiO₂ and sulfate-process TiO₂ is unsound because he "looks at just price levels [of chloride TiO₂ only] as opposed to relative prices" of chloride and sulfate TiO₂. This analysis is incorrect and unreliable because "the role of the SSNIP is to be a *relative* price increase." (Shehadeh, Tr. 3293 (emphasis added)). For example, Dr. Hill's use of a producer price index for his regression for product market definition "does not include sales of . . . titanium dioxide produced outside of the United States and sold to customers in North America." As a result, it "understate(s) the responsiveness of . . . substitution by customers to changes in price." (Shehadeh, Tr. 3298-99).

Response to Proposed Finding No. 450

The Proposed Finding is incomplete, misleading, and not supported by the evidence cited. First, Dr. Hill used Tronox's own estimate of how much sulfate could serve the North American market and found the market still passed the hypothetical monopolist test. (PX5000 at 055-56 (Hill Initial Report) (*in camera*)). This test did not rely on any price information. Second, the transcript passage referred to by the proposed finding is speaking specifically about a quote by former Tronox CEO Tom Casey (a quote that was never mentioned in Dr. Shehadeh's expert report) and does not mention Dr. Hill's regression analysis. (Shehadeh, Tr. at 3293-94 ("JUDGE CHAPPELL: Well, I notice, from what's on the screen, when your expert was responding in that answer, there was an objection from respondent that it was not in the report. I'm hearing the same

thing today. In the final briefing after trial, it will be worked out or pointed out.”)). To the extent that Dr. Shehadeh does criticize Dr. Hill for not including the sulfate TiO₂ price elsewhere, those criticisms are mistaken, as Dr. Shehadeh’s results are similar to Dr. Hill’s result after controlling for data errors and econometric issues. (Hill, Tr. 1788-89; PX5004 at 013-20 (Hill Rebuttal Report to Shehadeh) (*in camera*)). Finally, Dr. Shehadeh’s criticism of Dr. Hill’s use of the North American Producer Price Index is incorrect, as Dr. Hill found a similar substitution response using Dr. Shehadeh’s preferred measure of price. (CCFF ¶¶ 364-68). Dr. Hill’s analysis is consistent with the record evidence that North American customers do not consider sulfate TiO₂ a realistic substitute for chloride TiO₂. (CCFF ¶¶ 46-133).

451. Because Dr. Hill’s regression for product market definition “doesn’t include relative prices” between chloride and sulfate TiO₂, it therefore “can’t answer [the] question” of “if the price of chloride went up and the price of sulfate didn’t go up, what happens.” (Shehadeh, Tr. 3298-3301).

Response to Proposed Finding No. 451

This finding is incomplete and misleading. First, there is no regression for product market definition. The antitrust market is defined using the hypothetical monopolist test, as prescribed by the Horizontal Merger Guidelines. (CCFF ¶¶ 25, 142, 323-29). Second, the regression measuring demand for chloride TiO₂ in response to changes in the domestic price should not include both the price for chloride- and sulfate-produced TiO₂ due to a multicollinearity problem that would render the results unreliable. (Hill, Tr. 1788-89; PX5004 at 015-16 (Hill Rebuttal Report to Shehadeh)). Moreover, Dr. Hill showed that even ignoring the multicollinearity issues and including a sulfate price would not lead to a large enough demand elasticity to imply a wider product market. (PX5004 at 009-13 (¶¶ 8-20 & Fig. 1-3) (Hill Rebuttal Report to Shehadeh) (*in camera*)). Dr. Shehadeh only finds otherwise because he relied on a fundamentally flawed quantity variable that

omitted sales from multiple large producers. (PX5004 at 009-13 (¶¶ 8-20 & Fig. 1-3) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

VI. POST-MERGER MARKET CONCENTRATION IS TOO LOW TO RAISE THE PROSPECT OF ANTI-COMPETITIVE EFFECTS.

452. “The combined share of the postmerger Tronox and concentration overall would be too low to be consistent with either unilateral or coordinated competitive effects in the properly defined relevant market.” (Shehadeh, Tr. 3325).

Response to Proposed Finding No. 452

This Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The Proposed Finding is premised on Dr. Shehadeh’s market definition, but as described below in response to Proposed Finding 453, Respondents, through Dr. Shehadeh, have made fundamental errors in their approach to market definition in this case, and Proposed Finding 453 is inaccurate and contrary to the record.

The evidence shows that the merger would significantly increase concentration in an already concentrated market. (CCFF ¶¶ 374-97). The proposed acquisition is presumptively illegal because it would increase the HHI by over 700 points, to over 3,000. (PX5000 at 067-68 (¶¶ 152-53 & Fig. 25) (Hill Initial Report) (*in camera*); CCFF ¶ 393). Further, the overwhelming evidence in the record supports the conclusion that the Proposed Acquisition would eliminate substantial direct competition, (CCFF ¶¶ 695-703), and raises strong concerns about both coordinated effects, (CCFF ¶¶ 398-550), and unilateral effects. (CCFF ¶¶ 551-694; *see generally* CCFF ¶¶ 704-27) (projections by industry participants of reduced competition).

453. Under the properly defined geographic and product market (a global rutile⁵² TiO₂ market), the post-merger Herfindahl-Hirschman Index (“HHI”), a measure of market

⁵²

concentration, is “below 1500 and in fact below 1300 by any measure.” (Shehadeh, Tr. 3326). This is true for both Dr. Shehadeh’s and Dr. Hill’s data for the relevant market. (Shehadeh, Tr. 3326). The Merger Guidelines say that these levels of concentration “are unlikely to raise the prospect of anticompetitive effects.” (Shehadeh, Tr. 3325).

Response to Proposed Finding No. 453

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The evidence shows that the properly defined market is chloride TiO₂ sold to customers in North America. (CCFF ¶¶ 23-329). In the properly defined market, the post-merger HHI exceeds 3,000. (PX5000 at 067-68 (¶¶ 152-53 & Fig. 25) (Hill Initial Report) (*in camera*); CCFF ¶ 393). Under the merger guidelines, the proposed acquisition is presumptively illegal and is likely to enhance market power in the relevant market. (PX9085 at 022 (Horizontal Merger Guidelines, § 5.3); PX5000 at 068 (¶ 153) (Hill Initial Report) (*in camera*); CCFF ¶ 393).

454. “[E]ven these low levels of concentration and shares would overstate the competitive significance” of the transaction in the real world because “shares and concentration are a static measure of competition,” whereas the TiO₂ industry is characterized by the “dynamic nature of competition in demand for and supply of titanium dioxide.” (Shehadeh, Tr. 3327-28). Market shares “are just a snapshot” of a “dynamic” TiO₂ industry. (Shehadeh, Tr. 3327-28). The dynamic nature of the TiO₂ industry is manifest in “new capacity expansions, new plants coming online, high-cost capacity being driven out of the market, and . . . dynamic competition” between TiO₂ suppliers. (Shehadeh, Tr. 3328).

Response to Proposed Finding No. 454

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. There are only five major producers in the relevant market: Tronox, Cristal, Chemours, Kronos, and Venator. (CCFF ¶¶ 375-81). These chloride TiO₂ producers engage in mutually accommodating conduct in an effort to maintain market discipline and avoid triggering competitive responses. (CCFF ¶¶ 433-59). Moreover, capacity expansion from these producers

████████████████████ Anatase TiO₂ has a different crystal structure than rutile TiO₂, and is often used in specialty products, such as food and pharmaceuticals. (Christian, Tr. 781-82).

would be costly and time consuming, costing upwards of \$200 million and taking at least four to five years to complete. (CCFF ¶¶ 737-41). Outside the five major producers, other TiO₂ producers have de minimis sales of chloride TiO₂ in North America and are not rapid entrants. (CCFF ¶¶ 382-89). Furthermore, entry and expansion into the North American chloride market would not be timely, likely or sufficient to offset the anticompetitive effects of the merger. (CCFF ¶¶ 728-822).

Finally, the testimony of Dr. Shehadeh regarding “dynamic competition” among TiO₂ suppliers, and capacity expansion and closures, is vague and should be given little weight. He did not specify a time frame for his general description, nor did he identify particular expansions or closures. In regions such as China, where demand is growing rapidly, capacity expansion to keep up with increasing demand is not surprising. (CCFF ¶ 776; PX0011 at 036 (Tronox board of directors and committee meetings) (*in camera*) ({} [REDACTED] [REDACTED].”)); PX1193 at 001 (Keegel email) ({} [REDACTED] [REDACTED] [REDACTED]) (*in camera*); RX1198 at 0046 (TZMI presentation (Chinese “capacity changes from 2018-2021 are expected to net far less supply than is required to meet the additional demand.”)). Further, Dr. Shehadeh did not refer to, in his testimony or his report, which high cost capacity has purportedly been closed. In any event, however, Kronos in a recent investor presentation cited the capacity reductions as one of the “structural improvements” that would increase earnings, observing that TiO₂ capacity has been “permanently reduced with limited near-term ability to increase capacity”. (CCFF ¶ 583 (*citing* PX3011 at 038 (Kronos Investor Presentation)). For these reasons also, the Proposed Finding and Dr. Shehadeh’s vague testimony are misleading and contrary to the weight of the evidence.

455. Dr. Hill calculated market shares for two potential relevant markets: “the sales of rutile TiO₂ to customers in North America” and “the sales of chloride TiO₂ to customers in North

America.”⁵³ (Hill, Tr. 1919). Dr. Hill did not use or rely on any calculation of market shares or concentration for a worldwide market. (Hill, Tr. 1946). Dr. Hill calculates the HHI for his proposed North American chloride titanium dioxide market using “market share based on volume in metric tons of chloride TiO₂ sold to customers in the United States and Canada.” (Hill, Tr. 1919-20). Dr. Hill’s market shares are calculated based on “sales to North American customers,” not “total sales or capacity.” (Hill, Tr. 1927).

Response to Proposed Finding No. 455

The Proposed Finding is misleading and incomplete, failing to provide any description of the bases for Dr. Hill’s measurement of market shares. Dr. Hill examined public statements, documents and testimony and found that there are persistent price differences by region – including higher prices in recent years in North America. (PX5000 at 060-63 (¶¶138-43) (Hill Initial Report) (*in camera*)). Producers and independent industry observers typically define North America as including Canada and the United States, but not Mexico. (PX5000 at 024 (¶56) (Hill Initial Report) (*in camera*)). Additionally, competitive conditions for sales of titanium dioxide in Mexico differ from competitive conditions in the United States or Canada. (PX5000 at 024 (¶56) (Hill Initial Report) (*in camera*)). The evidence also indicated that arbitrage had not prevented regional price differences in the past and was expensive and impractical. (PX5000 at 063-67 (¶¶144-51) (Hill Initial Report) (*in camera*)).

Considering this evidence, Dr. Hill tested whether North America was an appropriate geographic market and found that it was. (PX5000 at 058-67 (¶¶ 130-51) (Hill Initial Report) (*in camera*)). Having found a relevant geographic market consistent with the documents and the data, Dr. Hill followed the instructions in the merger guidelines and did not run tests on broadly defined markets including “relatively distant product or geographic substitutes.” (PX9085 at 011

⁵³ Dr. Hill’s market share calculations for his proposed North American chloride titanium dioxide market “are not based on production capacity of chloride TiO₂ in North America.” (Hill, Tr. 1920). Dr. Hill’s market share calculations for his proposed North American rutile titanium dioxide market “are not based on overall production capacity for rutile TiO₂ in North America.” (Hill, Tr. 1921).

(Horizontal Merger Guidelines, § 4) (“Defining a market broadly to include relatively distant product or geographic substitutes can lead to misleading market shares.”)).

456. Dr. Hill’s market share calculations for his proposed North American chloride TiO₂ market “don’t consider global TiO₂ capacity available to serve North America.” (Hill, Tr. 1920). The same is true for Dr. Hill’s market share calculation for his proposed North American rutile TiO₂ market: they “don’t consider global capacity available to serve North American customers.” (Hill, Tr. 1921).

Response to Proposed Finding No. 456

The Proposed Finding is incomplete and misleading. Dr. Hill’s market share calculations includes all sales of chloride TiO₂ to North American customers independent of source, including chloride TiO₂ producers overseas, and those sales accounted for less than {█} of sales. (Hill, Tr. 1920-22; CCF ¶¶ 382-89). Further, he considered the competitive constraint provided by any firms that do not currently sell TiO₂ to North American customers but who “would very likely provide rapid supply responses with direct competitive impact in the event of a SSNIP,” since those firms are also considered market participants in Hill’s market share calculations because they are “rapid entrants.” (PX9085 at 018-19 (Horizontal Merger Guidelines, § 5.1)). As Dr. Hill testified, however, “the rapid entrant standard is not met by any of the possible entrants that Dr. Shehadeh cites.” (Hill, Tr. 1754; *see generally* CCF ¶¶ 382-89 (evidence that chloride TiO₂ producers outside North America are not rapid entrants))

Nevertheless, Respondents cite to Dr. Hill as testifying that he did not “consider” global TiO₂ capacity available to serve North America. But Respondents’ citations omit important portions of the actual exchanges that took place at trial:

Q. And in Figure 25, you calculate market share based on volume in metric tons of chloride TiO₂ sold to customers in the United States and Canada in 2016, right?

A. That is correct.

Q. And Tronox's market shares in Figure 25 are its sales of chloride TiO₂ in North America, right?

A. That is correct.

Q. And Cristal's share in Figure 25 are sales in North America in 2016 of TiO₂, right?

A. Yes.

Q. Now, your market shares in Figure 25 are not based on production capacity of chloride TiO₂ in North America, correct?

A. That is correct.

Q. And except for the specific volume of chloride TiO₂ that was actually sold to customers in the U.S. and Canada during 2016, your market shares in Figure 2 don't consider global TiO₂ capacity available to serve North America, correct?

A. *They do not consider -- they consider -- yes, it's just sales in North America in 2016.*

Q. So they do not consider -- Figure 25 market shares do not consider global TiO₂ capacity available to serve North America, right?

A. That is correct.

(Hill, Tr. 1919-20 (emphasis added)).

What is clear then, is that Dr. Hill was simply explaining in response to questions that his market share calculations reflected sales of chloride TiO₂ in North America – “yes, it’s just sales in North America in 2016” - or in the broader market, rutile TiO₂. By omitting from their citation the more detailed testimony, Respondents have mischaracterized the testimony and created a misleading impression that he did not consider the factors relating to the impact of chloride TiO₂ capacity outside of North America. And as the overwhelming evidence in the record establishes, the competitive impact in North America of chloride TiO₂ capacity overseas has been limited, and

can be expected to be limited for the foreseeable future. (CCFF ¶¶ 382-89, 747-807, 815-22). Indeed, Dr. Hill did examine the impact of overseas chloride TiO₂ capacity, and concluded that for an array of reasons it would not likely be available to serve customers in North America in response to a SSNIP. (CCFF ¶¶ 775-76, 796, 822 (*citing to Hill testimony regarding potential for increased chloride TiO₂ imports for North America*); PX5000 at 112-15 (¶¶ 258-65) (Hill Initial Report) (discussing low prospect of increased exports of chloride TiO₂ to North America). Dr. Hill's conclusions, unlike Dr. Shehadeh's, are consistent with the wide array of evidence in the record, such as third party testimony, ordinary course documents, and Tronox public disclosures, establishing that chloride and sulfate TiO₂ producers overseas is not sufficiently available for supply to constrain a SSNIP for chloride TiO₂ in North America. (CCFF ¶¶ 382-89, 745-812, 813-22).

457. Yet Dr. Hill admits that Chemours, Kronos, Venator, and Lomon Billions all produce titanium dioxide outside of North America. (Hill, Tr. 1925-26). And most sales of titanium dioxide by Chemours, Kronos, Venator, and Lomon Billions are outside of North America. (Hill, Tr. 1926).

Response to Proposed Finding No. 457

The Proposed Finding is vague, incomplete and misleading. Respondents provide no indication of what significance they place on the fact that Chemours, Kronos, Venator and Lomon Billions produce TiO₂ outside of North America. Any sales of chloride TiO₂ made by Chemours, Kronos, Venator, Lomon Billions, or any other producer located outside of North America to customers inside North America are considered in Dr. Hill's market share calculations. (CCFF ¶¶ 382-89; Hill, Tr. 1731-32). Further, what Respondents do not address is the array of reasons, including logistics and shipping costs, duties, quality, product differences, and intellectual property issues, that the firms that they have described do not export substantial quantities of TiO₂ to North

America, and would not likely in the foreseeable future in response to a SSNIP. (CCFF ¶¶ 646, 648, 731, 742, 794-807, 815-22).

The Proposed Finding, furthermore, suggests the fundamental error in the approach of Respondents, through Dr. Shehadeh, implying significance to the limited fact that these companies produce TiO₂ outside of North America, in the face of overwhelming evidence in the record of the reasons that exports of TiO₂ from overseas plants are limited. (CCFF ¶¶ 644-47, 794-807, 815-22). This is the precise mistake that the Horizontal Merger Guidelines caution against: “Defining a market broadly to include relatively distant product or geographic substitutes can lead to misleading market shares. This is because the competitive significance of distant substitutes is unlikely to be commensurate with their shares in a broad market.” (PX9085 at 011 (Horizontal Merger Guidelines, § 4)).

458. Dr. Hill admitted that “if market shares should be calculated based on global rutile TiO₂ capacity and not based on sales to North American customers, [he has] not analyzed whether this transaction is anticompetitive on a global basis.” (Hill, Tr. 1948). Dr. Hill further admitted that “[i]f the market shares are based on global chloride TiO₂ capacity, then [he has] not demonstrated that this transaction is anticompetitive in a global market.” (Hill, Tr. 1948).

Response to Proposed Finding No. 458

The Proposed Finding is incomplete and misleading. To the extent that the foundation for the Proposed Finding is Respondents measurement of market shares for global capacity for rutile or chloride TiO₂, such a broad measurement is of limited probative value. The evidence shows that the properly defined market is chloride TiO₂ sold to customers in North America. (CCFF ¶¶ 23-329; PX5000 at 040-58 (¶¶ 90-129) (Hill Initial Report) (*in camera*)). In the properly defined market, the post-merger HHI exceeds 3,000. (PX5000 at 067-68 (¶¶ 152-53 & Fig. 25) (Hill Initial Report) (*in camera*); CCFF ¶ 393). Under the merger guidelines, the proposed acquisition is presumptively illegal and is likely to enhance market power in the relevant market. (PX9085 at

022 (Horizontal Merger Guidelines, § 5.3); PX5000 at 068 (¶ 153) (Hill Initial Report) (*in camera*); CCF ¶ 393). As Dr. Hill described, furthermore, and what Respondents failed to disclose, is that measuring market shares and concentration in the basis of “global chloride TiO₂ capacity,” the Proposed Acquisition establishes a presumption of anticompetitive effects. (Hill, Tr. 1947-48).

The Proposed Finding also reflects the failure on the part of Respondents to recognize that the Horizontal Merger Guidelines caution that “[d]efining a market broadly to include relatively distant product or geographic substitutes can lead to misleading market shares. This is because the competitive significance of distant substitutes is unlikely to be commensurate with their shares in a broad market.” (PX9085 at 011 (Horizontal Merger Guidelines, §4.0). Having found a relevant market consistent with the documents and the data, Dr. Hill followed the instructions in the merger guidelines and did not run tests on broadly defined markets including “relatively distant product or geographic substitutes.” (PX9085 at 011 (Horizontal Merger Guidelines, § 4)).

459. If market shares are calculated based on global rutile capacities, Dr. Hill believes that the total HHI “would be lower” than the HHIs he calculated for his proposed North American markets. (Hill, Tr. 1946). Indeed, in a global market for rutile TiO₂, Cristal’s market share would be only 12.3 percent and Tronox’s market share would be only 7.8 percent—for a combined market share of 20.1 percent for the merged firm. (Hill, Tr. 1942).

Response to Proposed Finding No. 459

The Proposed Finding is incomplete and misleading. The overwhelming evidence establishes that the properly defined market is chloride TiO₂ sold to customers in North America. (CCFF ¶¶ 23-329; PX5000 at 040-58 (¶¶ 90-129) (Hill Initial Report) (*in camera*)). In the properly defined market, the post-merger HHI exceeds 3,000. (PX5000 at 067-68 (¶¶ 152-53 & Fig. 25) (Hill Initial Report) (*in camera*); CCF ¶ 393). Under the merger guidelines, the proposed acquisition is presumptively illegal and is likely to enhance market power in the relevant market.

(PX9085 at 022 (Horizontal Merger Guidelines, § 5.3); PX5000 at 068 (¶ 153) (Hill Initial Report) (*in camera*); CCF ¶ 393).

As described by Complaint Counsel, the Horizontal Merger Guidelines caution that “[d]efining a market broadly to include relatively distant product or geographic substitutes can lead to misleading market shares. This is because the competitive significance of distant substitutes is unlikely to be commensurate with their shares in a broad market.” (PX9085 at 011 (Horizontal Merger Guidelines, § 4)). Having found a relevant market consistent with the documents and the data, Dr. Hill followed the instructions in the merger guidelines and did not run tests on broadly defined markets including “relatively distant product or geographic substitutes.” (PX9085 at 011 (Horizontal Merger Guidelines, § 4)). Further, if indeed Respondents’ broad market came close to reflecting the real world, particularly in terms of numbers of market participants, it would be unlikely that industry participants, including Respondents themselves, would project that the Proposed Acquisition would reduce competition. (*See generally* CCF ¶¶ 704-27 (projections by industry participants of reduced competition)).

460. The Merger Guidelines state that calculation of market shares should be “based on the best available indicator of firms’ *future* competitive significance in the relevant market.” (PX9085-020 (emphasis added)). The Merger Guidelines explain that “in markets for homogeneous products, a firms’ competitive significance may derive principally from its ability and incentive to rapidly expand production in the relevant market in response to a price increase or output reduction by others in that market.” (PX9085-020). Dr. Hill agrees. (Hill, Tr. 1924). Dr. Hill admits that “chloride titanium dioxide is a homogenous product.” (Hill, Tr. 1922). Dr. Hill also “agree[s] with the Guidelines that firms that clearly possess the necessary assets to supply into the relevant market rapidly may also be rapid entrants.” (Hill, Tr. 1922; PX9085-019).

Response to Proposed Finding No. 460

The Proposed Finding is misleading and incomplete. While Dr. Hill does agree with the guidelines that “firms that clearly possess the necessary assets to supply into the relevant market may also be rapid entrants,” what he testified was that due to the use of the expansive word “may”

in the leading question, it was appropriate to answer yes, but he also clarified that such firms “may not” be rapid entrants (Hill, Tr. 1922-25). The evidence in this case shows that there are no rapid entrants in this market. (CCFF ¶¶ 813-22). The few chloride TiO₂ producers that are not already considered market participants in Dr. Hill’s model only constitute { }% of global chloride TiO₂ capacity, and include some of the highest cost producers in the world, such as Ishihara and KMML. (PX5000 at 020-21 (¶ 49 & Fig. 3) (Hill Initial Report) (*in camera*); CCFF ¶¶ 384-89). Customer-specific qualification process, which can take years, further precludes these firms from being rapid entrants. (CCFF ¶¶ 93-110; 382-89).

461. Yet Dr. Hill’s market shares are calculated based on sales to North American customers in a single year: 2016. (Hill, Tr. 1919-20). Dr. Hill also admitted that “a firm’s competitive significance may depend on its level of readily available capacity to serve the relevant market if that capacity is efficient enough to make such an expansion profitable.” (Hill, Tr. 1924-25; PX9085-020). Dr. Hill also agreed that “in such markets capacities or reserves may better reflect the future competitive significance of suppliers than revenues.” (Hill, Tr. 1925; PX9085-020).

Response to Proposed Finding No. 461

The Proposed Finding is misleading and incomplete. The Merger guidelines recognize that “[i]n most contexts, the Agencies measure each firm’s market share based on its actual or projected revenues in the relevant market. Revenues in the relevant market tend to be the best measure of attractiveness to customers, since they reflect the real-world ability of firms to surmount all of the obstacles necessary to offer products on terms and conditions that are attractive to customers.” (PX9085 at 020 (Horizontal Merger Guidelines, § 5.2)). Dr. Hill calculated market share using the most recent year for which a full year sales data was available, 2016.

Though measuring market share based on sales is the default, the Horizontal Merger Guidelines acknowledge that in certain special scenarios it may be more appropriate to measure market share based on capacity rather than sales. (PX9085 at 020 (Horizontal Merger Guidelines,

§ 5.2); Hill, Tr. at 1738-39 (*in camera*)). While Dr. Hill agrees that in some circumstances capacity may be a more appropriate measure of market share, he testified that doing so in this case would be inappropriate. (Hill, Tr. 1924-25; 1738-39 (*in camera*)). Dr. Hill testified that “you may deviate if you believe that some other measure, for example, capacity, is a better measure because a firm might bring to bear a significant amount of sales in response to a small change in price.” When asked if he thought that was likely to occur in this case, Dr. Hill responded, “I don’t believe that’s the case here, no.” (Hill, Tr. 1738-39 (*in camera*)). It was not Dr. Hill’s testimony here, not Dr. Shehadeh’s speculation (Respondents’ Proposed Findings ¶¶ 452-53), nor Respondents’ theoretical questions about which overseas competitors “may” have capacity available (Respondents’ Proposed Findings ¶¶ 460-61), that is consistent with the real world evidence about the prospect of competition from overseas producers of chloride TiO₂ or even sulfate TiO₂. (CCFF ¶¶ 745-807 (Chinese chloride TiO₂), 384-89 (rapid entry by other overseas chloride TiO₂ producers), 808-12 (Chinese sulfate TiO₂)).

462. [REDACTED]

Response to Proposed Finding No. 462

The Proposed Finding is factually inaccurate and misleading. Nowhere in this excerpt of the trial transcript, nor anywhere in the record does Dr. Hill take the position that divesting Cristal’s TiO₂ facilities in Ashtabula would effectively resolve the concerns regarding any anti-competitive effects of the transaction. Moreover, Respondents have never proposed a divestiture of the two Ashtabula facilities to Complaint Counsel, so no discovery has been taken with respect to such a divestiture, or any other divestiture.

VII. THE TIO₂ INDUSTRY IS DYNAMIC AND FIERCELY COMPETITIVE.

A. TiO₂ Producers Compete Vigorously in the Global Marketplace.

463. The TiO₂ industry is “a very competitive industry.” (Quinn, Tr. 2318-19). The market is “[v]ery competitive” on price.⁵⁴ (Christian, Tr. 887). There’s “really significant, large competitors that have very low cost basis. There are foreign competitors, primarily the Chinese competitors, that have a very low cost basis.” (Quinn, Tr. 2318-19; RX0236). The TiO₂ industry has always historically been a competitive industry. (Turgeon, Tr. 2610). Today, competition in the industry is “very, very fierce,” “owing to the low-cost positions of the two leaders in the industry.” (Arndt, Tr. 1422).

Response to Proposed Finding No. 463

The Proposed Finding is vague, incomplete and misleading. Respondents rely on subjective descriptions of the TiO₂ competitive environment that are not factual, and contain no time frame for which their description would apply. That omission is critical, because in today’s environment, the supply of TiO₂ is tight and prices are rising significantly. (Quinn, Tr. 2391-92; PX7014 (Quinn Dep., at 85-86) (*in camera*); PX9102 at 005 (Tronox’s selling prices increased 26% from Q4 2016 to Q4 2017)). According to customers, it is difficult to secure additional supply of chloride TiO₂ in North America. (Malichky, Tr. 289 (*in camera*); Pschaidt, Tr. 973-74); Arrowood, Tr. 1086). Although Respondents cite to Mr. Christian’s opinion that chloride TiO₂ in North America is competitive, they do not address his additional testimony that the proposed acquisition would lead to “less players in the industry” and reduced competition: “So what we were saying here is that the capacity constraints already existed at the time in the industry, and these potential -- and in some cases these consolidations that we were seeing -- we think further increase the likelihood that those constraints would be present for a longer period of time.” (Christian, Tr. 772 (discussing PX3011)).

Further, to the extent that the Proposed Finding implies that purported low-cost Chinese competitors are competitive constraints on North American sales of chloride TiO₂, it is contrary

⁵⁴ Mr. Christian agreed that “[f]iercely competitive . . . would probably be a good choice of words.” (Christian, Tr. 887).





to the weight of the evidence. (CCFF ¶¶ 745-812; *see* PX9001 at 009 (Tronox Q3 2016 Earnings Call) (“So the question for us is, do we confront China-produced supply in the market as a competitive alternative to our supply? And as I’ve said, we don’t. . . . [T]he kind of customers that will buy our high-quality pigments are not simultaneously looking at -- for the same supply need Chinese product.”); PX7037 (Pickett, Dep. at 58-59) (Cristal’s GM for Sales in the Americas [REDACTED] }) (*in camera*); PX9101 at 008 (Tronox Q4 2017 Earnings Call) (“Jeffrey N. Quinn: Yes, I think we’re seeing all the incremental expansion over the next 18 to 24 months, will really kind of just be soaked up by the incremental global growth. So we don’t see that, that incremental expansion will significantly change the current dynamics.”)

Finally, the description of the competitive environment is undermined by evidence that Tronox, for example, has over an extended period of time made regular decisions not to compete to make TiO₂ sales. (*See, e.g.* CCFF ¶ 530 (citing RX0271 at 0001-02 (Mouland/Duvekot email chain) [REDACTED] }) (emphasis added) (*in camera*)). This sort of commercial decision is inconsistent with the market that Respondents’ seek to describe as very competitive. (*See generally* CCFF ¶¶ 433-59, 527-34).

464. Competition in the TiO₂ industry is not limited to any particular geographic region. (Mouland, Tr. 1206). There are “good competitors” with “good grades that are fighting for business all the time in every region and part of the world.” (Mouland, Tr. 1206).

Response to Proposed Finding No. 464

The Proposed Finding is vague and incomplete. Respondents relies on vague and subjective descriptions of the TiO₂ competitive environment, and provides no time frame for which their description would apply. (CCRRFF ¶ 463). Further, the description of the competitive environment is undermined by evidence that Tronox, for example, has for years chosen not to compete to make TiO₂ sales. (*See, e.g.*, PX1292 at 001-02 (Mouland/Larson email chain)

(


)) (*in camera*). Those sorts of commercial decisions in which Tronox is not “fighting for business” are inconsistent with the market that Respondents’ described as very competitive. (*See generally* CCFE ¶¶ 433-59, 527-34).

465. Cristal manufactures TiO₂ through both the chloride and sulfate process, and Tronox manufactures TiO₂ through only the chloride process. (Mouland, Tr. 1209; Turgeon, Tr. 2673). Yet Tronox competes with Cristal everywhere in the world. (Mouland, Tr. 1209).

Response to Proposed Finding No. 465

The Proposed Finding is vague, incomplete and misleading to the extent that it implies that TiO₂ manufactured by Cristal via the sulfate process is a substitute for TiO₂ manufactured by Tronox via the chloride process. Mr. Mouland, in the testimony cited in Respondents’ Proposed Finding 465, did not make any statement about substitutability between Cristal sulfate grades and Tronox chloride grades in any region of the world. (Mouland, Tr. 1209). Additionally, there is no evidence of substitution between Cristal sulfate grades and Tronox chloride grades of TiO₂.

Cristal has 
. (CCFE ¶ 113, *citing* PX7043 (Gigou, Dep. at 23) (

[REDACTED] } (*in camera*). The overwhelming evidence in the record establishes that chloride and sulfate grades of TiO₂ are not substitutes in North America. (CCFF ¶ 26-132).

466. Tronox and Cristal's other major competitors are Chemours—which is the “800 pound gorilla” in the TiO₂ industry—Lomon Billions, Venator, and Kronos. (Mouland, Tr. 1206; Quinn, Tr. 2344). Chemours is Tronox's largest competitor. (Mouland, Tr. 1207). Chemours competes everywhere in the world. (Mouland, Tr. 1207). Chemours is about three times larger than Tronox and is differentiated from other competitors due to their low cost-position and their proprietary technology. (Mouland, Tr. 1207). Chemours produces TiO₂ through the chloride process only. (Mouland, Tr. 1207).

Response to Proposed Finding No. 466

The Proposed Finding is vague and relies on subjective characterizations, for example of Chemours (“800 pound gorilla,” “largest competitor”) and Lomon (“major” competitor). Further, Respondents have provided no basis for their statement comparing Chemours size relative to Tronox, for example, whether they are referring to capacity or sales, and how their statement applies to the different regions in which these companies compete. After the acquisition of Cristal, Tronox would have a share of sales slightly higher than Chemours in North America, and the combined firm would account for { [REDACTED] } of chloride TiO₂ sales. (CCFF ¶ 391). Finally, the references to Chemours being “differentiated” from other competitors due to “low cost-position” and “proprietary technology” are vague. Indeed, Tronox considers itself to be comparable to Chemours as a low cost producer. (CCFF ¶ 547).

467. Lomon Billions is a Chinese producer that produces both chloride and sulfate titanium dioxide. (Malichky, Tr. 316; Stern, Tr. 3783). Tronox competes with Lomon Billions everywhere in the world. (Mouland, Tr. 1209). Lomon Billions is significantly expanding its chloride capability in China, and targeting the North American market as a growth market for its exports. (Engle, Tr. 2498-99 (discussing RX1642)). Lomon Billions is “becoming a force to be reckoned with after the merger between” Lomon and Billions. (Mouland, Tr. 1209). They are “getting much bigger, and given recent comments” the company is “looking to be number one” in the world terms of production. (Mouland, Tr. 1209; Turgeon, Tr. 2667).

Response to Proposed Finding No. 467

The reference to Mr. Engle’s testimony regarding exports is inaccurate and does not support the Proposed Finding. Instead of testifying that Lomon Billions is “expanding its chloride capacity” and “targeting the North American market as a growth market for its exports,” Mr. Engle testified that he had read a Lomon Billions presentation that described their plans to increase chloride TiO₂ production capacity by 200,000 tons and that at some unspecified point in the future Lomon Billions may build capacity in a coastal region, and he “can only imagine that a location at coastal China means it's preparing for more exports.” (Engle, Tr. 2498-99). Contradicting to the speculation in the Proposed Finding, neither Mr. Engle nor the Lomon Billions presentation mentioned North America. (RX1642 at 0016). Further, Mr. Engle did not describe any firsthand knowledge of Lomon Billions’ expansion plans other than what he read in that Lomon Billions presentation, and potentially a previous press release or presentation. (Engle, Tr. 2498-99).

The statement that Lomon Billions is “becoming a force to be reckoned with” is vague opinion testimony of Mr. Mouland, and is not a reliable basis for a factual finding, and contradicts the ordinary course documents and testimony that detail the issues Lomon Billions had had in producing chloride TiO₂, including the continued low rates of capacity utilization. (CCFF ¶¶ 794-807). Balanced against this evidence, furthermore, the discussion by Mr. Mouland and Mr. Turgeon of Lomon Billions’ future strategic intent, let alone their future capabilities, is unreliable.

468. It is generally acknowledged that Chemours and Chinese producers, especially Lomon Billions, are the lowest-cost producers in the business. (Engle, Tr. 2493-94; Stern, Tr. 3783).

Response to Proposed Finding No. 468

Respondents’ citation to Mr. Stern should be disregarded by the Court because the assertion of what is generally acknowledged regarding Chemours and Chinese producers is a factual

proposition that should be established by fact witnesses or documents, not through expert testimony.

In addition, the Proposed Finding is vague and misleading, beginning with the reference to the “business,” which because of the reference to Chinese producers, appears to include all Chinese producers of sulfate and chloride TiO₂, including potentially producers of anatase grades of TiO₂. Further, the reference that Chinese producers are “generally acknowledged to be lowest-cost producers in the business” is inconsistent with the real world facts, including testimony from TiO₂ consumers and from Kronos, as well as testimony, internal documents, and public disclosures of Respondents that the TiO₂ “business” in North America does not include these Chinese producers of sulfate TiO₂. (CCFF ¶¶ 745-812; *see* PX9001 at 009 (Tronox Q3 2016 Earnings Call) (“So the question for us is, do we confront China-produced supply in the market as a competitive alternative to our supply? And as I’ve said, we don’t. . . . [T]he kind of customers that will buy our high-quality pigments are not simultaneously looking at -- for the same supply need Chinese product.”); PX7037 (Pickett, Dep. at 58-59) (Cristal’s GM for Sales in the Americas { [REDACTED] } (in camera); PX9101 at 008 (Q4 2017 Tronox Earnings Call) (“Jeffry N. Quinn: Yes, I think we’re seeing all the incremental expansion over the next 18 to 24 months, will really kind of just be soaked up by the incremental global growth. So we don’t see that, that incremental expansion will significantly change the current dynamics.”)). Neither PX9001 nor PX9101 were among the materials that Mr. Stern relied upon for his opinion.

Furthermore, according to Kronos, Chinese chloride TiO₂ producers are not the lowest cost producers, particularly on a variable cost basis. (CCFF ¶770). Mr. Christian’s testimony is

consistent with information from TZMI. (PX1663 at 81, 149, 133-53 (TZMI Presentation) (*in camera*)).

469. 

Response to Proposed Finding No. 469

The Proposed Finding is vague, incomplete, misleading, and contrary to the weight of the evidence. The chart makes general references to Chinese producers, but Respondents have failed to provide any information to discern what information is purportedly reported in the Figure 15 chart. Without knowing what producers are included, such as whether the chart includes both chloride and sulfate TiO₂ producers (including producers of anatase grades of TiO₂, which Respondents admit are outside of the relevant market), the information in the chart cannot be considered reliable. In addition, it fails to account for the evidence that although at least at the time the chart was created some Chinese sulfate TiO₂ producers may have had low costs, Chinese

⁵⁵ A cost curve is a useful graphical way to explain the evolution of production costs as a function of capacity in any chemical business, certainly the TiO₂ business, beginning with the lowest cost plants and escalating to the highest cost plants. (Stern, Tr. 3784).

chloride TiO₂ producers did not. (CCFF ¶ 767-71). Further, the 2014 chart on its face does not account for the increasing costs of manufacture in China due to more recent increasing feedstock costs and stricter environmental regulations. (CCFF ¶ 771-74).

Further, the chart makes no representation about which producers make grades of TiO₂ that are sold in North America in competition with the chloride grades that Tronox and Cristal sell. But as the evidence demonstrates, Chinese producers of sulfate grades of TiO₂ are not competitive alternatives to chloride TiO₂ in North America. (CCFF ¶¶ 745-812; *see* PX8004 at 002-03 (¶ 9) (O’Sullivan Decl.) (

[REDACTED]

[REDACTED]

[REDACTED] } (*in camera*); PX7052 (O’Sullivan, Dep. at 174)

(

[REDACTED] } (*in camera*); PX9057 (Chemours Q3 2016 Earnings Call)

(describing how Chinese TiO₂ does not “intercept” Chemours chloride TiO₂ and “we aren’t seeing it affect our business today”).

470.

[REDACTED]

Response to Proposed Finding No. 470

The Proposed Finding is vague, incomplete and misleading for reasons described in Complaint Counsel’s response to Proposed Finding 469. The Proposed Finding did not describe whether the reports encompass only chloride TiO₂ manufacturers, or includes sulfate TiO₂ (including anatase grades) manufacturers as well. Mr. Stern’s testimony regarding what TZMI

has “recently indicated” is vague and unreliable. His testimony at the cited page refers to RX1319, and specifically to pages that include both sulfate and chloride plants. (Stern, Tr. 3786). To the extent that Mr. Stern’s testimony is based on inclusion of sulfate and chloride TiO₂ manufacturers in the tables that were in his report, it is for reasons described above in response to Proposed Finding 469 that this Proposed Finding is contrary to the weight of the evidence. RX1319 does compare manufacturing costs specifically for chloride plants, and the two Chinese manufacturers included in the table are Jinzhou and Billions, neither of which are low cost producers on an overall manufacturing cost basis. (RX1319 at 0080 (TZMI Pigment Producers Cost Study 2017 Presentation)). Further, Billions, as an example, has much higher operating costs than a plant such as Cristal’s Ashtabula 2 plant (*compare* RX 1319 at 0138 (Billions operating costs of \$1315 per ton) *to* RX1319 at 0134 (Ashtabula 2 operating costs of \$1133 per ton)).

471. Generally, Chinese producers are significantly concentrated on the left side of the TiO₂ industry cost-curve, indicating that they are significantly low-cost plants. (Stern, Tr. 3788). Two Chinese plants have the highest profitability in the industry, meaning, according to TZMI, they are the most profitable plants in the world. (Stern, Tr. 3786).

Response to Proposed Finding No. 471

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Respondents’ citation to Mr. Stern, who merely summarized what is in a TZMI report, should be disregarded by the Court because these assertions are factual propositions that should be established by fact witnesses or documents, not through expert testimony. Further, the report which Mr. Stern refers to in his testimony again contains both chloride and sulfate plants, a fact which he did not disclose in this part of testimony. (Stern, Tr. 3788 (*referring to* RX1319 at 0074)). The sulfate plants also include plants that make anatase grades of TiO₂, which even Respondents admit are not part of the relevant market.

Tronox itself in public disclosures has regularly concluded that sulfate TiO₂ from China is not competitive with Tronox chloride TiO₂. (CCFF ¶¶ 745, *citing* PX9001 at 009 (Tronox Q3 2016 Earnings Call) (“So the question for us is, do we confront China-produced supply in the market as a competitive alternative to our supply? And as I’ve said, we don’t. . . . [T]he kind of customers that will buy our high-quality pigments are not simultaneously looking at -- for the same supply need Chinese product.”); PX9006 at 006 (Tronox Q2 2015 Earnings Call) (“We do not see that exports from China or from Europe are playing a material role in the competitive balance, particularly in the North American market.”); PX9010 at 010 (Tronox Q2 2014 Earnings Call) (Chinese TiO₂ producers have thus far failed to establish themselves as a “material competitive presence, either in terms of volume or in terms of price. That implies to [Tronox] that it’s staying pretty much within the Chinese or the Asian market. I think a lot of supply generally from China generally tends to go into Latin America, then into the Middle East. It’s simply not a major force in our markets”)). Despite these statements, which Mr. Stern did not consider, Mr. Stern repeatedly relied on reports that include both sulfate and chloride producers in China, producers that Tronox has repeatedly declared are not competitive against its TiO₂ business. As a result, Mr. Stern’s testimony and the Proposed Finding are contrary to the weight of the evidence.

472. The dynamic nature of the TiO₂ industry is manifest in “new capacity expansions, new plants coming online, high-cost capacity being driven out of the market, and . . . dynamic competition” between TiO₂ suppliers. (Shehadeh, Tr. 3328). The majority of new capacity and construction in the TiO₂ industry is taking place in China. (Stern, Tr. 3774-75). Greenfield plants⁵⁶ are not being built in North America today, but they are being built in China. (Stern, Tr. 3774-75). It is less expensive to build greenfield plants in China than in the United States, for TiO₂ as well as for other chemical products; a fair estimate is that it is somewhere between 30 and 40 percent less expensive to build these plants in China than it is in the United States. (Stern, Tr. 3775).

Response to Proposed Finding No. 472

⁵⁶ A “greenfield” plant is brand-new construction. (Stern, Tr. 3774).

The Proposed Finding is vague, incomplete and misleading, and Respondents' citation to Mr. Stern, who described the addition of capacity in China, should be disregarded by the Court as citing to Mr. Stern for factual propositions that should be established by fact witnesses or documents, not through expert testimony. Not only did Mr. Stern make purely factual observations, his testimony is vague in several key respects.

First, he referred to TiO₂ plants and other chemical products, and then referred to it being 30 to 40 percent less expensive to build "these plants." It is uncertain whether the 30 to 40 percent less expensive refers to TiO₂ or just chemical products in general.

Further, he again does not distinguish between the cost of building chloride and sulfate plants, an important consideration not only for the reasons Complaint Counsel have otherwise described in detail in response to Proposed Findings 469-471, but because the recent closure of sulfate TiO₂ plants in China suggests that the asserted cost advantage is not accurate. (CCFF ¶ 779). In fact, he did not indicate whether the estimates he had seen were recent, an important omission due to the increasing environmental regulation of TiO₂ manufacture in China, which has increased the cost of manufacturing TiO₂. (CCFF ¶¶ 773, 781-83; Christian, Tr. 798-99 ("But then they also made the existing suppliers put in improved pieces of equipment, whether it's a desulfurization unit or some sort of environmental equipment that just adds cost to the product, but does not actually change the quality of the product, so their cost structure increases"))).

Dr. Shehadeh, in addition, provided vague testimony about the "dynamic nature of TiO₂ competition" relying for example on evidence of capacity expansions and closures. He did not specify a time frame for his general description, nor did he identify particular expansions or closures. In regions such as China, where demand is growing rapidly, capacity expansion to keep up with increasing demand is not surprising. (CCFF ¶ 776; see PX0011 at 036 (Tronox board of

directors and committee meetings) (*in camera*) ({});
 {});
 PX1193 at 001 (Keegel email) ({});
 {})) (*in camera*); RX1198 at 0046 (TZMI presentation)
 (Chinese “capacity changes from 2018-2021 are expected to net far less supply than is required to
 meet the additional demand”). Further, Dr. Shehadeh did not refer to, in his testimony or his
 report, which high cost capacity has purportedly been closed. In any event, however, Kronos in a
 recent investor presentation cited the capacity reductions as one of the “structural improvements”
 that would increase earnings, observing that TiO₂ capacity has been “permanently reduced with
 limited near-term opportunity to increase capacity.” (CCFF ¶ 583 (*citing* PX3011, at 038) The
 Proposed Finding and Dr. Shehadeh’s vague testimony are misleading and contrary to the weight
 of the evidence.

473. Lomon Billions has announced plans to expand its chloride capacity, and
 announced that they are building an additional 200,000 tons per year during the year 2019. (Engle,
 2498-99; Stern, Tr. 3781). Its current chloride plant has 100,000 tons of capacity, and is currently
 operating at about 70,000 tons per year. (Stern, Tr. 3781; Mouland; Tr. 1243;). {}
 {}

Response to Proposed Finding No. 473

The Proposed Finding is incomplete and misleading. As the evidence demonstrates, it
 remains highly uncertain whether Lomon Billions will expand and by how much and when, and
 whether such expansion will be able to keep pace with rapid demand growth in China and overall.
 (CCFF ¶¶ 795-807). Further, the cite to Mr. Pschaidt of Masco is misleading. Respondents fail
 to point out that Masco ({}
 {}). (Pschaidt,
 Tr. 988-89 (*in camera*)) They also failed to point out that ({}
 {})

[REDACTED]

[REDACTED] } (Pschaidt, Tr. 992 (*in camera*)). Further, the finding is also incomplete and misleading because Respondents fail to point out that according to TZMI, [REDACTED] is reported to be among the highest cost chloride TiO₂ producers in the world. (CCFF ¶ 768).

474. Tronox's competitor Venator manufactures TiO₂ through both the chloride and sulfate process. Venator's plants are mostly outside the United States. Tronox competes with Venator everywhere around the world. (Mouland, Tr. 1208).

Response to Proposed Finding No. 474

Respondents' Proposed Finding is incomplete, vague and therefore misleading. When stating that "Tronox competes with Venator everywhere around the world," Respondents, as they repeatedly have done, do not specify whether they are referring to competition with Venator in chloride or sulfate grades. The omission is particular important with respect to this Proposed Finding, due to the deposition testimony of Venator's Mr. Maiter that there are regional preferences in the use of chloride and sulfate grades. (PX7015 (Maiter, Dep. at 31-33, 126 (partially *in camera*))).

475. Tronox's competitor Kronos manufactures TiO₂ through both the chloride and sulfate process. The "majority of Kronos' TiO₂ facilities are located in Europe." (Christian, Tr. 859-60).⁵⁷ Tronox competes with Kronos everywhere around the world. (Mouland, Tr. 1208). Kronos ships product from each of its TiO₂ facilities "all over the world." (Christian, Tr. 861).

Response to Proposed Finding No. 475

The Proposed Finding is incomplete and misleading. In stating that "Tronox competes with Kronos everywhere across the world," it does not distinguish between chloride grades and sulfate grades. This omission is important taking into account Mr. Christian's testimony that

⁵⁷ Except for one TiO₂ plant in Canada and one TiO₂ plant in Louisiana in which it has a 50% ownership stake, all of Kronos' TiO₂ plants are in Europe. (Christian, Tr. 754).

sulfate grades and chloride grades are not reasonably interchangeable in North America. (CCFF ¶ 41; *see* Christian, Tr. 813-14 ([REDACTED] [REDACTED])) (*in camera*); Christian, Tr. 778-79, 897 (North American customers, therefore, have an “overwhelming preference” for chloride TiO₂ because it is needed to achieve the necessary product quality); CCFF ¶ 122). Further, Respondent’s reference to Kronos’s shipping patterns fails to disclose that [REDACTED] [REDACTED] (CCFF ¶¶ 389, 647). Kronos considers [REDACTED] [REDACTED] (CCFF ¶ 282).

476. In addition to its five primary competitors (Chemours, Lomon Billions, Cristal, Venator, and Kronos), Tronox competes with a number of other Chinese companies primarily in Asia, though they are “branching out” so the competition is becoming more global with them. (Mouland, Tr. 1210). Tronox also competes against a number of intermediate competitors globally; these other competitors are located in Eastern Europe, India (Kerala Minerals), and Japan (Ishihara). (Mouland, Tr. 1210).

Response to Proposed Finding No. 476

The Proposed Finding is vague and misleading, and contrary to the weight of the evidence. It is vague because it fails to distinguish between producers of chloride and sulfate grades, and further, the reference to Chinese companies that are “branching out” is vague and does not address any specific region. Further, the reference to companies against which Tronox competes “globally” also does not address any particular region, let alone North America. Tronox’s vague references to competing globally with Chinese competitors is squarely at odds with the overwhelming evidence that chloride TiO₂ customers in North America cannot effectively substitute to Chinese sulfate or chloride producers. (CCFF ¶¶ 26-133 (sulfate TiO₂ grades), 382-385 (small current presence of Chinese chloride TiO₂ in North America), 745-812 (potential entry by Chinese chloride TiO₂ unlikely in foreseeable future). Further, chloride TiO₂ customers in North America also cannot substitute to sulfate TiO₂ producers in Eastern Europe. (CCFF ¶¶ 26-

133). To the extent that Kerala Minerals and Ishihara sell chloride TiO₂ in North America, those very small are very small, and reflected in Complaint Counsel's measures of North American concentration. (CCFF ¶ 391, *citing* PX5000 at 067-68 (¶ 152 & Fig. 25) (Hill Initial Report). In any event Kerala and Ishihara are two of the highest cost TiO₂ producers in the world. (CCFF ¶¶ 387-88).

B. Chinese Producers, Especially Lomon Billions, Are a Major—and Growing—Competitive Threat.

477. “Chinese producers have transformed the global market, continuing to take market share from Western producers.” (Stern, Tr. 3704-05). Today, Tronox faces “significant competition from China in all world regions” (Quinn, Tr. 2348), and Chinese competition in the future is only going to get “more intense.” (Quinn, Tr. 2348; PX0010).

Response to Proposed Finding No. 477

The Proposed Finding is vague, misleading, and contrary to the weight of the evidence. Mr. Stern, who Respondents cite, has very little experience in the TiO₂ industry, (Stern, Tr. 3855-59 (describing how Mr. Stern has no experience related to use, marketing, distribution of manufacturing of TiO₂)), and lacks an adequate basis for his vague and conclusory testimony that “Chinese producers have transformed the global market.” In fact, his testimony is contrary to the weight of the evidence that the relevant geographic market is regional, and for purposes of assessing the acquisition, is limited to the sale of chloride TiO₂ to customers in North America, (CCFF ¶¶ 323-29), and is contrary to the overwhelming evidence, including the public disclosures of Tronox, that it does not compete with TiO₂ manufactured by Chinese producers, (CCFF ¶¶ 26-133 (sulfate TiO₂), 384-86 (minor competitive presence of Chinese TiO₂ in North America), 745-812 (substantial expansion by Chinese chloride TiO₂ in North America in foreseeable future). The testimony of Mr. Quinn is also vague, referring to an unspecified “future,” and contrary to the evidence. In fact, the overwhelming evidence shows, that a substantial amount of Chinese capacity has closed, that Chinese producers are facing increasing costs, and that Chinese expansion will not

significantly change current market dynamics, information which Tronox itself has emphasized to investors. (CCFF ¶ 782; *see generally* CCFF ¶¶ 775-88; PX9101 at 008 (Q4 2017 Tronox Earnings Call) (“Jeffrey N. Quinn: Yes, I think we’re seeing all the incremental expansion over the next 18 to 24 months, will really kind of just be soaked up by the incremental global growth. So we don’t see that, that incremental expansion will significantly change the current dynamics”)).

478. China is a “competitive threat” because “their growth is just incredible for the last few years.” (Engle, Tr. 2486). Furthermore, Chinese quality “has gotten so much better just over the last three or four years.” (Engle, Tr. 2486). Overall, “it gets better every day.” (Engle, Tr. 2488). Since 2015, the quality of Chinese TiO₂ product “has increased significantly.” (Arndt, Tr. 1411-12).

Response to Proposed Finding No. 478

This Proposed Finding is incomplete and vague and is contrary to the weight of the evidence that the quality of TiO₂ (sulfate or chloride) from China does not meet customer performance requirements, and therefore does not provide a competitive alternative to the chloride TiO₂ sold in North America. (CCFF ¶¶ 31-92, 746-54). Further, although Mr. Arndt may have testified that the quality of Chinese manufactured TiO₂ has increased since 2015, his testimony is contradicted by the public disclosures of Tronox, after 2015, relating to Chinese TiO₂. (CCFF ¶ 745 (citing PX9001 at 009 (Tronox Q3 2016 Earnings Call) (“So the question for us is, do we confront China-produced supply in the market as a competitive alternative to our supply. And as I’ve said, we don’t. . . . [T]he kind of customers that will buy our high-quality pigments are not simultaneously looking at for the same supply need Chinese product.”))). As Mr. Arndt testified, such public disclosures are accurate, so his inconsistent testimony about increased quality should be given little weight. (CCFF ¶ 462).

479. Although the TiO₂ industry has “always been very competitive,” it’s “worse” today “because of China.” (Turgeon, Tr. 2659).

Response to Proposed Finding No. 479

This Proposed Finding is vague and contrary to the weight of the evidence. It provides no factual basis for the vague and conclusory opinions that the TiO₂ industry has always been very competitive and that it is worse today because of China. Further, his testimony is contrary to repeated public disclosures in which Tronox has assured investors that Chinese manufactured TiO₂, particularly sulfate grades, are not competitive with Tronox grades. (CCFF ¶ 745). It is also contrary to Mr. Turgeon's own statements in September 2017 to a public RBC conference in which he described a "Favorable Industry Outlook" for Tronox because Chinese TiO₂ producers were facing increasing costs, environmental restrictions and feedstock issues. (CCFF ¶ 782; Turgeon, Tr. 2725 (discussing PX1438)).

480. Approximately 25 years ago, the TiO₂ industry in China was virtually nonexistent. (Turgeon, Tr. 2659-60). There was "no TiO₂ business in China." (Turgeon, Tr. 2660). But Chinese competitors, especially Lomon Billions, have "been very aggressive at growing their business in the last decade." (Turgeon, Tr. 2659-60⁵⁸). The increase in Chinese capacity and exports in recent years is "the most significant change" in the entire TiO₂ industry that Mr. Romano has observed in his 30 years of experience. (Romano, Tr. 2221).

Response to Proposed Finding No. 480

The Proposed Finding is incomplete, vague, misleading, and contrary to the weight of the evidence. Despite Mr. Turgeon's vague reference that Lomon Billions has been very aggressive, the weight of the evidence establishes that today they are not a significant competitive constraint on sales to North American customers. (CCFF ¶¶ 745-812). Further, demand for TiO₂ in China is expected to continue to grow at high rates, making increased exports of chloride TiO₂ from China less likely. (CCFF ¶¶ 776-77; *citing, e.g.*, RX1198 at 0046 (TZMI presentation) (Chinese

⁵⁸ Mr. Turgeon has first-hand knowledge of the changes in the TiO₂ industry, including the changes in China. (Turgeon, Tr. 2659-60). Mr. Turgeon has had the opportunity to travel to China numerous times during his employment with Rio Tinto and Tronox in the past 25 years to observe developments in the industry. (Turgeon, Tr. 2610). Mr. Turgeon has traveled to China on a regular basis as a part of his work in the TiO₂ industry throughout the past 25 years. (Turgeon, Tr. 2659-60).

“capacity changes from 2018-2021 are expected to net far less supply than is required to meet the additional demand.”). In addition, Mr. Romano’s testimony regarding various changes in the TiO₂ industry is vague and unspecific, and does not refer in any way to competition between any Chinese producer and Tronox in North America. Mr. Romano’s testimony is contradicted by the substantial record of evidence that Chinese TiO₂ producers are not significant competitive constraints to Tronox or other chloride TiO₂ producers in North America. (CCFF ¶ 26-133 (Chinese sulfate TiO₂), 384-386 (current sales of Chinese chloride TiO₂ in North America, 745-812 (entry of Chinese chloride TiO₂ producers). His vague testimony is also contradicted by the public disclosures by Tronox regarding competition from Chinese producers: “So the question for us is, do we confront China-produced supply in the market as a competitive alternative to our supply. And as I’ve said, we don’t. . . . [T]he kind of customers that will buy our high-quality pigments are not simultaneously looking at for the same supply need Chinese product.” (PX9001 at 009 (Tronox Q3 2016 Earnings Call)).

481. From 2008 to 2017, production capacity for TiO₂ in China has grown exponentially, essentially tripling over the nine-year period. (Stern, Tr. 3813-14; RX0171.0025). In total, Chinese production of TiO₂ went from about 800,000 tons ten years ago to roughly 3 million tons today. (Engle, Tr. 2486-87). Over the last ten years, “China has added about two million tons of capacity.” (Romano, Tr. 2221-22). Indeed, even over the past three years, “Chinese imports are considerably higher today than they were back in 2015 in all regions of the world.” (Arndt, Tr. 1411).

Response to Proposed Finding 481

The Proposed Finding is incomplete, misleading, and contrary to the weight of the evidence. Respondents’ citation to Mr. Stern, who described the addition of TiO₂ capacity in China, should be disregarded by the Court because it asserts factual propositions that should be established by fact witnesses or documents, not through expert testimony. Further, Figure 5 of his report, which he refers to in his cited testimony, is simply a regurgitation in the form of a chart,

of information (which itself may not be reliable) in a July 2016 article in Paints & Coating magazine. The testimony cited to in this finding is merely an explanation by Mr. Stern that his report contains Figure 5, and that Figure 5 refers generally to capacity to manufacture TiO₂ in China, not specifying whether it is chloride or sulfate. (Stern, Tr. 3813-14) Further, to the extent that Figure 5 does not distinguish between chloride and sulfate, it also does not specify whether the sulfate capacity is rutile or anatase TiO₂. To the extent that Figure 5 includes anatase TiO₂, it encompasses products that even Respondents admit are outside of the relevant market.

The reference to Mr. Engle's and Mr. Romano's testimony should be afforded little weight. By including both sulfate and chloride capacity, they sweep in production that is not relevant to the North American market for chloride TiO₂, including that sulfate capacity which is actually used to manufacture anatase grades that Respondents admit are outside the relevant market, and further, they fail to account for increasing demand for TiO₂ in China. (CCFF ¶ 776).

Further, Mr. Engle only generally referred to sources such as TZMI, and Mr. Romano did not refer to any sources. { [REDACTED]
[REDACTED]
[REDACTED] } (PX1000 at 016 (Tronox Strategic Foundations) (*in camera*); PX0004 at 039 (TZMI Presentation)). In addition some portion of the sulfate TiO₂ capacity that is included in this projection may be anatase TiO₂ capacity, which Respondents admit is outside of the relevant market. The reference to Mr. Arndt's testimony regarding increased Chinese exports does not specify chloride or sulfate exports (or further distinguish anatase grades), and based on the overall record, cannot be interpreted to imply an impact of these exports in North America or on Tronox. (*See, e.g.*, PX1395 at 008 (Arndt email) ("Chinese exports have indeed increased but the exports have largely stayed within Asia-

Pacific to serve low-grade sulfate pigment applications – applications that do not compete with our high-grade chloride pigment applications in the region.”)). In fact, imports of all TiO₂ into North America decreased substantially from 2016 to 2017. (CCFF ¶ 786).

482. The increasing Chinese production capacity has had an effect on the global TiO₂ market. (Stern, Tr. 3814). Ten years ago, China exported roughly 400,000 tons of TiO₂ per year and today exports about 1 million tons per year. (Engle, Tr. 2486-87).

Response to Proposed Finding No. 482

The Proposed Finding is vague, incomplete and misleading. The reference to an unspecified “effect” is an opinion that is subject to a wide range of interpretation, and the reference to a “global” market is contrary to the weight of the evidence that indicates that the relevant market in which to assess the effect of the acquisition is a North American market for sales of chloride TiO₂. (*See generally* CCFF ¶¶ 26-329 (findings in support of North American market for chloride TiO₂)). Furthermore, Mr. Stern has little, if any, experience in the TiO₂ industry, (Stern, Tr. 3855-59 (describing how Mr. Stern has no experience related to use, marketing, distribution of manufacturing of TiO₂), and his testimony about a speculative “effect,” is entitled to little weight, particularly in light of his decision not to consider evidence such as Tronox’s contrary statements on its own public earnings call statements. (CCFF ¶ 745). The reference by Mr. Engle to exports of Chinese TiO₂ also is vague – not specifying whether it is referring to sulfate TiO₂ exports (which may also include anatase TiO₂ which even Respondents exclude from the relevant market) or chloride TiO₂, or where such exports are being shipped to. The reference to exports from China also does not address regions, or address whether the exports are chloride TiO₂ or sulfate TiO₂ (and what portion of the sulfate TiO₂ are anatase grades that Respondents admit are outside of the relevant market). As described, there is substantial evidence in the record that Chinese manufactured TiO₂ does not have a “material competitive presence” as a current or potential

competitor to chloride TiO₂ sold in North America. (CCFF ¶¶ 26-133 (sulfate TiO₂), ¶¶ 384-86 (current sales of chloride TiO₂), ¶¶ 745-812 (potential entry of Chinese chloride TiO₂)).

483. The Chinese TiO₂ companies that are “big player[s]” in the global TiO₂ market are Lomon Billions, Bluestar, Xinli, and CNNC.⁵⁹ (Turgeon, Tr. 2661). These producers “export a lot of material, and their quality is as good as [Tronox’s] today.” (Turgeon, Tr. 2660-61). This change occurred within the last five or six years. (Turgeon, Tr. 2662). At that time, “none of them had good quality product,” “but as they’ve been refining their process, investing tremendous amount of money in R&D and combining their strength,” they have “improve[d] the quality” and “improve[d] the process.” (Turgeon, Tr. 2662).

Response to Proposed Finding No. 483

The Proposed Finding is vague and misleading in its references to “big players” and to a “global TiO₂ market.” The relevant market that is supported by the weight of the evidence – including customer testimony, Kronos, and the public disclosures of Tronox - is a North American TiO₂ market for chloride TiO₂. (CCFF ¶¶ 26-329). Further, Mr. Turgeon’s statements relating to Chinese quality being as good as Tronox’s, as a result of investing in R&D and improving their process, is contrary to the weight of the evidence. It is contradicted by customer testimony, Tronox internal documents, and Tronox public disclosures. (CCFF ¶¶ 384-86, 748-54; PX1033 at 002-03 (Tan email) (Xinli quality “poor” in October 2016)).

484. Today, Lomon Billions “is the number one producer in China,” “the number four producer in the world,” and “is bigger than Tronox.” (Turgeon, Tr. 2660). Lomon Billions continues to grow. (Turgeon, Tr. 2659-60; Romano, Tr. 2243-44; Engle, Tr. 2493). The merger that created Lomon Billions led to a significant “jump” in the quality of its TiO₂ pigment. (Turgeon, Tr. 2664).

Response to Proposed Finding No. 484

⁵⁹ The TiO₂ industry also includes “tier two” Chinese competitors who typically produce TiO₂ at one site. The Chinese government is encouraging them to increase their size and quality so that they become more relevant. Tier two companies have combined in the past to become tier one companies. One such example is the combination of Lomon and Billions. (Turgeon, Tr. 2661-63).

The Proposed Finding is vague, incomplete, and contrary to the weight of the evidence. It does not specify by what measure it is the number one producer in China or the number four producer in the world, or bigger than Tronox. { [REDACTED] } (PX5000 at 021 (Figure 3) (Hill Initial Report) (*in camera*)). Tronox also has significantly higher sales of chloride TiO₂ in North America, where Lomon Billions' sales represent less than [REDACTED] of the market. (CCFF ¶¶ 391-92). Finally, the meaning of a significant “jump” in quality is vague, and the weight of the evidence is that the quality of TiO₂ from Lomon Billions does not meet the requirements of customers in North America. (CCFF ¶¶ 748-54).

485. Lomon Billion “is also a vertically integrated producer,” which makes them very competitive with Tronox and other global TiO₂ producers. (Turgeon, Tr. 2663). By combining Lomon, who was “long” in feedstock and had a lot of mines, with Billions, who was “short” in feedstock and had a lot of pigment plants, the post-merger Lomon Billions “bec[a]me a vertically integrated producer with the same position as Tronox.” (Turgeon, Tr. 2663). In fact, this vertical integration at Lomon Billions was “very beneficial for them” and “gave them a boost.” (Turgeon, Tr. 2663). This is the same vertical integration strategy Tronox is pursuing in order to be more competitive. (Turgeon, Tr. 2663).

Response to Proposed Finding No. 485

The Proposed Finding is speculative, in that Mr. Turgeon, as an employee of Tronox, has no apparent foundation for describing the vertical integration that was achieved by the merger of Lomon and Billions. Mr. Turgeon did not refer to any evidence from Lomon Billions referring to vertical integration.

The Proposed Finding is also vague, in that it does not indicate whether it is referring to chloride or sulfate feedstock. It is also incomplete, in that it does not specify a time frame. As the record shows, a substantial amount of feedstock production in China has been closed due to environmental issues, and it is not evident whether Mr. Turgeon took that into account. (CCFF ¶ 771). And as Mr. Turgeon himself described, Chinese producers have faced issues of increasing

feedstock costs, which is what he told investors in his September 2017 RBC presentation. (CCFF ¶ 782; Turgeon, Tr. 2727).

The conclusion in this Proposed Finding that Lomon Billions post-merger had the same position as Tronox is contradicted by the evidence. In the first place, Mr. Turgeon’s testimony only was that Lomon had a lot of mines. (Turgeon, Tr. 2663). However, having mines is not an indicator that Lomon had the capacity to produce either chloride slag or synthetic rutile, the two key feedstocks that Tronox uses for chloride TiO₂ manufacture. (CCFF ¶¶ 6-7). In fact, RX0891, a Lomon Billions presentation, illustrates that very little TiO₂ chloride feedstock is manufactured in China today compared to the rest of the world, whether by Lomon Billions or any other producers. (RX0891 at 0018 (Lomon Billions Presentation)).

486. [REDACTED] Lomon Billions has “stated openly and publicly that their intent is to dominate this industry within the next few years.” (Quinn, Tr. 2347).

Response to Proposed Finding No. 486

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence. The evidence, including testimony from a broad set of industry participants and the documents and statements of Respondents themselves, demonstrates that Lomon Billions, due to issues of capacity, technology, quality, and reliability, is not positioned to be an effective competitive constraint in North America in the foreseeable future. (CCFF ¶¶ 794-807). [REDACTED]

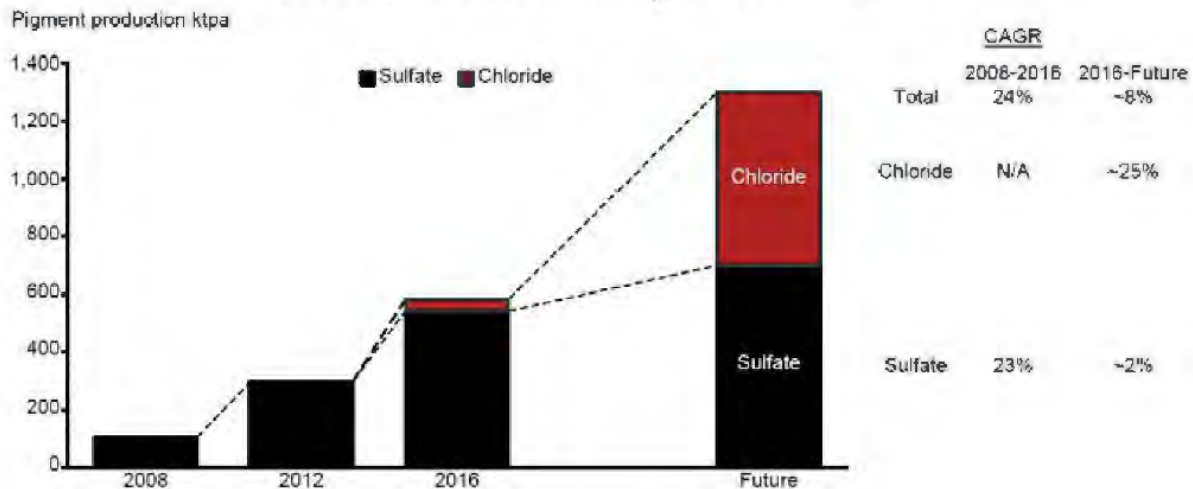
[REDACTED] } (CCFF ¶¶ 762, 787-88). Cristal admitted that [REDACTED]

[REDACTED] } (CCFF ¶763).

487. Today, Lomon Billions has the capacity to produce over 705,000 tons of TiO₂ pigment, compared to Tronox’s current global capacity of 465,000 tons. (Engle, Tr. 2491-92).

Lomon Billions plans to ultimately expand capacity to 1.3 million TPA (*see* Stern Figure 8, RX0171.0040). Lomon Billions “plan[s] to become the global market leader with 1.3 million tons of pigment capacity by mid-2020s.” (RX 1642.0005; Engle, Tr. 2493).

Figure 8¹¹⁵
Lomon Billions’ Projected Growth



Response to Proposed Finding No. 487

The Proposed Finding is incomplete, misleading, and contrary to the weight of the evidence. Respondents’ citation to Mr. Stern’s Figure 8 to describe Lomon Billions’ projected growth should be disregarded by the Court as citing to Mr. Stern for factual propositions that should be established by fact witnesses or documents, not through expert testimony. Figure 8 from his report is lifted directly from a Lomon presentation.

In any event, Figure 8 is vague on its face, referring only to an unspecified “future,” and projections that may or may not come to bear. Figure 8 also is incomplete, as it does not specify whether the growth in sulfate capacity of the combined company is due to the combination of Henan Billions and Sichuan Lomon in 2016 – in other words simply adding together the sulfate TiO₂ capacity of each of the companies. Finally, the reference to Lomon Billions’ future plans refers to events that are at best several years away, and plans that may or may not come to bear. Tronox ordinary course of documents estimate that it takes 4-5 years to build a chloride TiO₂

plant. (CCFF ¶ 806). As described by Mr. Malichky of PPG, the 200,000 ton Lomon Billions chloride TiO₂ expansion, in addition, still is { [REDACTED] } (CCFF ¶ 803; Christian, Tr. 793 (“[I]f you stumbled across a CP plant in the middle of a field and the owner's manual was laying there and the keys were there, it would still take you five to seven years to figure out how to make a quality CP grade on that plant.”)). Finally, the current Lomon Billions chloride TiO₂ plant was originally announced as a plant that would have annual capacity of 100,000 tons of chloride TiO₂, but has never produced at that level, (CCFF ¶ 801), and Lomon Billions has accused its technology provider of causing the “failure” of its chloride TiO₂ plant, (CCFF ¶¶ 742, 760). Further, [REDACTED] [REDACTED] (CCFF ¶ 804). In light of the actual experience of Lomon Billions, the Proposed Finding is highly speculative and misleading.

488. [REDACTED] As Mr. Romano testified, Lomon Billions is “the one that keeps me up at night.” (Romano, Tr. 2243-44).

Response to Proposed Finding No. 488

The Proposed Finding is incomplete and misleading. The opinion of TZMI that Lomon Billions should cause “shudders” is vague, and is contrary to the weight of the evidence that overwhelmingly establishes that Lomon Billions is not likely to be a substantial competitive constraint in North America in the foreseeable future. (CCFF ¶¶ 745-812). Further, although Mr. Romano may have provided self-serving testimony about Lomon Billions, the meaning of the testimony is vague and fails to explain how or why Lomon Billions provides meaningful competition to Tronox or other chloride TiO₂ producers in North America. Moreover, the testimony is contrary to weight of the evidence. (CCFF ¶¶ 745-812). In fact, Mr. Romano is

among the Tronox executives who participates in preparation for earnings calls in which Tronox has repeatedly and recently signaled to investors that it does not face any imminent risk from Chinese competition or expansion. (CCFF ¶¶ 745, 795).

489. The Chinese have also “developed their chloride technology,” which is “strong” today and is “getting stronger.” (Engle, Tr. 2486).

Response to Proposed Finding No. 489

The Proposed Finding is vague, incomplete, misleading, and contrary to the weight of the evidence. Internal Tronox and Cristal documents as well as witnesses at trial described an array of issues that reflect the difficulties that will make it difficult for producers of Chinese chloride TiO₂ producers to expand in North America, including quality issues, development of technology, increasing feedstock costs, increasing environmental regulation, local demand, and logistical issues. (CCFF ¶¶ 745-93). For example, Mr. Quinn and others testified that, after years of efforts, Lomon Billions is still operating its chloride TiO₂ plant at about a 60-70% rate of capacity utilization, which does not imply that Chinese producers are “getting stronger.” (CCFF ¶ 801). In fact, [REDACTED]

[REDACTED] Lomon Billions, for example, has not developed its chloride technology. (CCFF ¶ 805). [REDACTED]

[REDACTED] (CCFF ¶ 804).

490. The Chinese are also “getting larger, and then they’re sophisticated. They’re vertically integrated.” (Engle, Tr. 2486).

Response to Proposed Finding No. 490

The Proposed Finding is vague, incomplete, and misleading. The word “sophisticated” has little probative value in this context – and does not address that Chinese producers of chloride TiO₂ are unlikely to be effective competitive constraints in North America in the foreseeable

future. (CCFF ¶¶ 745-812). Further, the statement that Chinese are vertically integrated also is vague, incomplete, and contrary to the weight of the evidence. The level of vertical integration among Chinese producers is limited (*see* RX0891 at 0018), and further, feedstock costs for Chinese producers are increasing due to the closure of ilmenite mines in China. (CCFF ¶¶ 771-72).

To the extent that Respondents are attempting to make such a suggestion through their vague assertions in this finding that Chinese chloride TiO₂ producers provide effective competitive constraint in North America, the suggestion is contrary to the weight of evidence, for reasons described above and in Complaint Counsel's Proposed Findings. (CCFF ¶¶ 747-807).

491. [REDACTED]

Response to Proposed Finding No. 491

The Proposed Finding is incomplete, misleading, and contrary to the weight of the evidence. The only citation in support of this Proposed Finding is a citation to Mr. Stern's expert report in which he described the content of Lomon Billions' press release.

Further, the evidence demonstrates that [REDACTED], (CCFF ¶¶ 802-03), [REDACTED] (CCFF ¶ 804), and other evidence in the record, (*see generally* CCFF ¶¶ 745-807). Even Respondents' own witness, Mr. Romano, has described the 2019 projection as aggressive. (CCFF ¶ 806). Moreover, Lomon previously announced that its first chloride TiO₂ plant would have the capacity to produce 100,000 tonnes of chloride TiO₂, yet after several years of operation, the company has never produced more than 60,000 tonnes. (CCFF ¶ 801).

492. Lomon Billions intends to expand its total TiO₂ capacity to 1.3 million tons from its current level of 600,000 tons. (Turgeon, Tr. 2666-67). This is part of Lomon Billions' strategy to be the "number one producer of pigment in the world." (Turgeon, Tr. 2666-67).

Response to Proposed Finding No. 492

The Proposed Finding is incomplete and misleading. Lomon Billions may have made an announcement about an intent at some point in the future to expand capacity, but whether and when Lomon Billions will successfully implement any expansion is highly uncertain and speculative, due to factors such as their ability to implement the technology successfully. (CCFF ¶¶ 801-07, 755-65 (*citing, e.g.,* PX3027 at 024 (July 2017 Venator Analyst Day presentation) ([REDACTED] ([REDACTED] } (*in camera*); PX1012 at 005 (Tronox TiO₂ 2017 Strategic Plan) ([REDACTED] ([REDACTED] } (*in camera*); Christian, Tr. 809-10 ([REDACTED] ([REDACTED] } (*in camera*)). Further, the Proposed Finding does not account for the impact of expected capacity closures in China. (CCFF ¶¶ 779-83).

a. The Chinese Are Rapidly Expanding Their Presence Across the Globe, Including in North America.

493. China dominates the TiO₂ export market. (Stern, Tr. 3820).

Response to Proposed Finding No. 493

The Proposed Finding is vague, incomplete, and therefore misleading. The term "dominates" and the term "TiO₂ export market" are both too vague to be probative of the competitive constraint provided by Chinese TiO₂ producers in any particular market, let alone North America specifically. The Proposed Finding does not distinguish in addition, between

chloride and sulfate TiO₂ (or distinguish the anatase grades of sulfate TiO₂ that Respondents admit are outside the market).

Figure 41, which Mr. Stern refers to in the cited testimony, is difficult to interpret. For example, although Mr. Stern was asked what Figure 41 shows about exports and claimed that you can clearly see that claims that Figure 41 “clearly shows that China dominates that picture,” (Stern, Tr. 3820), the Figure does not even contain the word export. If Figure 41 stands for the proposition that exports of TiO₂ from China were almost 1.5 million tons in 2017, then this information is contradicted by RX1198, which shows exports of TiO₂ from China of about 830 thousand tons in 2017. (RX1198 at 0067). Further, the Proposed Finding is contrary to the weight of the evidence, including documents as well as the testimony of Tronox witnesses, that increased demand in China, coupled with reduced capacity and production, is likely going to limit Chinese exports of TiO₂ for the foreseeable future. (CCFF ¶¶ 776-77).

494. In 2008, exports of TiO₂ from China into the rest of the world were about a hundred thousand tons per year. (Romano, Tr. 2221-22).

Response to Proposed Finding No. 494

The Proposed Finding is vague, incomplete and misleading because it does not specify whether it referring to chloride or sulfate TiO₂ exports (or whether the sulfate TiO₂ exports included anatase grades), and does not describe to which countries the exports were directed.

495. China became a net exporter of TiO₂ in May 2013. (Turgeon, Tr. 2665). The amount it has exported has increased dramatically since. (Turgeon, Tr. 2665-66). From May 2013, five years ago, to today, “China has grown its export of pigment year after year, and today it’s a million ton that is coming out of China.” (Turgeon, Tr. 2666). When domestic demand slowed in China in late 2014, Chinese producers maintained their production levels and exported more TiO₂. (Arndt, Tr. 1421-22).

Response to Proposed Finding No. 495

The Proposed Finding is vague and incomplete. It does not specify whether it is referring to exports of sulfate or chloride TiO₂ (and whether the sulfate TiO₂ exports include anatase grades), and also fails to explain that the large majority of increased exports from China have been and continue to be exports to the Asia-Pacific region. (PX9077 at 062 (TZMI Supply Demand)). Further, overall exports of TiO₂ from China to North America declined during 2017, (CCFF ¶ 786), due to substantially reduced production of TiO₂ and continuing increases in demand in China, (CCFF ¶¶ 777-78).

Respondents' reference to Mr. Arndt's testimony is also incomplete and misleading. Putting aside the continuing issue of Respondents' failure to distinguish between chloride and sulfate TiO₂ (including anatase grades), Dr. Hill's report showed that there was virtually no increase in exports of TiO₂ from China to North America during 2014. (PX5000 at 035-36 (Fig. 13 and 14) (Hill Initial Report) (*in camera*); PX9077 at 068 (TZMI Presentation)).

496. Competition has continued to grow each year since China became a net-exporter of TiO₂. (Turgeon, Tr. 2666-67). Indeed, while "Lomon Billions is the biggest," there are "tens" of Chinese companies that are "exporting pigment and competing with [Tronox] on a global scale." (Turgeon, Tr. 2666). As of the end of 2017, exports of TiO₂ from China into the rest of the world were about "a million tons per year." (Romano, Tr. 2221-22).

Response to Proposed Finding No. 496

The Proposed Finding is vague, incomplete and contrary to the weight of the evidence. Mr. Turgeon's testimony that competition has "grown" and that Tronox is competing with Chinese TiO₂ producers on a "global scale" is vague.

For example, to the extent that his vague references could be read to relate to competition from Chinese producers of TiO₂ in North America, Mr. Turgeon's testimony is contradicted by his 2017 presentation at RBC that describes a "Favorable Industry Outlook", due to the increased environmental controls and higher costs in China. (CCFF ¶ 782). This Proposed Finding is also

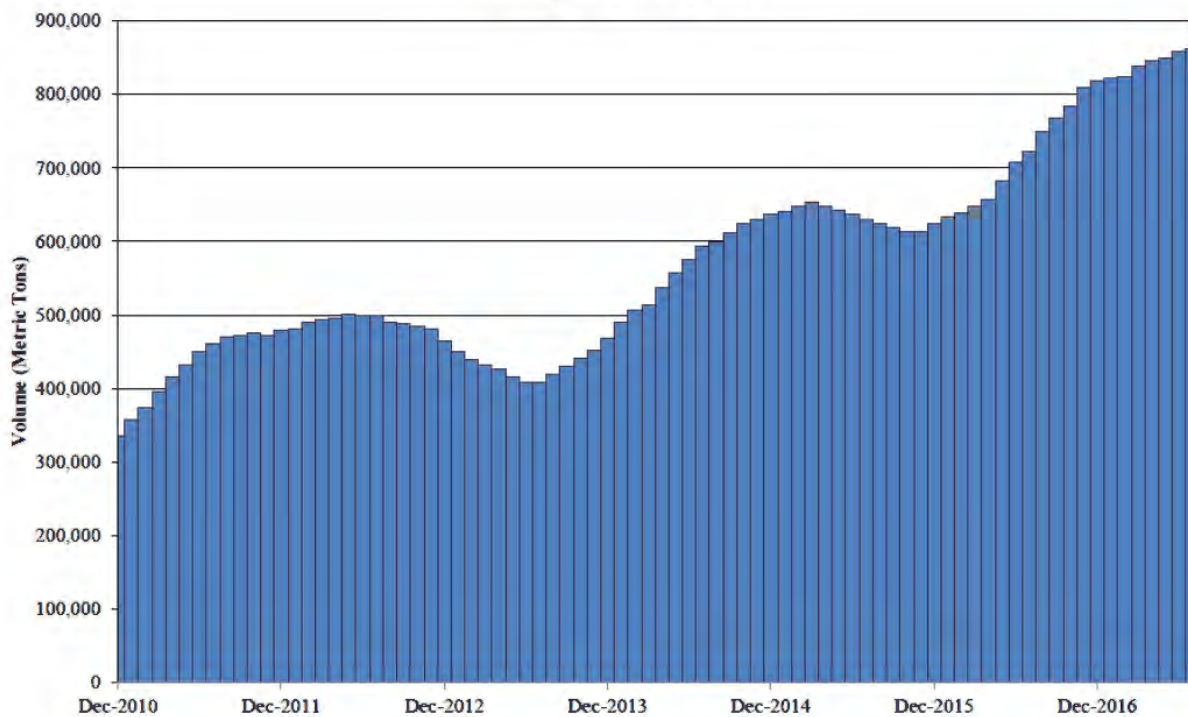
contradicted also by the weight of the other evidence in the record that TiO₂ manufactured in China is not an effective substitute today, and is not likely to be in the foreseeable future. (*See generally* CCF ¶¶ 26-133 (sulfate TiO₂), ¶¶ 384-86 (current sales of Chinese chloride TiO₂), ¶¶ 745-812 (potential entry by Chinese manufacturers of chloride TiO₂).

Further, Respondents' citation to the testimony of Mr. Romano is incomplete and misleading because it fails to disclose that the vast majority of the exports from China have for many years been directed to other countries in Asia, as well as Central and South America and the Middle East and Africa. (*See, e.g.*, RX1198 at 0072 (TZMI Supply Demand, November 2017)).

497. Shehadeh Figure 48 (RX0170.0096) shows the rolling 12-month average of Chinese TiO₂ exports from January 2010 - July 2017. (Shehadeh, Tr. 3223-24).

Figure 48

**Chinese TiO₂ Exports
January 2010 - July 2017**



Response to Proposed Finding No. 497

The Proposed Finding is incomplete and misleading. It fails to disclose whether the exports are sulfate or chloride TiO₂ (or whether the sulfate includes anatase grades), and further to which countries the exports are directed. As Complaint Counsel has described in response to Proposed Findings 495 and 496, further, the large majority of those TiO₂ exports from China, are directed to areas other than North America, and the weight of the evidence in the record indicates that exports from China to North America are unlikely to grow in the foreseeable future. (*See generally* CCFE ¶¶ 745-812).

498. As shown by Shehadeh Figure 48 (RX0170.0096), even though Chinese exports to North America increased approximately five-fold from 2010 to 2016, the 50,000 tons of exports from China to North America in 2016 is still “a relatively small portion of total exports from China.” (Shehadeh, Tr. 3224). The significant volume of exports “on the water” from China reflect “alternative sources of supply” for customers around the world, including in North America. (Shehadeh, Tr. 3224-26).

Response to Proposed Finding No. 498

The Proposed Finding is vague, incomplete, misleading, and contrary to the weight of the evidence. Shehadeh Figure 48 includes not only all rutile grades, chloride and sulfate, but also anatase grades, which are all sulfate. On its face, therefore, Figure 48 includes products that even Respondents agree are outside the relevant market.

Further, the Proposed Finding does not address the decline in exports of TiO₂ from China to North America during 2017, a decline driven by a variety of factors including reduced production, increased feedstock costs, and continuing increases in demand. (CCFE ¶¶ 775-86).

Moreover, Dr. Shehadeh’s theoretical conclusion that current Chinese exports are “alternative sources of supply” is contradicted by the real world evidence that he failed to consider, including customer testimony, the testimony of Kronos, and the public disclosures of Tronox, which all demonstrate that Chinese manufactured sulfate grades of TiO₂ are not effective substitutes for chloride TiO₂ in North America, (CCFE ¶¶ 26-133), that Chinese manufactured

chloride grades of TiO₂ are not current effective competitors in North America, (CCFF ¶¶ 384-86), and that Chinese manufacturers of chloride TiO₂ grades are not potential entrants in the foreseeable future. (CCFF ¶¶ 745-812).

499. In 2017 and 2018, Chinese exports had two main impacts on the TiO₂ market: First, they “[took] business from other sulfate producers, they [took] business from chloride producers.” (Arndt, Tr. 1410). Second, they caused “dislocation” in the market from the business they take. (Arndt, Tr. 1410).

Response to Proposed Finding No. 499

The Proposed Finding is vague, incomplete, misleading and contrary to the weight of the evidence. First, the reference to an overall “TiO₂ market” is contrary to the substantial evidence that the relevant market is the North American market for chloride TiO₂. (CCFF ¶¶ 26-323). In addition, although claim in the Proposed Finding that Chinese exports took business from chloride producers contains no geographic dimension, the weight of the evidence is that these exports did not take sales from chloride TiO₂ producers in North America. (CCFF ¶¶ 382-86). To the extent that Mr. Arndt meant to refer to competition from Chinese exports to North America, the finding would run contrary to the weight of the evidence, including the public disclosures which Mr. Arndt is heavily involved in preparing. (PX7011 (Arndt, Dep. at 58-59) (*in camera*); CCFF ¶ 745 (*citing* (PX9001 at 009 (Tronox Q3 2016 Earnings Call) (“So the question for us is, do we confront China-produced supply in the market as a competitive alternative to our supply? And as I’ve said, we don’t. . . . [T]he kind of customers that will buy our high-quality pigments are not simultaneously looking at for the same supply need Chinese product.”); PX9006 at 006 (Tronox Q2 2015 Earnings Call) (“We do not see that exports from China or from Europe are playing a material role in the competitive balance in the North American market.”); PX9010 at 010 (Tronox Q2 2014 Earnings Call) (Chinese TiO₂ producers have thus far failed to establish themselves as a “material competitive presence, either in terms of volume or in terms of price. That implies to [Tronox] that

it's staying pretty much within the Chinese or the Asian market. I think a lot of supply generally from China generally tends to go into Latin America, then into the Middle East. It's simply not a major force in our markets.”). Finally, the reference to a “dislocation impact” is speculative. Mr. Arndt, who does not have an operational role in Tronox’s TiO₂ business, provided no examples in support of his generalized testimony relating to this theoretical impact of Chinese TiO₂ exports to regions other than North America.

500. These Chinese producers are “very strong competitor[s].” (Turgeon, Tr. 2666).

Response to Proposed Finding No. 500

The Proposed Finding, citing the opinion of Mr. Turgeon, is vague and incomplete and misleading, because it does not specify whether Mr. Turgeon was referring to sulfate or chloride producers, and it does not address specific regions.

Moreover, to the extent that this Proposed Finding could be read to suggest that Mr. Turgeon was referring to increasing competition from Chinese producers in North America, that inference would run contrary to Mr. Turgeon’s own public disclosures in September 2017 at the RBC conference referencing “Inflationary Pressures” on Chinese TiO₂ producers such as increasing feedstock costs, higher energy and labor costs, and increasing environmental regulation, as well as limited new capacity and industry rationalizations. (RX0981 at NATIVE slide 16) All of these are among the factors that contributed to the described favorable industry outlook for Tronox’s TiO₂ business. (RX0981 at NATIVE slide 13). If read to suggest increasing competition in North America, the Proposed Finding also would contradict the weight of the evidence, including the trial and deposition testimony of customers and competitors, Tronox ordinary course documents, and public disclosures of Tronox and other TiO₂ producers, that sulfate TiO₂ manufactured in China is not an effective substitute for chloride TiO₂ in North America,(CCFF

¶¶ 26-133), that chloride TiO₂ manufactured in China is not an effective substitute (CCFF ¶¶ 384-86), and that chloride TiO₂ manufacturers are not potential entrants in the foreseeable future. (CCFF ¶¶ 745-812).

501. Lomon Billions has “established a significant footprint with a sales and marketing group and staff in Europe, they’ve done the same in North America, so they are definitely not a Chinese company that’s only supplying the Chinese market. They are a global company.” (Romano, Tr. 2245). In some areas of the world, Chinese product has displaced product sold by Tronox “completely.” (Romano, Tr. 2246).

Response to Proposed Finding No. 501

The Proposed Finding is contrary to the weight of the evidence. Mr. Romano’s opinion relating to Lomon Billions’ “significant footprint” in Europe and in North America can be compared to the factual testimony provided by Ms. Noe of Lomon Billions. She testified that Lomon Billions has two employees in North America, (CCFF ¶ 798), and has no capabilities in North America to provide technical service, (CCFF ¶ 800). She also testified that Lomon Billions sells only one grade of chloride TiO₂ in North America, (CCFF ¶ 798), and struggles to provide on-time delivery in North America, due to problems with delays at ports, (CCFF ¶ 791). Further, the fact that in other areas of the world Tronox may have lost business to unspecified “Chinese product” is not probative. Tronox does not specify whether Mr. Romano was referring to chloride or sulfate grades, and the distinction is critical, for in other parts of the world, sulfate grades are closer substitutes to chloride grades than they are in North America. (CCFF ¶¶ 41-45, 61, 107; *see also* Christian, Tr. 781-82 (describing stronger preference in North America for chloride grades compared to sulfate grades of TiO₂)). Mr. Romano’s vague testimony is also contradicted by the substantial record evidence that Chinese manufactured TiO₂ accounts for de minimis sales of chloride TiO₂ in North America, that Chinese manufactured sulfate grades do not provide a competitive constraint, and that theoretical expansion of Chinese manufactured TiO₂ is

unlikely to provide a competitive constrain in the foreseeable future. (CCFF ¶¶ 26-323, 382-86, 745-812).

502. Chinese competition is growing quickly in North America. [REDACTED] From 2010 to 2016, Chinese imports of TiO₂ into North American increased by “approximately five times.” (Shehadeh, Tr. 3220-21). [REDACTED] Customers in North America initially began to use Chinese product to lower their costs. As Chinese quality has increased, customers have increased the amount of Chinese TiO₂ they are purchasing. (Turgeon, Tr. 2670). Chinese imports into North America are “growing” and have “been growing since 2013.” (Turgeon, Tr. 2671).

Response to Proposed Finding No. 502

The Proposed Finding is incomplete and contrary to the weight of the evidence. Major chloride TiO₂ customers are not increasing the amount of TiO₂ that they source from China. Instead, they continue to use small amounts of sulfate and chloride Chinese TiO₂ in lower performance applications, such as primers. (CCFF ¶¶ 31-133, 385-86, 748-54). Although Respondents cite to Dr. Shehadeh for the proposition that imports of Chinese TiO₂ increased by five times from 2010 to 2016, and setting aside that again, his estimates includes chloride and sulfate (including anatase) TiO₂, that statement is highly misleading, beginning with the fact that imports over the entire period were relatively small, but there was one year, 2016, where exports of TiO₂ from China were at a somewhat higher level compared to the previous five years, albeit still a relatively low level. (RX1198 at 0072 (TZMI Presentation)). Further, Dr. Shehadeh failed to disclose two pieces of information that were available to him. First, as Dr. Hill described, those imports from China largely displaced other imported sulfate TiO₂. (PX5000 at 036 (Fig. 14) (Hill Initial Report) (*in camera*)). Second, imports of Chinese manufactured TiO₂ declined substantially from 2016, when he cut off his observation, into 2017. (CCFF ¶ 786). This also contradicts Mr. Turgeon’s testimony. Finally, the Proposed Finding that TiO₂ consumers in North

America are increasing the amount of TiO₂ that they are purchasing from Chinese manufacturers is contrary to the weight of the evidence. (CCFF ¶¶ 26-323, 382-86, 748-54).

503. “[W]e are seeing... exports from China to the United States of both chloride and sulfate TiO₂.” (Stern, Tr. 3825). Additionally, Lomon Billions is significantly expanding its chloride capability in China, and targeting the North America for increased exports. (Engle, Tr. 2498-99 (discussing RX1642); Stern, Tr. 3825).

Response to Proposed Finding No. 503

The Proposed Finding cites to Mr. Stern twice for factual observation about exports of TiO₂ from China to the U.S., and about Lomon Billions purportedly “targeting” North America for increased exports. Respondents’ citation to Mr. Stern for these observations should be disregarded by the Court as citing to Mr. Stern for factual propositions that should be established by fact witnesses or documents, not through expert testimony.

In any event, Complaint Counsel do not dispute Mr. Stern’s observation that there are exports of chloride and TiO₂ from China to the U.S. Complaint Counsel has provided market shares that account for imports of chloride TiO₂ to North America, consistent with the methodology of the Horizontal Merger Guidelines. (CCFF ¶¶ 394-97). However, his cited testimony that Lomon Billions is “targeting” North America for increased exports is vague, speculative, conclusory, and lacks foundation. Mr. Stern had speculated in his report that because North America consumers prefer chloride TiO₂, “Chinese producers can be expected to target chloride sales in North America.” (RX0171 at 0120 (¶ 253) (Stern expert report) (*in camera*)). However, his testimony and report is contradicted by the detailed evidence regarding the likely limited impact of Lomon Billions and other Chinese chloride TiO₂ manufacturers on the sales of chloride TiO₂ in the foreseeable future. (CCFF ¶¶ 745-812).

Finally, as discussed above with respect to Proposed Finding 467, the Proposed Finding misrepresents Mr. Engle’s testimony relating to RX1642. (See CCRRFF ¶ 467, above).

504. Turgeon agreed that Chinese TiO₂ producers are “disruptors” in the global market. (Turgeon, Tr. 2733-34).

Response to Proposed Finding No. 504

The word “disruptor” in the Proposed Finding is vague, misleading and contrary to the weight of the evidence. There are TiO₂ producers in China, and the weight of evidence suggests that Chinese TiO₂ producers are not material competitive constraints, let alone “disruptors,” in the North American market for chloride TiO₂. (CCFF ¶¶ 382-86, 745-812; *see also* CCFF ¶ 204 (*citing* PX9006 at 006 (Tronox Q2 2015 Earnings Call) (Tronox then-CEO noting that it did “not see that exports from China or from Europe are playing a material role in the competitive balance, particularly in the North American market.”)). Further, the phrase “global market” is both vague and contrary to the weight of the evidence that the relevant market is the sale of chloride TiO₂ in North America. (CCFF ¶¶ 26-329).

505. Lomon Billions’ ability to produce at a low cost is a competitive advantage because it can “compete more aggressively” during both the up-cycles and down-cycles in price that characterize the TiO₂ industry. (Engle, Tr. 2496).

Response to Proposed Finding No. 505

The Proposed Finding is vague, misleading, and contrary to the weight of the evidence. Mr. Engle in his testimony was referring to a document produced by a third party, Lomon Billions, and the chart in the document, which Mr. Engle did not disclose in his testimony, does not distinguish between chloride and sulfate TiO₂. The weight of the evidence is that sulfate TiO₂ manufactured in China is not a competitive alternative to chloride TiO₂ in North America. (CCFF ¶¶ 26-329, 382-86). With reference to chloride TiO₂, furthermore, it would not be accurate to characterize Lomon Billions as a low cost producer. (CCFF ¶ 770 (*citing* PX3011 at 019 (Kronos presentation) (“Benefits of production in China such as low labor and environmental costs not applicable to chloride technology.”)); CCFF ¶ 769 (*citing* PX1663 at 133-53 (TZMI presentation)

{ [REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED] } (*in camera*); Christian, Tr. 796 (“[C]heap labor and relaxed environmental standards” are not applicable to chloride TiO₂ as opposed to sulfate TiO₂ because “because [the latter is] much more labor-intensive and it generates a significant amount of waste or byproducts per ton of TiO₂.... So when you think about China as a potential competitor, a lot of their historic, perceived advantages over the western world just don’t exist or at least aren’t overly material in comparison to western producers.”); *see generally* CCF 766-74 (detailing the evidence that Chinese chloride TiO₂ manufacturers lack a cost advantage over North American producers)).

506. Chinese companies are not publicly listed and have the freedom to invest capital in ways that are not responsive to shareholders as is typically required of Western producers. (Turgeon, Tr. 2666-67).

Response to Proposed Finding No. 506

The Proposed Finding is factually inaccurate. Lomon Billions, for example, is publicly traded. (RX1642 at 0005 (Lomon Billions Presentation)).

507. The shift toward Chinese product in Europe has followed a similar path to North America. (Turgeon, Tr. 2670). [REDACTED]

Response to Proposed Finding No. 507

The Proposed Finding is vague, misleading, and incomplete. As RX1198 indicates, there has for many years been more sulfate TiO₂ exported from China to Europe than there has from China to North America. (RX1198 at 0072 (TZMI Presentation)). In light of that, it is difficult to

ascertain what Mr. Turgeon could be referring to in terms of describing a “similar path to North America.” Further, it may be accurate that Dr. Hill “admitted” that TZMI had reported certain information about exports from China to Europe, but what Respondents do not discuss is that Dr. Hill described { [REDACTED]

[REDACTED] } (CCFF ¶ 633 (*citing* Hill, Tr. 1822 ({ [REDACTED]

[REDACTED] } (*in camera*)).

508. TiO₂ producers in North America are losing market share to Chinese producers in their export markets. (Stern, Tr. 3828). [REDACTED]

Response to Proposed Finding No. 508

The Proposed Finding is incomplete and misleading. Due to different quality requirements and preferences, TiO₂ consumers in South American can more easily substitute to sulfate grades of TiO₂ than consumers in North America. (*See, e.g.*, Young, Tr. 679-80 ({ [REDACTED] [REDACTED] }) (*in camera*)). However, the weight of the evidence demonstrates that the situation is quite different in North America. (CCFF ¶¶ 31-133, 385-386, 748-754). Further, the statement that Chinese competition in North America is “growing quickly” is vague, and is contrary to the weight of

evidence. Competition from Chinese TiO₂ in North America is limited, and has been for years. (CCFF ¶¶ 31-133 (discussing sulfate TiO₂), ¶¶ 385-86 (discussing limited sales of Chinese chloride TiO₂ in North America), ¶¶ 748-54 (discussing quality issues customers in North America have had with Chinese chloride TiO₂)). Indeed, if it were not the case that the competition from China has been limited, it is not likely that Tronox would have been continuing to represent to investors that TiO₂ manufactured in China does not have a “material competitive presence” as a competitor to Tronox. (CCFF ¶ 745 (*citing* PX9010 at 010 (Tronox Q2 2014 Earnings Call) (Chinese TiO₂ producers have thus far failed to establish themselves as a “material competitive presence, either in terms of volume or in terms of price. That implies to [Tronox] that it’s staying pretty much within the Chinese or the Asian market. I think a lot of supply generally from China generally tends to go into Latin America, then into the Middle East. It’s simply not a major force in our markets.”))).

509. [REDACTED]

Response to Proposed Finding No. 509

The Proposed Finding is vague, incomplete, and therefore misleading. To the extent that sales of Chinese TiO₂ in South America has displaced sales by North American producers, the proposed finding does not address the regions where North American producers are purportedly competing more aggressively. Therefore, Mr. Engle’s vague testimony does not indicate the degree to which this purported “competitive pressure” affected chloride TiO₂ pricing in North America.

The real world experience of TiO₂ producers suggests that the theory of displaced sales described in this Proposed Finding has had limited to no effect. Dr. Hill found that prices in North

The Proposed Finding is vague and incomplete, for it contains no geographic delineation as to where the grades “compete” against Tronox grades. Further, to the extent it is intended to refer to North America, then it is also contrary to the weight of the evidence showing that Chinese manufactured TiO₂ is not competitive with Tronox’s chloride TiO₂ in North America. (CCFF ¶¶ 26-133 (sulfate grades of TiO₂), 382-386 (limited North American sales of Chinese produced chloride TiO₂), 748-754 (North American customer issues with quality of Chinese manufactured chloride TiO₂). Indeed, if the fact of the grade chart were an indication that Tronox about five years ago began to view Chinese producers as competitive constraints, then Tronox’s public disclosures over the last several years – specifying that the Chinese are not a competitive constraint on Tronox - would have been inaccurate. (CCFF ¶¶ 745, 462 (steps Tronox takes to make sure public disclosures are accurate)).

b. Chinese Product Quality Is Continually Increasing.

511. The quality of Chinese TiO₂ has improved in “recent year[s]” and “continue[s] to improve,” in part because Chinese TiO₂ producers are “very aggressive.” (Turgeon, Tr. 2661).

Response to Proposed Finding No. 511

The Proposed Finding is vague, incomplete, and contrary to the weight of the evidence. Based on opinions expressed by Mr. Turgeon, it makes a highly general and self-serving statement that Chinese TiO₂ has improved and that Chinese producers are aggressive. However, the weight of the evidence demonstrates that the neither Chinese manufactured sulfate or chloride TiO₂ is a competitive constraint in the North American market for chloride TiO₂, nor is likely to be in the foreseeable future. (CCFF ¶¶ 26-133, 382-86, 748-812). For example, although Mr. Turgeon observed (in the trial testimony cited in the above Proposed Finding) that the “quality” of Chinese manufactured TiO₂ is “as good as us today,” that testimony was contradicted by all of the

customers that testified at trial, by Kronos, and by repeated and recent public disclosures of Tronox. (CCFF ¶¶ 26-133, 382-86, 745, 748-54).

512. Chinese TiO₂ quality has rapidly improved since 2012, and this improvement continues. (Engle, Tr. 2486; Stern, Tr. 3745). Since 2012, Chinese companies have improved their sulfate grades such that they compete in certain specifications anywhere in the world. (Arndt, Tr. 1408). Indeed, some tier-one type producers from China produce TiO₂ product that is indistinguishable from Western material. (Engle, Tr. 2486-89; Stern, Tr. 3840).

Response to Proposed Finding No. 512

The Proposed Finding is vague, incomplete, and contrary to the weight of the evidence. To the extent that this Proposed Finding cites to Mr. Stern's testimony regarding the quality of Chinese TiO₂, he has no experience in the TiO₂ industry, (Stern, Tr. 3855-59 (describing how Mr. Stern has no experience related to use, marketing, distribution of manufacturing of TiO₂)), and Respondents provided no basis on which to establish that he has any foundation for evaluating the quality of TiO₂ produced in China, and his testimony should not be credited. (*See* Stern, Tr. 3745 (no questions to establish Mr. Stern's basis for opining that the quality of Chinese TiO₂ has improved)).

The cite to Mr. Engle related to improved quality is vague and incomplete, and is contrary to the overwhelming record evidence. (CCFF ¶¶ 26-133 (sulfate grades not competitive in North America); ¶¶ 748-54 (North American customer issues with quality of Chinese manufactured chloride TiO₂)). Further, the Proposed Finding, which cites to Mr. Engle to support the proposition that Chinese manufacturers "produce TiO₂ product that is indistinguishable from Western material," is incorrect. Mr. Engle described some unspecified amount of Chinese manufactured TiO₂ to be "comparable" to Tronox TiO₂, which is a much weaker statement than "indistinguishable," the word Tronox chose for this finding. The weight of the evidence, in any event, is that in North America, the Chinese manufactured TiO₂ is far from indistinguishable to

the chloride TiO₂ that customers such as PPG, Sherwin Williams, Masco, Deceuninck, and many others require. (CCFF ¶¶ 26-133, 382-86, 745, 748-54).

Further, the cite to Mr. Arndt is also vague and incomplete, with reference to “certain specifications anywhere in the world.” On its face, it is uncertain what those specifications are. But since the earnings calls for which Mr. Arndt oversees preparations for have always indicated that Chinese TiO₂ has not been a material competitive presence for Tronox, it is a fair inference that he was not referring to the real world applications for which Tronox sells TiO₂ in North America. (CCFF ¶ 745).

513. Tronox noted a significant increase in Lomon Billions’ quality after the combination of the individual Lomon and Billions companies. (Turgeon, Tr. 2663-64). [REDACTED]

Response to Proposed Finding No. 513

The Proposed Finding is vague and contrary to the weight of the evidence. The opinions of Mr. Stoll, and Mr. Turgeon regarding the quality of Chinese manufactured TiO₂, is contradicted by the testimony of third parties such as PPG, Sherwin Williams, Masco and others, by the testimony of Kronos, and by the public disclosures of Tronox. (CCFF ¶¶ 26-133, 382-86, 745, 748-54). Further, the testimony of Mr. Stoll, whose role with Cristal and Tasnee over the last several years has related primarily to M&A, (PX7006 (Stoll, Dep. at 9-10) (*in camera*)), was contradicted by the deposition testimony of Cristal’s Brian Pickett, who has a North American sales role for Cristal, and is much closer to the competitive environment for TiO₂ in North America

than Mr. Stoll. Mr. Pickett testified that { [REDACTED] } (PX7037 (Pickett, Dep. at 57-59) (*in camera*)).

514. Today, Chinese sulfate products compete with Tronox’s chloride products. (Romano, Tr. 2242). The Chinese “make very good grades, and in some instances those grades are better than [Tronox’s].” (Romano, Tr. 2239). In particular, sulfate TiO₂ from Lomon Billions “has continued to get better,” such that “they have some grades that actually perform better than [Tronox’s] in some architectural applications.” (Romano Tr. 2244).

Response to Proposed Finding No. 514

The Proposed Finding is contrary to the weight of the evidence. There was extensive testimony that the customers in North America, in making decisions about what grades of TiO₂ to use, do not consider Chinese manufactured sulfate TiO₂ to be better than Tronox’s, are not using it in applications other than primers and lower performance applications, and would not use it in response to changes in relative price. (CCFF ¶ 26-133). Further, it was well established at trial that the sulfate TiO₂ from Lomon Billions that Mr. Romano referred to does not, according to North American customers, perform better than Tronox TiO₂ in architectural applications. (*See generally* CCFF ¶¶ 26-133, 120 (*citing* PX1399 at 004-05 (Sept. 2013 “Fireside chat” Q&A with Tronox CEO) ({ [REDACTED]

[REDACTED]
[REDACTED]
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[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (*in camera*)). It is possible

that Mr. Romano was referring to regions of the world other than North America, but if not, his testimony is inaccurate and contrary to Tronox public disclosures. (CCFF ¶ 26-133, 745).

515. [REDACTED]

[REDACTED]
(Pschaidt, Tr. 1005-06; PX4142). As [REDACTED]
[REDACTED] (Pschaidt, Tr. 1007).

Response to Proposed Finding No. 515

The Proposed Finding is incomplete and misleading. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED] (CCFF ¶¶ 53-54, 64, 130). Indeed, what Respondents do not mention is that { [REDACTED]

[REDACTED] } (CCFF ¶ 54; see Pschaidt, Tr. 1043 (*in camera*)). { [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (Pschaidt, Tr. 1008 (*in camera*)).

516. Since 2012, China has made “great strides” in the commercialization of chloride-process TiO₂ technology. (Arndt, Tr. at 1407). [REDACTED]

[REDACTED] Lomon Billions' current chloride plant is running at a capacity of 70,000 tons per year. (Romano, Tr. 2244). Lomon Billions will expand production at its chloride plant by 300,000 tons per year at the end of 2019. (Romano, Tr. 2244-45). Lomon Billions has plans to bring online a total of 500,000 additional tons of chloride TiO₂ capacity, including building a facility of 300,000 tons of chloride-process TiO₂ along with expanding its existing facility in Sichuan province by another 200,000 tons. (Romano, Tr. 2244).

Response to Proposed Finding No. 516

The Proposed Finding is vague, misleading, and contradicted by the weight of the evidence. To the extent that Mr. Arndt testified to the purported great strides made by Chinese chloride process TiO₂ producers, it becomes particularly striking that his opinion runs counter to disclosures made by Tronox to its investors regarding the competitive impact of Chinese producers of TiO₂. (CCFF ¶ 745). Further, his opinion is contrary to the overwhelming weight of the evidence, which tends to show that the Chinese chloride TiO₂ producers have not made great strides, and are not competitive constraints in North America. (CCFF ¶¶ 745-812).

The Proposed Finding is also misleading to the extent that it may suggest that Mr. Christian and Mr. Malichky were describing two separate plants of Lomon Billions. They each were referring to the single chloride process TiO₂ plant that Lomon Billions operates, and that has a capacity of 100,000 tons.

Further, the reference to what Lomon "will" do by 2019 also is misleading. Mr. Romano is not in a position to know what Lomon Billions will do, and his testimony is based largely on their press release. (PX7046 (Romano, Dep. at 203-04) ([REDACTED]

[REDACTED] } (in camera)). Further, although it has announced this "aggressive" timeline, (PX9101

at 008 (Tronox Q4 2017 Earnings Call), which would have them add capacity faster than an experienced Western producer such as Chemours (CCFF ¶ 806), Lomon Billions has { [REDACTED] } (CCFF ¶ 804). In addition, Mr. Malichky of PPG has visited the Lomon Billions chloride TiO₂ plant, knows that { [REDACTED] } (CCFF ¶ 802), and based on first hand information, is { [REDACTED] } (CCFF ¶ 803).

Moreover, if the press release were an assurance, then Lomon Billions would today produce 100,000 tons of chloride process TiO₂ because that is what their press release said they would do when they built their first plant. (RX1101 (PPG press release)). Instead, Billions is operating that plant only at the low capacity utilization of about 60-70%. (CCFF ¶ 801). Even if Lomon Billions expands capacity, it is speculative what impact that would have in North America in the foreseeable future, for Respondents admit that a substantial portion of the increased capacity and production would serve local demand. (CCFF ¶ 795).

Finally, the Proposed Finding also cites to Mr. Romano's speculation that at some unspecified point in the future, Lomon Billions will add an additional 300,000 tonnes of chloride TiO₂ capacity. But this future unspecified expansion is on its face highly speculative and uncertain. Respondents provided no evidence from Lomon Billions that would support Mr. Romano's assertion.

517. In recent years, Chinese producers have also become "very competitive and aggressive" in terms of technical developments for upgrading ilmenite. (Turgeon, Tr. 2610). China is "where the most development has been done recently to upgrade ilmenite." (Turgeon, Tr. 2610). Chinese producers have "developed smelting technology." (Turgeon, Tr. 2610). Chinese producers have developed "new ways to upgrade" and "produce [synthetic rutile] in ways that [Turgeon]" has not seen before. (Turgeon, Tr. 2610-11).

Response to Proposed Finding No. 517

The Proposed Finding is vague, misleading and contrary to the weight of the evidence. Mr. Turgeon in the cited testimony made general references to Chinese technology for upgrading ilmenite, without identifying for example specific facilities or companies, and it would be misleading to interpret his testimony as relating in a substantial way to the manufacture of chloride TiO₂ in China. If Respondents are attempting to make such an implication, moreover, it would be contrary to the record. There is only limited availability of ilmenite in China, and limited capacity to manufacture chloride feedstocks. (RX0891 at 0018 (Lomon Billions Presentation)) Therefore the record indicates that because the high-grade feedstock required to run a chloride TiO₂ plant must be imported into China, the cost of feedstock is increasing in China, and that the availability and cost of feedstock is a “headwind” for Chinese TiO₂ producers. (CCFF ¶ 765, 771-74; Christian, Tr. 793-95).

c. Customers Are Increasingly Switching Over to Chinese Suppliers.

518. Customers in North America initially began to use Chinese product “to lower their costs and keep [Tronox] more competitive.” (Turgeon, Tr. 2670). As Chinese quality has increased, customers are now able to “put even more Chinese pigment in the mix of their product.” (Turgeon, Tr. 2670).

Response to Proposed Finding No. 518

The Proposed Finding is contrary to the weight of the evidence. North American customers are not using increased amounts of Chinese produced TiO₂ – chloride or sulfate - in their products, contrary to what Mr. Turgeon may have stated. (CCFF ¶¶ 26-133, 748-54). Further, Mr. Turgeon’s observation is not consistent with the repeated and recent public disclosures of Tronox. (CCFF ¶¶ 745, 786, 120; *see, e.g.*, PX1395 at 008 (Draft earnings call Q&A’s email from Arndt to Turgeon, et al) (“Chinese exports have indeed increased but the exports have largely stayed within Asia-Pacific to serve low-grade sulfate pigment applications – applications that do not compete with our high-grade pigment applications in the region.”)).

519. “There is no question that Chinese-produced TiO₂ competes with North American-produced TiO₂ not only in other regions of the world but also in North America itself.” (Stern, Tr. 3841).

Response to Proposed Finding No. 519

The Proposed Finding cites to Mr. Stern for a factual observation about competition between Chinese produced TiO₂ and North American produced TiO₂. Respondents’ citation to Mr. Stern for this observations should be disregarded by the Court as citing to Mr. Stern for factual propositions that should be established by fact witnesses or documents, not through expert testimony. In that the only support for this Proposed Finding is the factual observation by Mr. Stern, it therefore should be disregarded.

Further, the statement is vague, incomplete, and therefore misleading. It is not clear whether Mr. Stern is referring to all TiO₂, or only certain products. As such, it is possible that he may be referring to Chinese-produced anatase grades, but that testimony would not be relevant.

In any event, if the finding were interpreted to be referring to Chinese manufactured sulfate or chloride TiO₂ in North America, it would be contrary to the overwhelming weight of the evidence that Chinese manufactured TiO₂ is not a close substitute that would prevent an exercise of market power by manufacturers of chloride TiO₂ sold in North America today. (CCFF ¶¶ 26-133, 748-54, 745, 786, 120).

520. In 2015, a leading paint and coatings industry trade magazine stated that “the speed at which Chinese pigment was brought to the world’s market is matched by the speed by which it has become accepted by formulators. Both phenomena have taken China’s international competitors by surprise.” (Stern, Tr. 3841-42; RX1181).

Response to Proposed Finding No. 520

The Proposed Finding relies on Mr. Stern to quote an article about “Chinese pigment.” Respondents’ citation to Mr. Stern for this observation should be disregarded by the Court as citing to Mr. Stern for a factual proposition that should be established by fact witnesses or documents,

not through expert testimony. In that the only support for this Proposed Finding is the factual observation by Mr. Stern, it therefore should be disregarded.

In any event, the Proposed Finding is simply a quote to a magazine article that on its face, is of limited relevance to competition in North America. It refers to “speed” of acceptance of Chinese TiO₂ by formulators, but does not make reference to regions, and to the extent Respondents suggest it applies to North America, the supposition would be contradicted by the real world evidence, provided by customers and others, and by Tronox’s public disclosures. Such evidence established that Chinese manufactured TiO₂ – whether chloride or sulfate - does not have a substantial competitive presence in North America. (CCFF ¶¶ 26-133, 748-54, 745, 786, 120).

Moreover, in making references to this article, Mr. Stern seems not to have taken into account that the article is based on information that is no longer accurate. It refers to abundant supplies of ilmenite in China, due to iron ore mining, (RX1181 at 0002 (“The high iron ore prices that prevailed when the magnitude of China’s construction boom took everyone by surprise have allowed some of the larger Chinese miners to produce very low-cost ilmenite”)), but in the period since this article was written, those supplies have greatly diminished due to the reductions in iron ore mining. (CCFF ¶¶ 771-72).

Further, to the extent that Tronox relies on this trade press as a probative and reliable source (even if the information in the article is no longer relevant), a much more recent article projected, right after the acquisition, that the Proposed Acquisition would increase “price discipline” among TiO₂ producers. (PX9026 (ICIS Chemical News) (“Insight: TiO₂ Consolidation Will Lead to More Price Discipline”)). Unlike the dated article that Tronox introduced in support of this Proposed Finding, and that relies on circumstances that have changed, PX9026 is consistent with

the observations of Tronox, Cristal and other TiO₂ producers regarding the impact of the Proposed Acquisition. (CCFF ¶¶ 704-27).

521. Tronox has lost business to Chinese suppliers “[i]n all regions of the world.” (Duvekot, Tr. 1343).

Response to Proposed Finding No. 521

The Proposed Finding is vague and incomplete, in that it provides no information regarding dimension such as time, volume, applications, or reasons for the asserted loss of business. Therefore, it carries no probative value to assess the effects of the proposed acquisition on the market for sales of chloride TiO₂ in North America. Further, to the extent this Proposed Finding implies that Chinese suppliers of chloride or sulfate TiO₂ provide a close enough substitute to prevent an exercise of market power among suppliers of chloride TiO₂ in North America, it is contrary to the weight of the evidence that Chinese sulfate grades are not effective substitutes, and further, that Chinese chloride TiO₂ producers are not effective potential entrants in the foreseeable future. (CCFF ¶¶ 26-133, 748-54, 745, 786, 120).

522. Chinese producers are a competitive threat to Tronox due to their rapid growth in capacity, improving quality, and low-cost production. (Engle, Tr. 2486). Tronox’s customers threaten to purchase more product from China instead of Tronox if Tronox does not compete with Chinese prices. (Turgeon, Tr. 2671).

Response to Proposed Finding No. 522

The Proposed Finding is vague and contrary to the weight of the evidence. It does not specify which customers “threaten” and whether those customers are in North America. Major North American customers testified that sulfate grades of TiO₂ manufactured in China are not a competitive alternative in North America, (CCFF ¶¶ 26-133), and that the quality of Chinese chloride grades is not adequate for their product requirements (CCFF ¶¶ 748-54). This testimony is consistent with the public disclosures of Tronox, (CCFF ¶¶ 745, 120) and also the testimony of

Kronos (CCFF ¶¶ 33,41) and Chemours (CCFF ¶¶ 230, 308), as well as even the testimony of certain of Respondents' witnesses, such as Brian Pickett of Cristal. (CCFF ¶ 385).

523. [REDACTED]

Response to Proposed Finding No. 523

The Proposed Finding is vague, incomplete, and misleading. As Complaint Counsel has described, the market for sales of chloride TiO₂ in North America already includes the small amounts of Chinese chloride TiO₂ that is sold in North America. (CCFF ¶¶ 384-86). Respondents did not describe in this Proposed Finding the extent to which the customers it has described have incorporated TiO₂ into products in North America.

To the extent that Respondents intend the Proposed Finding to suggest that chloride TiO₂ customers in North America could turn to increased purchases from China as a competitive constraint, that suggestion would be contrary to the weight of the evidence that Chinese manufactured sulfate grades are not competitive constraint. (CCFF ¶¶ 26-133), that Chinese chloride grades have a minimal presence in North America, (CCFF ¶¶ 385-89), and that quality issues would constrain expansion by Chinese chloride TiO₂ manufacturers in North America (CCFF ¶¶ 748-54, 745, 786, 120). As [REDACTED] in detail, [REDACTED]

[REDACTED] } (See CCFF ¶¶ 33, 36-38, 47, 51-52, 55, 63, 66, 70, 89, 107, 116, 126, 132, 749, 753, 779). [REDACTED] } (Turgeon, Tr. 2677 (*in camera*)).

Further, vague references to other customers { [REDACTED] } also have little weight. Tronox had every opportunity to call such customers as witnesses and { [REDACTED] }, but Tronox did not call any at the trial.

524. [REDACTED]

Response to Proposed Finding 524

The Proposed Finding is vague and misleading. It is based on { [REDACTED] }
[REDACTED]
[REDACTED] }
(Christian, Tr. 954 (*in camera*)). Despite the misleading nature of Respondents' Proposed Finding,
[REDACTED]
[REDACTED] } (CCFF ¶¶ 41, 122, 396
(*citing* Christian, Tr. 810-11 ({ [REDACTED] }) (*in camera*), 751 (Christian, Tr. 797 (“We just don’t see Chinese chloride in the markets in which we compete. I think the extremely minimal amount of Chinese [chloride TiO₂] product stays in lower and goes into lower quality products.”))).

525. [REDACTED]

Response to Proposed Finding No. 525

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence.

{ [REDACTED]

[REDACTED] }. (PX8000 at 004 (¶ 20) (Malichky Decl.) (*in camera*)).

{ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 749, 753; PX7025 (Malichky, Dep. at

241-42) ({ [REDACTED]

[REDACTED] }) (*in camera*)).

526. [REDACTED]

[REDACTED]

Response to Proposed Finding 526

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence.

{ [REDACTED]

[REDACTED]

[REDACTED] } (Malichky, Tr. 394 (*in camera*)), and further that, { [REDACTED]

[REDACTED]

[REDACTED] } (Malichky, Tr. 409 (*in camera*)). { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶¶ 35, 47, 55, 57, 66, 77, 88, 96, 108, 129).

Mr. Romano’s testimony is vague, since PPG has operations throughout the world. Moreover, it is contrary to the weight of the evidence—including the public disclosures that Tronox makes to investors—that Chinese manufactured TiO₂ is not a substantial competitive alternative to the chloride TiO₂ sold in North America. (CCFF ¶¶ 26-133, 385-89, 748-54, 745, 786, 120). Indeed, it is that substantial evidence, much more than the vague testimony of Mr. Romano, that is much more consistent with Mr. Romano’s informing PPG of its intent to increase price to PPG after the acquisition—because Cristal’s price was too low due to a lack of “market discipline” (both Mr. Romano and Mr. Moulard did know that { [REDACTED] [REDACTED] } (Malichky, Tr. 620-21 (*in camera*); Moulard, Tr. 1283-84 (*in camera*))—in a summer 2017 meeting with PPG executives, which Mr. Romano and Mr. Moulard attended on behalf of Tronox. (CCFF ¶¶ 699-700; Malichky, Tr. 279).

Finally, the cite to PPG’s discussions about terms in the second half of 2018 is incomplete and misleading. { [REDACTED] [REDACTED] } (Malichky, Tr. 317 (*in camera*)). { [REDACTED] [REDACTED] [REDACTED] } (Malichky, Tr. 319 (*in camera*)).

527. [REDACTED]

Response to Proposed Finding No. 527

The Proposed Finding is incomplete and misleading. { [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] }

[REDACTED] } (CCFF ¶¶
34, 49, 56, 124).

528. [REDACTED]

Response to Proposed Finding No. 528

For the reason described in Responses to Proposed Findings 473 and 515, the references to

{ [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (Pschaidt, Tr. 1020 ({ [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] }) (*in camera*)). Finally, Respondents' assertion that { [REDACTED]
[REDACTED]
[REDACTED] } It left out Mr. Pschaidt's observation that { [REDACTED]
[REDACTED] }

(Pschaidt, Tr. 1021 (*in camera*)).

None of Respondents' cited testimony undermines { [REDACTED]
[REDACTED]

██████████ } (CCFF ¶¶ 53-54, 64, 130).

C. TiO₂ Customers—Especially Big Global Companies—Have Significant Leverage, and Have Consolidated in Recent Years.

529. TiO₂ customers are often “large multi-international customers.” (Christian, Tr. 886). “Many of the customers [in the TiO₂ industry] are large multinational companies.” (Christian, Tr. 878-79). For Tronox, “well over half of our business is with the large, strategic, global multinationals.” (Romano, Tr. 2231).

Response to Proposed Finding No. 529

On its face, the Proposed Finding is incomplete and therefore potentially speculative and misleading. There are large customers for TiO₂, but there are also smaller customers. To the extent that this finding is intended by Respondents to emphasize larger customers as more meaningful, Respondents have provided no basis on which to do so.

530. Customers “have a lot of power in the titanium dioxide industry.” (Christian, Tr. 878). “Many of the customers [in the TiO₂ industry] are large multinational companies.” (Christian, Tr. 878-79). These large global customers “engage in very complex and strategic decisions in procuring their titanium dioxide.” (Christian, Tr. 886).

Response to Proposed Finding No. 530

The Proposed Finding is vague and misleading, in that the word “power” is vague subject to a wide variation variety of interpretations.

In any event, although Respondents cite to the testimony of Mr. Christian with respect to this Proposed Finding, the Proposed Finding is incomplete and misleading because a recent Kronos investor presentation (PX3011 at 038), which described “Structural Improvements” in TiO₂ that would lead to improved earnings, and Mr. Christian provide the correct description of the TiO₂ industry, explaining that in Kronos view, the structural improvements included consolidation and higher concentration among TiO₂ producers through the Tronox–Cristal transaction, which would “increase the likelihood that those [capacity] constraints would be present for a longer period of

time.” (CCFF ¶¶ 636, 722; Christian, Tr. 772 (“So what we were saying here is that the capacity constraints already existed at the time in the industry, and these potential -- and in some case these consolidations that we were seeing -- we think further increase the likelihood that those constraints would be present for a longer period of time.”)). His testimony in that regard was his own words, not something that was suggested to him in a leading question, and undercuts any suggestion by Respondents that Mr. Christian’s overall testimony supports a conclusion that buyer power and negotiations by customers would forestall adverse competitive effects. (See PX9085 at 030 (Horizontal Merger Guidelines, § 8)).

531. [REDACTED]

Response to Proposed Finding No. 531

The Proposed Finding is vague, incomplete, misleading, and contrary to the weight of the evidence. It may be accurate that TiO₂ prices are often negotiated. However, the citation to Mr. Pschaidt’s testimony mischaracterizes his testimony – { [REDACTED] [REDACTED] [REDACTED] } (Pschaidt, Tr. 1030 (*in camera*)). In any event, the fact that customers negotiate does not within the framework of the Merger Guidelines undermine the competitive concerns associated with the Proposed Acquisition. Instead, { [REDACTED] [REDACTED] [REDACTED] } (CCFF ¶ 715). Consistent with these concerns for example, there is abundant evidence in the record establishing the market characteristics that contribute to these concerns, such as { [REDACTED] [REDACTED] [REDACTED] } (CCFF ¶ 427), or

more generally, { [REDACTED] } (CCFF ¶¶ 443-44, 451, 454, 456-57, 528, 533).

532. Indeed, one “element” as to why the TiO₂ industry is cyclical is “because the customers have . . . significant strength.” (Christian, Tr. 881). This customer strength influences pricing of TiO₂. (Christian, Tr. 881).

Response to Proposed Finding No. 532

The Proposed Finding mischaracterizes the exchange between Tronox counsel and Mr. Christian and is vague, incomplete, and misleading. Tronox counsel on cross exam asked Mr. Christian to agree that “[p]art of the reason it’s a cyclical industry is because the customers have that significant strength. . .” to which Mr. Christian responded that the vague phrase “significant strength” was an “element” that contributed to the vague notion of “cyclicity.” Respondents’ Proposed Finding further omits one of the most important words in counsel’s question, which is where the sentence begins with “Part of . . .” All that Mr. Christian agreed to therefore, was that customer strength, whatever that vague term refers to, is part of the reason that the TiO₂ has some level of cyclicity. That mild observation is not surprising in any industry. And again, what Respondents completely ignore is Kronos’s expectation that the proposed acquisition, reducing the number of TiO₂ competitors and increasing consolidation, is likely to lead to an increased level of capacity constraints in TiO₂. (CCFF ¶ 636).

It also needs to be stated that Mr. Christian never testified that “customer strength influences the pricing of TiO₂,” the vague proposition for which he is cited, and none of the leading questions on page 881 of the transcript supports the proposition.

533. Many customers negotiate annual contracts with producers to govern terms of their purchases, but these contracts almost never set the price the customer must pay throughout the life of the contract. (Stern, Tr. 3727-29; *see also* Young, Tr. 710;). Instead, most contracts provide for *negotiated* prices and customers typically have the option under the contracts to switch

suppliers if they find a better price. (Stern, Tr. 3727-29; *see also* Young, Tr. 710; [REDACTED])

Response to Proposed Finding No. 533

The Proposed Finding is vague, misleading and contrary to the weight of the evidence. It is not clear what significance Respondents place on the fact of negotiations between TiO₂ producers and customers, but in any event, the fact of such negotiations tends at most to show some level of competition among TiO₂ producers. The existence of some level of competition is at the heart of the concern, articulated in the Complaint, that the merger may reduce that competition through increased coordination or unilateral effects. Further, the degree of negotiation depends on the ability of TiO₂ consumers to shift among different suppliers, and to the extent that the merger leads to increased capacity constraints or pricing discipline, it would reduce customer ability to negotiate. (CCFF ¶¶ 704-27 (projections by industry participants of anticompetitive effects of acquisition)). For example, when Tronox reduced production in order to stem price erosion, as described by Mr. Duvekot, (CCFF ¶ 427), that reduced customer ability to negotiate for lower prices. In describing Tronox's decision to reduce production, Mr. Duvekot himself explained that { [REDACTED]

[REDACTED] } (PX1435 at 001 (Duvekot email) (*in camera*); Duvekot, Tr. 1333-35 (*in camera*)).

Respondents also cite in this finding to meet or release clauses. Such clauses tend to increase the vulnerability of a market to coordinated interaction, by increasing visibility of competitive initiatives. (PX9085 at 028-30 (Horizontal Merger Guidelines, § 7.2)). In any event, it also should be noted here that [REDACTED]

(CCFF ¶ 508). Further, Respondents’ reference to the testimony of Mr. Young relating to meet or release provisions mischaracterizes his testimony. { [REDACTED]

[REDACTED] } (Young, Tr. 707 (*in camera*)).

534. There has been significant consolidation among TiO₂ customers in the paint and coatings segment over time. (Stern, Tr. 3847). In 2016 “the top ten global suppliers of paints and coatings represented more than 50 percent of the global market.” (Stern, Tr. 3487). The consolidation in the paint and coatings industry has affected TiO₂ pigment suppliers because it “confers greater buying power” to those customers. (Stern, Tr. 3847-48).

Response to Proposed Finding No. 534

The Proposed Finding is incomplete and vague and does not even attempt to apply Commission policy regarding buyer power. Respondents generally refer to “greater buying power,” citing the conclusory testimony of Mr. Stern, but neither Respondents, nor Mr. Stern, attempted to describe how buyer power in chloride TiO₂ would apply within the framework of the Horizontal Merger Guidelines:

“The Agencies do not presume that the presence of powerful buyers alone forestalls adverse competitive effects flowing from the merger. Even buyers that can negotiate favorable terms may be harmed by an increase in market power. The Agencies examine the choices available to powerful buyers and how those choices likely would change due to the merger. Normally a merger that eliminates a supplier whose presence contributed significantly to a buyer’s negotiating leverage will harm that buyer.”

(PX9085 at 030 (Horizontal Merger Guidelines, § 8)). In fact, consistent with the identified concern where a merger eliminates a significant supplier, there was record evidence relating to

{ [REDACTED] } (CCFF ¶¶ 514-25, 696-700).

Therefore, unlike the evidence in the record of Cristal’s impact on negotiations, which is directly relevant to the Merger Guidelines framework, Respondents’ description of buyer power had no connection to the Merger Guidelines framework, and instead simply reflected the conclusory statement of its paid expert Mr. Stern that buyer power generally “has affected TiO2 pigment suppliers.” (Stern, Tr. 3847). Moreover, even the largest customers testified that they usually have to accept all or part of announced price increases. (PX8000 at 003 (¶ 11) (Malichky Decl.) (“Even as one of the largest purchasers of TiO2 in the market, PPG has taken price increases quarterly from { [REDACTED] } with PPG’s TiO2 prices in the U.S. rising { [REDACTED] } over the period.”) (partially *in camera*); PX8003 at 002 (¶ 7) (Young Decl.) (“The price of TiO2 to our North American locations has been increasing for much of 2016 and into 2017, by about { [REDACTED] }% so far, and due to limited availability from North American suppliers, { [REDACTED] }”) (partially *in camera*); PX8006 at 003 (¶ 18) (Pschaidt Decl.) ({ [REDACTED] } [REDACTED] } (in camera)).

535. These large customers “continue to consolidate.” (Romano, Tr. 2231). For example, as recently as 2017, Sherwin Williams, a large multinational paint and coatings company, acquired Valspar, another large multinational paint and coatings company. (Young, Tr. 631). Now, Valspar is a key brand for Sherwin Williams. (Young, Tr. 631). [REDACTED]

Response to Proposed Finding No. 535

The Proposed Finding is accurate only for the unremarkable propositions that Sherwin-Williams acquired Valspar in 2017, and Sherwin-Williams believes that the Valspar brand is now

one of its key brands. The reference to PPG is vague, incomplete, and misleading. Mr. Malichky testified that in connection with acquisitions, [REDACTED]

[REDACTED]

[REDACTED] } (Malichky, Tr. 400 ([REDACTED]

[REDACTED]

[REDACTED] }) (*in camera*)).

536. The paint companies already have considerable power—PPG Industries (“PPG”), one of Tronox’s customers, is one of the largest paint and coatings companies in the world. (Malichky, Tr. 267-69; 343). [REDACTED]

[REDACTED] These sales are [REDACTED] times the size of Tronox’s annual global sales, which are approximately \$1.49 billion. (PX9053-012). In the United States, PPG sells architectural paint under the brand names Glidden, Pittsburgh Paint, Manor Hall, Liquid Nails, and others. (Malichky, Tr. 269). PPG also sells paint for industrial applications, like painting bridges or cars or airplanes. (Malichky, Tr. 269-70). [REDACTED]

[REDACTED]

Response to Proposed Finding No. 536

The Proposed Finding is vague and misleading, beginning with the use of the word “power,” continuing through the phrase “significant influence,” and through to the end. It is also contrary to the weight of the evidence.

The use of the vague and conclusory terms does not substitute for assessing the specific facts identified in the Horizontal Merger Guidelines that relate to whether a proposed acquisition raises competitive concern. As Mr. Malichky described, in a summer 2017 meeting with PPG

executives, which Mr. Romano and Mr. Mouland attended on behalf of Tronox (Malichky, Tr. 279), Mr. Romano has already informed PPG of its intention to increase price as a result of the acquisition, an indicator that PPG's "significant influence" is not what Respondents suggest in this Proposed Finding. (CCFF ¶¶ 699-700).

The fact of 90-day price protection is simply a practice adopted in the industry that firms take into account in making price changes. An effect of this practice is that price changes are communicated in advance, so this is among the array of factors that provide TiO₂ producers with visibility into price increases by competitors. (CCFF ¶¶ 460-85). These sorts of practice, as well as meet or release clauses such as the one emphasized by Respondents in this Proposed Finding tend to make a market more vulnerable to coordination, by increasing market transparency. (*See* PX9085 at 028-30 (Horizontal Merger Guidelines, § 7.2)).

537. Sherwin Williams another global paint and coatings company and a key customer purchasing large quantities of TiO₂, produces architectural (consumer) paints as well as industrial coatings, used for automotives, marine uses, coils, and other industrial applications. (Young, Tr. 631).⁶² Sherwin Williams' primary brand carries the company's own name. (Young, Tr. 631). Other key brands include recently-acquired Valspar as well as Dutch Boy and Cabot. (Young, Tr. 631). Sherwin Williams sells its products globally, in the Americas, Europe, Asia, Australia, South Africa, and India, and it manufactures its products in all of the same locations, except India. (Young, Tr. 632). In North America, Sherwin Williams is the largest producer of coatings. (Young Tr. 633).

Response to Proposed Finding No. 537

To the extent that this Proposed Finding provides facts about Sherwin-Williams, Complaint Counsel has no specific response.

538. Masco Coatings Corporation ("Masco") is yet another a large-scale TiO₂ customer in the paints and coatings industry. Masco produces paint for architectural coatings, like interior and exterior house paint. (Pschaidt, Tr. 963). Masco sells its paint under the brand names Behr

⁶² A representative from Sherwin Williams, Mr. Young, testified at the trial, after providing prepared statements written at the FTC's direction, and after three phone calls with the FTC prior to his deposition. (Young, Tr. 700).

and Kilz. (Pschaidt, Tr. 966).⁶³ [REDACTED]

Response to Proposed Finding No. 538

The Proposed Finding is incomplete and misleading and contrary to the weight of the evidence, for reasons already described in Response to Proposed Findings 473 and 528, which also discussed Masco and also mischaracterized the testimony of Mr. Pschaidt. (See CCRRFF ¶¶ 473, 528, above).

539. True Value is another key customer of TiO₂ producers like Tronox and Cristal. True Value is a hardware co-op business that includes a vertically-integrated paint business, meaning that True Value both manufactures paint and sells that paint through its hardware co-op stores. (Vanderpool, Tr. 157). True Value sells its paint at 2000 stores in the United States. (Vanderpool, Tr. 180). True Value also manufactures some paint for other companies. (Vanderpool, Tr. 185). True Value relies on a global sourcing team to track the availability of the raw materials True Value needs to purchase. (Vanderpool, Tr. 222). [REDACTED]

Response to Proposed Finding No. 539

The Proposed Finding is vague and misleading to the extent that it suggests that True Value makes TiO₂ sourcing decisions on a global basis. True Value's "global sourcing team" only "tracks" raw materials only to the extent it gets reports about what True Value is buying. (Vanderpool, Tr. 222). In that respect, [REDACTED]

⁶³ Interestingly, in the Kilz primer, the resin is the ingredient that makes the product effect, rather than TiO₂, which is "complementary." (Pschaidt, Tr. 969).

[REDACTED] } (CCFF ¶¶ 34, 47, 116, 124-25, 132, 747, 792).

VIII. THE PROPOSED TRANSACTION WILL NOT LEAD TO UNILATERAL ANTI-COMPETITIVE EFFECTS.

540. The Tronox-Cristal transaction “does not present prospects for likely unilateral anticompetitive effects.” (Shehadeh, Tr. 3201; 3329). This is true both for the global market for rutile TiO₂, as well as “in the context of the models that Dr. Hill presented, which are limited to the market that he is proposing, sales to customers in North America.” (Shehadeh, Tr. 3201-02).

Response to Proposed Finding No. 540

The Proposed Finding is vague, misleading, incomplete and contrary to the weight of the evidence. The weight of the evidence, including Tronox’s own documents and public statements, indicate that unilateral competitive effects are likely to occur. (CCFF ¶¶ 551-694; PX5000 at 69-91 (¶¶ 159-209) (Hill Initial Report) (*in camera*)). Dr. Hill reviewed and relied upon both the qualitative and quantitative evidence (Hill, Tr. 1661) and concluded that the proposed transaction “is likely to have both unilateral and coordinated anticompetitive effects.” (Hill, Tr. 1666).

A. Neither Tronox Nor Other Producers Have a History of Withholding TiO₂ Output to Influence Market Prices.

541. Tronox has never “reduced output [of TiO₂] in order to drive up prices of pigment.” (Romano, Tr. 2253).⁶⁴ Tronox has also never attempted to control the supply or price of TiO₂ feedstock to raise the price of pigment. (Romano, Tr. 2254).

Response to Proposed Finding No. 541

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Tronox documents acknowledge that their supply decisions support higher pricing. (CCFF ¶¶ 586-635; PX5000 at 075-85 (¶¶ 179-188) (Hill Initial Report) (*in camera*); Hill, Tr. 1822-25 (*in camera*)). Indeed, Tronox stated explicitly that { [REDACTED]

⁶⁴ Mr. Romano’s testimony is based on his 30 years of experience with Tronox and direct knowledge of decisions to reduce output of TiO₂. (Romano, Tr. 2247-48, 2253).

[REDACTED] } (PX1435 at 001 (Duvekot email) (*in camera*); Duvekot, Tr. 1333-35 (*in camera*)). Furthermore, on numerous occasions, Tronox publicly stated that it was “managing our production” so that “price will rise” and that Tronox planned to take “a very disciplined approach to production...” (PX9007 at 005 (Q1 2015 Tronox earnings call); PX9005 at 010 (Q3 2015 Tronox earnings call); PX9003 at 010-11 (Q1 2016 Tronox earnings call); PX5000 at 075-78 (¶¶ 179-81) (Hill Initial Report) (*in camera*); Hill, Tr. 1822-25 (*in camera*)). For example, on a May 2015 earnings call, Mr. Casey stated that it was Tronox’s “view that an upward move in pigment selling prices will be predicated on a reduction of supply in the pigment market relative to demand, and/or an upward move in feedstock selling prices and we expect to see both.” (PX9007 at 005 (Q1 2015 Tronox earnings call)).

542. Tronox has only temporarily reduced its TiO₂ production during periods of historically low demand, when inventories were excessive and credit agencies were downgrading Tronox’s bonds. (Arndt, Tr. 1402-03). When Tronox has reduced production, it did not decrease sales, increase prices, or increase profits. (Romano, Tr. 2251-53; 2169-70). At the times Tronox reduced production, including 2012 and 2015, Tronox was “fighting” for “survival.” (Arndt, Tr. 1416).

Response to Proposed Finding No. 542

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. (PX5000 at 075-85 (¶¶ 179-88) (Hill Initial Report) (*in camera*); CCF ¶¶ 586-618). During 2012, 2013, and 2014, Tronox { [REDACTED] } (CCFF ¶¶ 600, 604; PX5002 at 006 (¶ 9) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). Then again in 2015 Tronox { [REDACTED] } (CCFF ¶ 608; PX7007 (Van Niekerk, Dep. at 064) (*in camera*)). A Tronox executive explained that { [REDACTED] }

[REDACTED] } (CCFF ¶ 611; PX1435 at 001 (Duvekot/Bianchi email chain) (in camera)).

543. Of course, there are times where Tronox, like every TiO₂ producer, has to temporarily reduce its production or output for “maintenance, unplanned and planned.” (Romano, Tr. 2252). At these times, Tronox will have to “slow the plant down to do the maintenance.” (Romano, Tr. 2252).

Response to Proposed Finding No. 543

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence, to the extent that it suggests Tronox and other TiO₂ producers cannot have more than one reason for reducing production or output. TiO₂ producers can reduce production or output for maintenance and to affect the price of TiO₂ at the same time. (PX5002 at 006-07 (¶ 9) (Hill Rebuttal Report to Stern and Imburgia) (showing that { [REDACTED]

[REDACTED] } (in camera)). At trial, John Romano admitted that Tronox has reduced output for purposes other than maintenance or unplanned outages. (Romano, Tr. 2250). Furthermore, when Tronox has performed maintenance on their plants, they have not always brought them back to full capacity, making maintenance and withholding compatible strategies. (CCFF ¶ 575).

a. On a Handful of Occasions, Tronox Has Been Forced by Severe Market Conditions and Unsustainable Financials to Temporarily Reduce TiO₂ Production.

544. The period of 2008-2009 was a difficult period for Tronox, as well as many of its competitors. (Stern, Tr. 3742). In 2008, “there was a global credit crisis and demand fell off and we had to reduce the production output to avoid large volumes in inventory.” (Duvekot, Tr. 1342). Tronox declared bankruptcy in January 2009. (Stern, Tr. 3742-43). During the bankruptcy process, Tronox was forced to close its Savannah, Georgia plant due to the plant’s inability to run “within [its] own cash flow.” (Romano, Tr. 2249; Dean, Tr. 2947). [REDACTED]

Response to Proposed Finding No. 544

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence.

{ [REDACTED] } (Romano, Tr. 2208-11 ({ [REDACTED] } (in camera); Christian, Tr. 961; PX5000 at 029 (¶66) (Hill Initial Report (in camera)). When Tronox closed the Savannah Georgia plant, it { [REDACTED] } and emphasized that { [REDACTED] } (CCFF ¶¶ 590-91; PX1486 at 004 (Tronox presentation) (in camera); Romano, Tr. 2164-65 (in camera) PX1299 at 001 (Engle email) (in camera)).

545. [REDACTED]

Response to Proposed Finding No. 545

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Cristal recognizes that { [REDACTED] } (CCFF ¶¶ 619-30; PX2000 at 007 (Cristal presentation) (in camera)). In 2011, Cristal commented on the success of this output reduction strategy, stating, “[t]he pricing momentum began when significant major capacity was taken offline in 2008 and 2009 during the Financial Crisis. More than 300,000mt of capacity came off-line in that period, including Le Havre and Hawkins Point.” (PX2083 at 001 (Stoll email)). After prices rose dramatically in 2011, Cristal considered reopening the Hawkins Point Plant but Mark Stoll cautioned, “the only certain factor is that the market will remain tighter with greater pricing power the longer we leave [Hawkins

Point Plant] down and further capacity recovery will only act to stabilize upward pricing dynamics.” (PX2022 at 006 (Cristal presentation)).

546. In addition to the 100,000 tons of TiO₂ that were taken out of the market by the closure of Tronox’s Savannah plant, an additional 280,000 tons were taken out of the market by other TiO₂ producers due to poor market conditions. (Romano, Tr. 2249-50).

Response to Proposed Finding No. 546

The Proposed Finding is vague and incomplete in its use of the term “poor market conditions.” The Proposed Finding is also misleading and incomplete in that { [REDACTED] } (PX1299 at 001 (Engle email (*in camera*); CCF ¶¶ 591-592).

547. In 2012, Tronox was forced to temporarily reduce its TiO₂ output because “from 2011 to 2012, our total sales profile dropped 21 percent year over year.” (Romano, Tr. 2250-51).⁶⁵ As Mr. Romano explained: “In the fourth quarter of ’11, it dropped 43 percent in Asia Pacific. We had to evaluate how we were going to move forward. Customers weren’t interested in buying at any price at that stage because we had just—we were—that was the back end of the cycle, so prices at that stage had peaked. And they had peaked largely due to an exacerbated impact [of] panic buying, so we had some instances where we had very large customers . . . that had over 12 months of inventory. So in an effort to manage cash, we couldn’t just continue to build inventory. We had nowhere to put the inventory. We made a decision to slow the plant down.” (Romano, Tr. 2250-51). In 2012, worldwide demand in the TiO₂ industry “declined precipitously.” (Arndt, Tr. 1397, 1400). It declined worldwide “by approximately 20 percent over a very, very short period of time.” (Arndt, Tr. 1397).⁶⁶

Response to Proposed Finding No. 547

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Tronox recognizes that withholding chloride TiO₂ output supports higher prices. (CCFF ¶¶ 568-576). { [REDACTED] }

⁶⁵ Mr. Romano was personally involved in Tronox’s decisions to temporarily reduce output in 2012 and 2015. (Romano, Tr. 2247-48).

⁶⁶ This worldwide decline in demand refers to demand of titanium dioxide, without any distinction between chloride-process or sulfate-process TiO₂. (Arndt, Tr. 1410-11).

(CCFF ¶¶ 593-600). Tronox { [REDACTED] } (CCFF ¶ 600). { [REDACTED] } (PX1075 at 001 (Hinman/Casey email chain) (*in camera*)). In a 2012 market update, Tronox explained that { [REDACTED] } (PX1109 at 011 (Tronox presentation) (*in camera*)).

548. Tronox was forced to temporarily reduce TiO2 and feedstock production in 2012 because it had “significant excess inventory.” (Arndt, Tr. 1400). “[B]y July and August of that year, 2012, we were carrying twice—in fact, a little bit more than twice a normal level of inventory both at pigment, and then when you turn a pigment plant down, you require less feedstock, so inventory was building at both levels of our value chain.” (Arndt, Tr. 1400).

Response to Proposed Finding No. 548

The Proposed Finding is not supported by the evidence cited. As Tronox’s vice president of investor relations, Mr. Arndt is “not involved in the operations side of Tronox’ functions” and is not qualified to discuss Tronox’s production decisions. (Arndt, Tr. at 1353, 1424).

The Proposed Finding is also misleading, incomplete and contrary to the weight of the evidence. Tronox’s recognizes that withholding chloride TiO2 output supports higher prices. (CCFF ¶¶ 568-76). { [REDACTED] } (CCFF ¶¶ 595-600). { [REDACTED] } (PX1025 at 002 (Santos email to Casey) (*in camera*)). { [REDACTED] }

[REDACTED].} (PX5002 at 006 (¶ 9) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). Furthermore, Tronox’s excess feedstock was due to Tronox lowering its own pigment production. (Arndt, Tr. 1400).

549. Although Tronox temporarily reduced output of TiO₂ in 2012, price continued to move down for the succeeding four years. (Romano, Tr. 2250-51).

Response to Proposed Finding No. 549

The Proposed Finding is misleading and not supported by the evidence in that it implies a causal link between Tronox’s output reduction and the market price decline when no such link is supported by the evidence. The parties acknowledge that withholding output puts upward pressure on prices. (CCFF ¶¶ 569-85). Indeed, Tronox has withheld output during periods of declining prices in order to slow or halt the reduction of prices. (PX1435 at 001 (Duvekot email) (*in camera*); PX1075 at 001 (Hinman/Casey email chain) (*in camera*); CCFF ¶¶ 587-612). Moreover, { [REDACTED] } (CCFF ¶¶ 601-12). For example, { [REDACTED] } (PX5002 at 006 (¶ 9) (Hill Rebuttal Report) (*in camera*)). During this time, { [REDACTED] } (PX5002 at 006 (¶ 9) (Hill Rebuttal Report) (*in camera*)).

550. In 2015, Tronox was forced to temporarily reduce its TiO₂ output because the TiO₂ market was in a “very, very tough situation.” (Turgeon, Tr. 2637). The industry was “in a crisis” in 2015. (Turgeon, Tr. 2667-68). 2015 was “the worst market conditions,” or “annus horribilis.” (Arndt, Tr. 1401).

Response to Proposed Finding No. 550

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence because it fails to acknowledge that { [REDACTED] }

[REDACTED] (CCFF ¶¶ 605-12).

Tronox idled supply at its Hamilton and Kwinana plants and [REDACTED]

[REDACTED] (CCFF ¶¶ 607, 609; PX7001 (Romano, IHT at 167) (*in camera*); PX7026

(Duvekot, Dep. at 148-49) (*in camera*)). While these curtailments caused Tronox to absorb about \$30 million in fixed costs, the company found the benefits from doing so to outweigh the costs.

(CCFF ¶ 608; PX9003 at 011(Tronox Q1 2016 Earnings Call)). [REDACTED]

[REDACTED] } (CCFF ¶ 612; PX5002 at 006 (¶ 9 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in*

camera)). The Proposed Finding also uses vague terms such as “very, very tough situation” and

“worst market conditions.”

551. In 2015, Tronox was in the midst of a “long period of downturn” in the TiO₂ industry that lasted from approximately 2012 to 2016, in large part “because the supply was higher than the demand.” (Turgeon, Tr. 2637). In 2015, Tronox was reporting losses in “each and every quarter.” (Arndt, Tr. 1401). Tronox was “running our asset[s] at cost.” (Turgeon, Tr. 2637). “[T]here was an oversupply of material, and the demand had kind of collapse[d], specifically in the second half of 2015.” (Turgeon, Tr. 2637). Tronox’s inventory levels were “very high.” (Turgeon, Tr. 2637). Tronox “had close to a billion dollar of inventory, most of it being finished good,” which was an “unacceptable business situation at the time.” (Turgeon, Tr. 2637). The excess in inventory at Tronox was causing “significant financial penalties,” as Tronox “had significant cash locked up in that finished TiO₂ pigment and finished TiO₂ feedstock sitting on the ground around the world.” (Arndt, Tr. 1401-02).

Response to Proposed Finding No. 551

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence because it fails to acknowledge that Tronox reduced its North American chloride TiO₂ output in 2015 in order to support higher North American chloride TiO₂ prices. (CCFF ¶¶ 605-12). [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶ 612; PX5002 at 006 (¶ 9 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). Tronox idled supply at its Hamilton and Kwinana plants and { [REDACTED]

[REDACTED] } (CCFF ¶¶ 607, 609; PX7001 (Romano, IHT at 167) (*in camera*); PX7026 (Duvekot, Dep. at 148-49) (*in camera*)). While these curtailments caused Tronox to absorb about \$30 million in fixed costs, the company found the benefits from doing so to outweigh the costs. (CCFF ¶ 608; PX9003 at 011(Tronox Q1 2016 Earnings Call)). This is consistent with Tronox’ CEO’s public statement that operating at 80 percent capacity utilization is “not an uncomfortable position for us. Obviously we would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it.” (PX9033 at 012 (Tronox Q2 2012 Earnings Call)).

552. The period at the end of 2015 and beginning of 2016 was the bottom of the trough in the extended four-year cyclical downturn—demand was weak; prices were weak; inventories were too high. (Stern, Tr. 3754-55). “Tronox didn’t experience any unmet demand on the part of its customers” when output production declined; instead, Tronox’s “inventory levels were growing during this period of time.” (Stern, Tr. 3756-57; Arndt, Tr. 1402-04).

Response to Proposed Finding No. 552

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Tronox’s own documents during this time period claimed they were { [REDACTED] } (PX1435 at 001 (Duvekot email) (*in camera*); CCFF ¶ 611). Similarly, Mr. Duvekot of Tronox testified that { [REDACTED] } (Duvekot, Tr. 1333-35 (*in camera*)). { [REDACTED]

[REDACTED]

[REDACTED] } (CCFF ¶ 612; PX5002 at 006 (¶ 9 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)).

553. In 2015, market prices for TiO₂ were at their lowest point in at least the preceding 28 years. (Turgeon, Tr. 2638). Mr. Turgeon “never thought it would reach such a low level.” (Turgeon, Tr. 2638). From approximately 2012 to 2016, there was a steady decline in prices through the end of 2015, into 2016, for both Cristal and Tronox. (Arndt, Tr. 1399-1402; Stern, Tr. 3771). The continuing decline in TiO₂ prices between 2012 and 2016 demonstrates that, in the face of output reduction by suppliers, supply still “outstripped demand, leading to a weak pricing environment and producers who were struggling to reduce supply by trying to reduce inventory.” (Stern, Tr. 3771).

Response to Proposed Finding No. 553

The Proposed Finding is misleading, incomplete and vague in that it does not identify a region of the world. The Proposed Finding is also factually inaccurate and contrary to the weight of the evidence. Mr. Stern’s own report in Figure 16 suggests that { [REDACTED] [REDACTED] [REDACTED] }. (RX0171 at 052 (Stern expert report) (*in camera*)).

554. Mr. Romano explained the market conditions that forced Tronox to temporarily reduce TiO₂ production in 2015: “[W]e were basically evaluating the same circumstances we were in 2012, although it was a bit different because price was significantly lower than it was at that stage. In 2015, at that stage, you have to remember we were now three years into a down cycle. We had been trying to move the price up. As I mentioned in earlier testimony, we’d made announcements in March of 2015, trying to get additional profitability based on what we saw as far as demand. So demand wasn’t in the same shape, but our profitability was very bad. So we were looking at how we could manage cash. We didn’t have enough cash to continue to build inventory, so we slowed the plant down.” (Romano, Tr. 2250-52).

Response to Proposed Finding No. 554

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence because it fails to acknowledge that Tronox reduced its North American chloride TiO₂ output in 2015 in order to support higher North American chloride TiO₂ prices. (CCFF ¶¶ 605-12). Tronox idled supply at its Hamilton and Kwinana plants and { [REDACTED] [REDACTED] [REDACTED] }

{ (CCFF ¶¶ 607, 609; PX7001 (Romano, IHT at 167) (*in camera*); PX7026 (Duvekot, Dep. at 148-49) (*in camera*)). While these curtailments caused Tronox to absorb about \$30 million in fixed costs, the company found the benefits from doing so to outweigh the costs. (CCFF ¶ 608; PX9003 at 011(Tronox Q1 2016 Earnings Call)). {

} (CCFF ¶ 612; PX5002 at 006 (¶9 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)).

555. After March 2015, TiO₂ “[p]rice continued to move down for a full year.” (Romano, Tr. 2226).

Response to Proposed Finding No. 555

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence in that it implies a causal link where no such link is supported. The parties acknowledge many times that withholding output puts upward pressure on prices. (CCFF ¶¶ 569-85). For example, Tronox explicitly stated that {“ } (PX1435 at 001 (Duvekot email) (*in camera*); Duvekot, Tr. 1333-35 (*in camera*)). Tronox reaffirmed this strategy publically in a 2015 earnings call, when CEO John Casey stated that Tronox is “managing [its] production so that inventories get reduced to normal or below normal levels. And when that happens price will rise... From what we see with Chemours and Huntsman and presumably the others as well, they’re doing the same thing. We see them acting in the same way.” (PX9005 at 010 (Tronox Q3 2015 Earnings Call)).

556. Tronox had to temporarily reduce output of TiO₂ in 2015 “when the company was in a dire financial situation and we had to reduce the output just to stop the bleeding.” (Duvekot, Tr. 1342).

Response to Proposed Finding No. 556

This Proposed Finding’s use of “dire financial situation” is vague. Additionally, the Proposed Finding is misleading, incomplete and contrary to the weight of the evidence because it fails to mention that Tronox reduced its North American chloride TiO₂ output in 2015 in order to support higher North American chloride TiO₂ prices. (CCFF ¶¶ 605-12). Tronox idled supply at its Hamilton and Kwinana plants and { [REDACTED] }
 { [REDACTED] }
 (CCFF ¶¶ 607, 609; PX7001 (Romano, IHT at 167) (*in camera*); PX7026 (Duvekot, Dep. at 148-49) (*in camera*)). While these curtailments caused Tronox to absorb about \$30 million in fixed costs, the company found the benefits from doing so to outweigh the costs. (CCFF ¶ 608; PX9003 at 011(Tronox Q1 2016 Earnings Call)). { [REDACTED] }
 { [REDACTED] }
 { [REDACTED] } (CCFF ¶ 612; PX5002 at 006 (¶9 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). Furthermore, in 2015 Tronox was in { [REDACTED] } { [REDACTED] }
 { [REDACTED] } PX7024 (Harper, Dep. at 33-34, 47) (*in camera*); PX1578 at 001 (Arndt email); PX1579 at 008 (Tronox presentation) (*in camera*)).

557. Mr. Turgeon put it bluntly: “[W]e would have gone to bankruptcy if we had continue on the path that we were [on].” (Turgeon, Tr. 2638).

Response to Proposed Finding No. 557

The Proposed Findings is misleading, incomplete and contrary to the weight of the evidence. Contrary to Mr. Turgeon’s testimony, Tronox’s then CFO Katherine Harper acknowledged that in 2015 Tronox was in a { [REDACTED] } { [REDACTED] }

{ [REDACTED] } PX7024 (Harper, Dep. at 33-34, 47) (*in camera*); PX1578 at 001 (Arndt email)). Internal Tronox documents support that in 2015 Tronox was in a strong liquidity position. (PX1578 at 001 (Arndt email); PX1579 at 008 (Tronox presentation) (*in camera*)).

The Proposed Finding also fails to mention that during this time-period Tronox reduced its North American chloride TiO₂ output in 2015 in order to support higher North American chloride TiO₂ prices. (CCFF ¶¶ 605-12). Tronox idled supply at its Hamilton and Kwinana plants and { [REDACTED] } (CCFF ¶¶ 607, 609; PX7001 (Romano, IHT at 167) (*in camera*); PX7026 (Duvekot, Dep. at 148-49) (*in camera*)). While these curtailments caused Tronox to absorb about \$30 million in fixed costs, the company found the benefits from doing so to outweigh the costs. (CCFF ¶ 608; PX9003 at 011(Tronox Q1 2016 Earnings Call)). { [REDACTED] } { [REDACTED] } { [REDACTED] } (CCFF ¶ 612; PX5002 at 006 (¶9 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)).

558. On the TiO₂ pigment side, Tronox temporarily “shut down two line[s] in Hamilton and we shut down a line in Kwinana.” (Turgeon, Tr. 2648). Tronox was also forced to reduce production of TiO₂ feedstock in 2015 due to low demand and building inventory. (Romano, Tr. 2253). On the TiO₂ feedstock side, Tronox “shut down one furnace at Namakwa Sands in the west side and one furnace at KZN in the east side.” (Turgeon, Tr. 2648). Tronox did this “because, again, we were producing more than we could sell, and our inventory was maxed out, so we had no option.” (Turgeon, Tr. 2648).

Response to Proposed Finding No. 558

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence because it fails to mention that Tronox reduced its North American chloride TiO₂ output in 2015 in order to support higher North American chloride TiO₂ prices. (CCFF ¶¶ 605-12). Tronox idled

supply at its Hamilton and Kwinana plants and { [REDACTED] }
 [REDACTED]
 [REDACTED] } (CCFF ¶¶ 607, 609; PX7001 (Romano, IHT at 167) (*in camera*); PX7026 (Duvekot, Dep. at 148-49) (*in camera*)). While these curtailments caused Tronox to absorb about \$30 million in fixed costs, the company found the benefits from doing so to outweigh the costs. (CCFF ¶ 608; PX9003 at 011(Tronox Q1 2016 Earnings Call)). { [REDACTED] }
 [REDACTED]
 [REDACTED] } (CCFF ¶ 612; PX5002 at 006 (¶9 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)).

Furthermore, the finding is misleading because it fails to mention that the reduction in feedstock demand was driven in part by Tronox themselves reducing pigment output, { [REDACTED] }
 [REDACTED] } (CCFF ¶¶ 606-10).

559. Tronox, like other TiO₂ producers, had no real option to address these market circumstances other than to temporarily reduce output of TiO₂ in an effort to stop the growth of their own inventories: “[Y]ou can’t take the product and ... dump it in the ocean. You can’t drink it. It’s either you sell it or you stop making it.” (Stern, Tr. 3747). “[T]he only lever that they have is reducing production.” (Stern, Tr. 3747; *see also* Turgeon, Tr. 2637-39, 2648-49).

Response to Proposed Finding No. 559

The Proposed Finding is not supported by the evidence cited because Mr. Stern lacks the experience necessary to discuss the production or marketing of TiO₂. (Stern, Tr. 3855-59). By Mr. Stern’s own admission, he has no experience in running a TiO₂ plant or in marketing TiO₂. (Stern, Tr. 3855-59). The Proposed Finding is also misleading, incomplete and contrary to the weight of the evidence. During this time-period, Tronox was { [REDACTED] }
 [REDACTED] } (PX5002 at 006 (¶ 9) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)).
 [REDACTED]

[REDACTED] } (PX5002 at 006 (¶ 9) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)).

560. Tronox did not temporarily reduce output to drive prices; rather, it sought only to manage Tronox’s “profitability or lack thereof” in light of unsustainably weak demand, low prices, limited cash flows, and excessive inventory. (Romano, Tr. 2251-52). Tronox reduced output temporarily because “we need[ed] to survive as a company.” (Turgeon, Tr. 2638).

Response to Proposed Finding No. 560

The Proposed Finding is contrary to the weight of the evidence. Tronox reduced its North American chloride TiO₂ output in 2015 in order to support North American chloride prices. (CCFF ¶¶ 605-10). Tronox stated explicitly that [REDACTED]

[REDACTED] } (PX1435 at 001 (Duvekot email) (*in camera*); Duvekot, Tr. 1333-35 (*in camera*)). In a 2015 earnings call, Tronox’s then CEO, Tom Casey stated publicly “It is our view that an upward move in pigment selling prices will be predicated on a reduction of supply in the pigment market relative to demand, and/or an upward move in feedstock selling prices and we expect to see both.” (PX9007 at 005 (Tronox Q1 2015 Earnings Call)). Later that year, Mr. Casey reiterated this position in another public earnings call saying, “And then the question is when will [the prices] turn. We’re addressing that by managing our production, so that inventories get reduced to normal or below normal levels; and when that happens, prices will rise.” (PX9005 at 10 (Tronox Q3 2015 Earnings Call)).

561. Tronox only made the decision to halt the production lines and furnaces because at the time Tronox was selling product below the cost of production, which was unsustainable for the business. (Turgeon, Tr. 2649). The decision to idle a production line is “never easy” to make in an industry with “high fixed costs.” (Turgeon, Tr. 2650). It is generally desired to “produce as much as possible because that’s how you can lower your cost.” (Turgeon, Tr. 2650). The decision to idle was only made when inventory reached point where stockpiles and warehouses were full. (Turgeon, Tr. 2650).

Response to Proposed Finding No. 561

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. Tronox reduced its North American chloride TiO₂ output in 2015 in order to support North American chloride prices. (CCFF ¶¶ 605-12). According to Tronox’s CEO, operating at 80 percent capacity utilization is “not an uncomfortable position for us. Obviously we would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it.” (PX9033 at 012 (Tronox Q2 2012 Earnings Call)). Consistent with that statement, at this time of low utilization { [REDACTED] } (PX5002 at 006 (¶ 9) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). Furthermore, the last sentence of the Proposed Finding is not supported by the cited testimony, which does not say anything about the timing of the decision to idle capacity. (Turgeon, Tr. 2650).

562. Even though Tronox reduced production at this time, Tronox still “maintain[ed] our sales” by “sell[ing] more out of inventory.” (Turgeon, Tr. 2649-50). “[O]ne thing is clear; we shut down production, but we never stopped selling.” (Turgeon, Tr. 2648-49).

Response to Proposed Finding No. 562

The Proposed Finding is inaccurate, incomplete and contrary to the weight of the evidence. Tronox told customers { [REDACTED] } (PX1435 at 001 (Duvekot email) (*in camera*)). Duvekot testified that { [REDACTED] } (Duvekot, Tr. 1333-35 (*in camera*)).

563. Global prices of TiO₂ were still falling when Tronox brought its pigment production lines back to full capacity, but Tronox restarted its pigment lines, anyway, because inventory had fallen back to “normal” levels. It was always Tronox’s intention to restart the plants as soon as inventory normalized as to not miss any opportunity for sales. (Turgeon, Tr. 2652-53).

Response to Proposed Finding No. 563

The Proposed Finding is misleading and incomplete in that another reason Tronox reduced output was to raise prices. (CCFF ¶¶ 606-10). It is also misleading in that { [REDACTED] } (PX5000 at 064 (Hill Initial Report) *(in camera)*); PX5002 at 006 (¶ 9) (Hill Rebuttal Report to Stern and Imburgia) *(in camera)*). This Proposed Finding is incomplete because it does not discuss Tronox' intention to continue to manage production. In its Q1 2016 earnings call, Mr. Casey emphasized that Tronox would seek to manage production at its Hamilton plant in a disciplined manner: "We believe that a very disciplined approach to production, to managing supply relative to demand, is what has facilitated the recovery in our markets, and we intend to continue to be disciplined about that. So, we don't intend to bring back the full production instantaneously simply because we see the very first signs of price recovery." (PX9003 at 010 (Tronox Q1 2016 Earnings Call)).

564. After the 2015 idling, Tronox brought all its pigment lines back to full production by the second quarter of 2016 and brought all its smelting facilities to full production by the beginning of 2017. Since being brought back into production, all smelting and pigment facilities have been running at full capacity. (Turgeon, Tr. 2652).

Response to Proposed Finding No. 564

The Proposed Finding is incomplete and misleading to the extent that it insinuates that Tronox will continue to run at full capacity. In its Q1 2016 earnings call, Mr. Casey emphasized that Tronox would seek to manage production at its Hamilton plant in a disciplined manner: "We believe that a very disciplined approach to production, to managing supply relative to demand, is what has facilitated the recovery in our markets, and we intend to continue to be disciplined about that. So, we don't intend to bring back the full production instantaneously simply because we see the very first signs of price recovery." (PX9003 at 010 (Tronox Q1 2016 Earnings Call)). Similarly, despite strong North American demand { [REDACTED] } (RX0510 at 0001 (Mei email) *(in camera)*). As Ms. Mei of Tronox told

senior executives, { [REDACTED]
[REDACTED] }

(RX0510 at 0001 (Mei email) (*in camera*)).

565. Indeed, overall, Tronox and Cristal have each increased their capacity over the last 20 years, largely by debottlenecking. (Stern, Tr. 3774).

Response to Proposed Finding No. 565

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence in that Tronox and Cristal have also decreased their capacity on several occasions. (CCFF ¶¶ 586-612). Some of the more notable capacity curtailments occurred in 2012, (CCFF ¶¶ 595-600), in 2013, (CCFF ¶¶ 601-04), and in 2015. (CCFF ¶¶ 605-12). Tronox and its predecessor, Kerr-McGee, also engaged in permanent capacity closures including when the closing of their two Savannah plants in 2004 and 2009. (CCFF ¶¶ 588-90). Kronos also observed that “baseline TiO₂ capacity has been permanently reduced with limited near-term ability to increase capacity.” (PX3011 at 038 (Kronos Presentation)).

b. Tronox Faced Serious Financial Penalties in 2015 as a Result of Its Reduced Output, Diminished Cash Flow, and High Debt.

566. Tronox faced serious financial penalties in 2015 from temporarily idling its TiO₂ production; namely, from its reduced run rate and diminished cash flow. (Arndt, Tr. 1403). Moody’s downgraded Tronox’s credit rating in 2015 because of its reduced cash flow, high inventory, and high debt. (Arndt, Tr. 1403). Specifically, Moody’s downgraded Tronox in the fourth quarter of 2015 with a negative outlook. (Stern, Tr. 3751-52; RX1561). This was “at or near the very trough of the last cyclical downturn.” (Stern, Tr. 3753).

Response to Proposed Finding No. 566

The Proposed Finding is irrelevant and misleading to the extent that fails to explain or demonstrate how Tronox’s credit rating is related to its decisions to withhold output. Furthermore, it ignores the fact that Tronox witnesses and contemporaneous statements confirm that reduced production in 2015 contributed to higher TiO₂ pricing. (CCFF ¶¶ 606-11). The last sentence of

the Proposed Finding is not supported by the evidence cited because the nature of the TiO₂ market cycle is a factual proposition and Mr. Stern lacks the experience necessary to discuss the production or marketing of TiO₂. (Stern, Tr. 3855-59). By Mr. Stern's own admission, he has no experience in running a TiO₂ plant or in marketing TiO₂. (Stern, Tr. 3855-59).

567. If Tronox had not reduced production during this time period, they would have continued building unsold inventory, and tying up working capital that the company did not have. Simply put, if Tronox had continued to produce at its prior rates in 2015, Tronox "likely would have found themselves right back in Chapter 11 [bankruptcy]." (Stern, Tr. 3747; Turgeon, Tr. 2638).

Response to Proposed Finding No. 567

The Proposed Finding is contrary to the weight of the evidence. Tronox's then CFO at the time acknowledged that in 2015 Tronox was [REDACTED] { [REDACTED] } [REDACTED] } (PX7024 (Harper, Dep. at 33-34, 47) (*in camera*); PX1578 at 001 (Arndt email)). Internal Tronox documents support that in 2015 Tronox was in a strong liquidity position. (PX1578 at 001 (Arndt email); PX1579 at 008 (Tronox presentation) (*in camera*)). { [REDACTED] } [REDACTED] } (Romano Tr. at 2208-2211 (*in camera*)). Mr. Romano testified that { [REDACTED] } [REDACTED] } (Romano Tr. at 2211 (*in camera*)).

The Proposed Finding is also misleading and incomplete. The Proposed Finding ignores the fact that instead of curtailing production, North American TiO₂ suppliers could have competed to take market share from each other by selling more output at a lower price. (PX5002 at 006 (¶ 9) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). It also ignores the fact that Tronox withheld output to raise prices. (CCFF ¶¶ 606-10).

568. During the period of 2015-2016, when the market was in the trough and Tronox reduced production, Tronox did not experience increased profitability. (Stern, Tr. 3768). Tronox

instead experienced “losses from operations during four quarters in a row, beginning with the second quarter of 2015 through the first quarter of 2016.” (Stern, Tr. 3768). From 2015-2016, Tronox was reporting losses from operations during four quarters in a row, beginning with the second quarter of 2015 through the first quarter of 2016. (Stern, Tr. 3768).

Response to Proposed Finding No. 568

The Proposed Finding is not supported by the evidence cited. Respondents’ Proposed Finding should be disregarded by the Court because Tronox’s production, profitability, and reported losses are factual propositions that should be established by fact witnesses or documents, not through expert testimony. (Tr. 3254, 3794). The Proposed Finding also ignores the fact that Tronox withheld output to raise prices during that time period. (CCFF ¶¶ 605-12). Tronox’s 2015 output reduction involved production curtailments at Tronox’s Hamilton and Kwinana plants, as well as reduced feedstock production, in order to { [REDACTED] } (PX7007 (Van Niekerk, Dep. at 64) (*in camera*); see also PX7024 (Harper, Dep. at 42) (*in camera*); PX9003 at 011 (Tronox Q1 2016 Earnings Call)). Both Mr. Romano and Mr. Duvekot conceded that { [REDACTED] } [REDACTED] } (PX7001 (Romano, IHT at 167) (*in camera*); PX7026 (Duvekot, Dep. at 148-49) (*in camera*)).

569. In 2015, Tronox had \$875 million in working capital that was frozen in stockpiled inventory. In order to avoid bankruptcy, Tronox launched a three-component program to generate cash. (Turgeon, Tr. 2639).

- a. The first leg of Tronox’s cash generation program was to increase revenue. Tronox accomplished this by attempting to gain market share wherever possible. (Turgeon, Tr. 2640-41).
- b. The second leg of Tronox’s cash generation program was to restructure the company. This restructuring was called “Project Rising Star.” Project Rising Star involved standardizing roles across the company and resulted in a 15% reduction in Tronox’s workforce. (Turgeon, Tr. 2641-42). One of the philosophies behind Project Rising Star was for Tronox to “earn the right to grow.” (Turgeon, Tr. 2642). Tronox’s business philosophy was that in a commodity business, it is essential to establish a low-cost position to better compete against other producers. (Turgeon, Tr. 2642). By lowering its cost structure, Tronox sought to be in a position to better survive the 2015 and future down cycles. (Turgeon, Tr. 2641-43). The rationale is that “in the up cycle,

- if you're the lowest-cost producer, you have the best margin, but in the down cycle, if you're the lowest-cost producer, you can outrun all of your competitor[s]." (Turgeon, Tr. 2642).
- c. The third leg of Tronox's cash-generation program was developing the Tronox Way—a standard of best practices that maximizes output and lowers the company's cost-position at every plant that it operates. (Turgeon, Tr. 2648).

Response to Proposed Finding No. 569

The Proposed Finding is not supported by the evidence cited. While Tronox did launch a program to generate cash at this time, it did not do so to "avoid bankruptcy" as claimed in the Proposed Finding. (Turgeon, Tr. 2638). In 2015, Tronox was [REDACTED] {" [REDACTED] } (PX1578 at 001 (Arndt email); PX1579 at 008 (Tronox presentation) (*in camera*); PX7024 (Harper, Dep. at 33-34, 47) (*in camera*)).

The Proposed Finding is also misleading, incomplete and factually inaccurate concerning Tronox's efforts to gain market share. Mr. Turgeon did testify that in 2015 he did develop a strategy to "grab market share and be as competitive as possible." (Turgeon, Tr. 2640). However, on cross-examination, Mr. Turgeon testified that Tronox was not trying to "grab" market share by reducing price. (Turgeon, Tr. 2681) ("Well, because it's a competitive business, you have to adjust to what your competitor are doing, so you don't want just to lower the price. You lower the price when you're going to lose market share if you don't lower the price. That's just normal business."). In further contrast to this Proposed Finding, when Mr. Turgeon was asked during his deposition whether Tronox had attempted to raise TiO₂ prices in North America during 2015, Mr. Turgeon testified that: {" [REDACTED] [REDACTED] } (PX7019 (Turgeon, Dep. at 66) (*in camera*)).

The Proposed Finding is also contrary to the weight of the evidence. Overall, the ordinary course documents do not support Mr. Turgeon's description of a 2015 Tronox effort to grab share. {" [REDACTED] }

[REDACTED]

[REDACTED] } (PX1124 (Romano email) (*in camera*))

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]). Despite Mr. Turgeon’s testimony about trying to grab share, Tronox’s ordinary course business decisions throughout 2015 were much more consistent [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] (CCFF ¶¶ 605-12).

The Proposed Finding’s references to “Project Rising Star” and “the Tronox Way” are vague, incomplete and irrelevant. These programs are only vaguely defined and are unrelated to Tronox’s 2015 production decisions. Furthermore, Respondents have not shown how these programs affect Tronox’s post-merger production incentives.

570. During the same time period as Project Rising Star, Tronox developed an internal operational excellence program that it called the “Tronox Way.” (Turgeon, Tr. 2643-44). The Tronox Way was developed by creating standards and practices among Tronox employees “who had years of experience at running mines, smelter[s] and pigment plant[s].” (Turgeon, Tr. 2644). The Tronox Way started with a pilot program in the company’s Hamilton, Mississippi plant and was then adapted company-wide. Through implementing the Tronox Way, the company lowered its cost-per-ton of TiO₂ production by \$200. (Turgeon, Tr. 2643-45). This was a “tremendous” success. (Turgeon, Tr. 2645).

Response to Proposed Finding No. 570

The Proposed Finding is irrelevant, incomplete and contrary to the weight of the evidence to the extent it is implying that Tronox used the Tronox Way to increase output. Respondents have

not shown how the Tronox Way affected their production decisions pre-merger nor have they shown how the Tronox way would influence production decisions post-merger. In fact, Tronox withheld output to raise prices during the time period that the Tronox Way was implemented. (CCFF ¶¶ 605-12). Additionally, the Proposed Finding’s use of the term “tremendously successful” is vague.

571. The Tronox Way was the foundation for “how to run a titanium business the most cost-efficient way.” (Turgeon, Tr. 2644). Tronox’s “mantra” became that the company needed to be “the best at mining, the best at smelting, and the best at making pigment.” (Turgeon, Tr. 2642). By “best,” Tronox sought to ensure “safe, quality, low-cost ton for our customer[s].” (Turgeon, Tr. 2642). This series of best practices was “part of that restructuring of the business and developing the standard.” (Turgeon, Tr. 2643).

Response to Proposed Finding No. 571

The Proposed Finding is irrelevant, incomplete and contrary to the weight of the evidence to the extent it is implying that Tronox used the Tronox Way to increase output. Respondents has not shown how the Tronox Way affected their production decisions pre-merger nor have they shown how the Tronox way would influence production decisions post-merger. In fact, Tronox withheld output to raise prices during the time-period that the Tronox Way was implemented. (CCFF ¶¶ 605-12).

B. TiO₂ Plants Are Generally Run Flat-Out; Producers Incur Substantial Costs by Reducing or Shutting Down Production.

572. In the TiO₂ industry, producers “have an incentive to run their plants at high operating rates.” (Stern, Tr. 3712). “[T]his is true of TiO₂ as well as virtually any chemical you can think of.” (Stern, Tr. 3712). This is because the TiO₂ industry is “highly capital-intensive.” (Stern, Tr. 3712). TiO₂ plants “are large, cost a great deal of money to build, and so the harder you run them, the lower your fixed costs per pound of product produced.” (Stern, Tr. 3712).

Response to Proposed Finding No. 572

The Proposed Finding is misleading and incomplete in that it ignores the economic incentives facing firms, as outlined by Dr. Hill. (CCFF ¶¶ 659-60). According to Tronox’s CEO, operating at 80 percent capacity utilization is “not an uncomfortable position for us. Obviously we

would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it.” (PX9033 at 012 (Tronox Q2 2012 Earnings Call)). A larger firm has an incentive to withhold output to capture a higher market price. (Hill, Tr. 1764-67; CCFE ¶ 659). TiO₂ producers have stated numerous times that withholding output of chloride TiO₂ supports higher prices. (CCFE ¶¶ 568-85). Moreover, the respondents have a history of withholding output to support higher North American chloride TiO₂ prices. (CCFE ¶¶ 586-635). Post-merger, the combined firm would have an even stronger incentive to withhold output. (Hill, Tr. 1764-67).

573. Tronox typically runs its plants “all out,” or “flat out,” with the exception of a few occasions when the company was in financial distress. (Quinn, Tr. 2321; Duvekot, Tr. 1342). To run a plant “all out” means “running at full capacity,” i.e., nameplate or above nameplate capacity, “subject obviously to good maintenance practices.” (Quinn, Tr. 2321). In the TiO₂ industry, like the mining industry, “everybody wants to run their mine or their pigment plant at full capacity, because that’s the most economical way to run them.” (Turgeon, Tr. 2636-37).

Response to Proposed Finding No. 573

The Proposed Finding is contrary to the weight of the evidence, which shows that Tronox has chosen to run its plants at lower utilization rates and withheld output to raise price on many occasions. (CCFE ¶¶ 587-612). According to Tronox’s CEO, operating at 80 percent capacity utilization is “not an uncomfortable position for us. Obviously we would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it.” (PX9033 at 012 (Tronox Q2 2012 Earnings Call)). Some of the merging parties’ more notable capacity curtailments occurred in 2012, (CCFE ¶¶ 595-600), in 2013, (CCFE ¶¶ 601-04), and in 2015. (CCFE ¶¶ 605-12). Furthermore, the Proposed Finding fails to recognize that a larger firm has an increased incentive to withhold output to capture a higher market price. (Hill, Tr. 1764-67).

574. The advantage to running TiO₂ plants all-out is that it “reduces your costs.” (Quinn, Tr. 2321). It takes “the same fixed costs and spreads that out over a broader production volume, so you get lower cost.” (Quinn, Tr. 2321). If production rates at TiO₂ plants are reduced, the per-unit cost of TiO₂ “increases significantly.” (Arndt, Tr. 1414). This is because the TiO₂ industry is a “very high fixed cost business.” (Arndt, Tr. 1414).

Response to Proposed Finding No. 574

The Proposed Finding is misleading and incomplete in that it focuses solely on fixed costs, while profit-maximizing firms balance all the costs and benefits of withholding output. (Hill, Tr. 1761). For example, in 2015 Tronox absorbed \$30 million in fixed cost by reducing output but the company found that the benefits from doing so outweighed the costs. (PX9003 at 11 (Tronox Q1 2016 Earnings Call)). According to Tronox’s CEO, operating at 80 percent capacity utilization is “not an uncomfortable position for us. Obviously we would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it.” (PX9033 at 012 (Tronox Q2 2012 Earnings Call)). The merging parties’ have curtailed capacity on numerous occasion including in 2012, (CCFF ¶¶ 595-600), in 2013, (CCFF ¶¶ 601-04), and in 2015, (CCFF ¶¶ 605-12).

575. TiO₂ producers have “an incentive to run their plants at high operating rates” because the industry is “highly capital-intensive[:] Plants are large, cost a great deal of money to build, and so the harder you run them the lower your fixed costs per pound of product produced.” (Stern, Tr. 3712).

Response to Proposed Finding No. 575

The Proposed Finding is not supported by the evidence cited because Mr. Stern lacks the expertise to draw conclusions on economic and industrial organization issues, and lacks TiO₂ experience. (Stern, Tr. 3855-61). The Proposed Finding is also misleading and incomplete in that it focuses solely on fixed costs, while profit-maximizing firms balance all the costs and benefits of withholding output. (Hill, Tr. 1761). According to Tronox’s CEO, operating at 80 percent capacity utilization is “not an uncomfortable position for us. Obviously we would like to be

operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it.” (PX9033 at 012 (Tronox Q2 2012 Earnings Call)). The merging parties have curtailed capacity on numerous occasion including in 2012 (CCFF ¶¶ 595-600), in 2013 (CCFF ¶¶ 601-04), and in 2015. (CCFF ¶¶ 605-12).

576. If Tronox runs its TiO₂ plants at a reduced rate, it incurs fixed cost or absorption penalties, which Tronox bore in 2015. (Arndt, Tr. 1402).

Response to Proposed Finding No. 576

The Proposed Finding is misleading and incomplete. Profit-maximizing firms balance all the costs and benefits of withholding output. (Hill, Tr. 1761). For example, in 2015 Tronox absorbed \$30 million in fixed cost by reducing output but the company found that the benefits from doing so outweighed the costs. (PX9003 at 11 (Tronox Q1 2016 Earnings Call)). According to Tronox’s CEO, operating at 80 percent capacity utilization is “not an uncomfortable position for us. Obviously we would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it.” (PX9033 at 012 (Tronox Q2 2012 Earnings Call)). The merging parties’ have curtailed capacity on numerous occasion including in 2012 (CCFF ¶¶ 595-600), in 2013 (CCFF ¶¶ 601-04), and in 2015. (CCFF ¶¶ 605-12).

577. When production is curtailed at Tronox, it increases the cost of production and reduces margins. (Arndt, Tr. 1414-15). It also results in restricted cash flow due to excess inventory building up feedstock plants and mines in the supply chain. (Arndt, Tr. 1414-15). Because producers must remain cost-competitive and produce as much TiO₂ as possible, even small reductions in sales can have a disproportionate negative impact. (Stern, Tr. 3773).

Response to Proposed Finding No. 577

The Proposed Finding is misleading and incomplete in that it focuses solely on fixed costs, while profit-maximizing firms balance all the costs and benefits of withholding output. (Hill, Tr. 1761). According to Tronox’s CEO, operating at 80 percent capacity utilization is “not an

uncomfortable position for us. Obviously we would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it.” (PX9033 at 012 (Tronox Q2 2012 Earnings Call)). The merging parties’ have curtailed capacity on numerous occasion including in 2012, (CCFF ¶¶ 595-600), in 2013, (CCFF ¶¶ 601-04), and in 2015, (CCFF ¶¶ 605-12). Also, the Proposed Finding is not supported by the evidence cited because Mr. Stern lacks the expertise to draw conclusions on economic and industrial organization issues. (Stern, Tr. 3855-61).

578. It is not easy to restart a TiO₂ plant after an outage. It is not “as easy as flipping a switch.” (Stern, Tr. 3751). In order to restart a plant after an outage, plants must reach certain conditions of temperature; the plant must also meet certain conditions of material flow. If an obstruction has formed, they require someone to come in with a jackhammer to clear the obstruction out of the way. (Stern, Tr. 3751).

Response to Proposed Finding No. 578

The Proposed Finding is not supported by the evidence cited because Mr. Stern lacks the personal knowledge or expertise to discuss the process of restarting a TiO₂ plant. (Stern, Tr. 3855-59). Furthermore, the process of restarting a TiO₂ plant is a factual issue that should be address by the testimony of fact witnesses and documentary evidence rather than by an expert witness. (Tr. 3254, 3794). The Proposed Finding is also irrelevant and misleading because profit-maximizing firms balance all the costs and benefits of withholding output. (Hill, Tr. 1761).

579. Restarting a production line at a pigment plant is very expensive. (Turgeon, Tr. 2651-52). Once a production line has been idled, the corrosive environment of the plant requires significant maintenance and capital costs that can include relining a chlorinator. (Turgeon, Tr. 2651-52).

Response to Proposed Finding No. 579

The Proposed Finding is misleading, since profit-maximizing firms balance all the costs and benefits of withholding output. (Hill, Tr. 1761). For example, in 2015 Tronox absorbed \$30 million in fixed cost by reducing output but the company found that the benefits from doing so

outweighed the costs. (PX9003 at 11 (Tronox Q1 2016 Earnings Call)). According to Tronox's CEO, operating at 80 percent capacity utilization is "not an uncomfortable position for us. Obviously we would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it." (PX9033 at 012 (Tronox Q2 2012 Earnings Call)). The merging parties' have curtailed capacity on numerous occasion including in 2012, (CCFF ¶¶ 595-600), in 2013, (CCFF ¶¶ 601-04), and in 2015, (CCFF ¶¶ 605-12).

580. Indeed, other TiO₂ producers agree that TiO₂ plants "have high fixed costs." (Christian, Tr. 864). The TiO₂ industry is a high fixed cost industry, and "[a]ny business that operates with fixed and variable costs, when you reduce your volume, your fixed costs per unit of measure are going to increase, and that has an impact on financials." (Christian, Tr. 881).

Response to Proposed Finding No. 580

The Proposed Finding is incomplete and misleading. Profit-maximizing firms balance all the costs and benefits of withholding output, including fixed costs. (Hill, Tr. 1761). For example, in 2015 Tronox absorbed \$30 million in fixed cost by reducing output but the company found that the benefits from doing so outweighed the costs. (PX9003 at 11 (Tronox Q1 2016 Earnings Call)). According to Tronox's CEO, operating at 80 percent capacity utilization is "not an uncomfortable position for us. Obviously we would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it." (PX9033 at 012 (Tronox Q2 2012 Earnings Call)). The merging parties' have curtailed capacity on numerous occasion including in 2012, (CCFF ¶¶ 595-600), in 2013, (CCFF ¶¶ 601-04), and in 2015, (CCFF ¶¶ 605-12).

Furthermore, though Kronos acknowledged the fixed costs associated with this industry, it also recognizes that "[h]igher concentration increases likelihood of continued capacity constraints"

and higher prices. (PX 3011 at 038 (Kronos Presentation); Cristian, Tr. 772; *see also* PX3000 at 004 (Venator presentation) (*in camera*)).

581. As a result, there are “[a]bsolutely” “costs involved in curtailing capacity” at its TiO₂ plants, including “opportunity costs” and “dislocation involving technology, workers and facilities.” (Christian, Tr. 864-65).

Response to Proposed Finding No. 581

The Proposed Finding is incomplete and misleading. Profit-maximizing firms balance all the costs and benefits of withholding output, including fixed costs. (Hill, Tr. 1761). For example, in 2015 Tronox absorbed \$30 million in fixed cost by reducing output but the company found that the benefits from doing so outweighed the costs. (PX9003 at 11 (Tronox Q1 2016 Earnings Call)). According to Tronox’s CEO, operating at 80 percent capacity utilization is “not an uncomfortable position for us. Obviously we would like to be operating in the high 90s but we have reconfigured some of our activities and think we can do it profitably without a lot of fixed costs overhang associated with it.” (PX9033 at 012 (Tronox Q2 2012 Earnings Call)). The merging parties have curtailed capacity on numerous occasion including in 2012 (CCFF ¶¶ 595-600), in 2013 (CCFF ¶¶ 601-04), and in 2015. (CCFF ¶¶ 605-12).

Furthermore, though Kronos acknowledged the fixed costs associated with this industry, it also recognizes that “[h]igher concentration increases likelihood of continued capacity constraints” and higher prices. (PX 3011 at 038 (Kronos Presentation); Cristian, Tr. 772; *see also* PX3000 at 004 (Venator presentation) (*in camera*)).

582. There are also there are “significant costs in starting [TiO₂ facilities] back up again” after being shut down. (Christian, Tr. 865). Kronos agreed that “there are significant problems with stopping production and restarting production” at chloride TiO₂ plants. (Christian, Tr. 869).

Response to Proposed Finding No. 582

The Proposed Finding is incomplete and misleading. Mr. Christian of Kronos testified that chloride TiO₂ producers can turn their plants on and off with ease, though there are costs associated with doing so. (Christian, Tr. 865). Mr. Dean of Tronox testified that Tronox can bring the entire Hamilton plant back online after a closure within { [REDACTED] }. (PX7023 (Dean Dep. at 141-143) (*in camera*)). Profit-maximizing firms balance all the costs and benefits of withholding output. (Hill, Tr. 1761).

Tronox has curtailed output on a number of occasions despite the associated costs in doing so. (CCFF ¶¶ 586-612). Mr. Casey emphasized in a 2017 public earnings call that “[Tronox] ha[s] tried to be economically rational over these last several years. If there was surplus supply in the market, we slowed down our production, and we did that with respect to pigment.” (PX9000 at 012 (Tronox Q4 2016 Earnings Call)). Mr. Casey also publicly assured investors that Tronox would “still balance our supply with demand” after the acquisition. (PX9000 at 012 (Tronox Q4 2016 Earnings Call)). Tronox reaffirmed its strategy of output curtailment in a 2017 strategic document, saying { [REDACTED] } [REDACTED] } (PX1333 at 010 (Tronox presentation) (*in camera*)).

583. According to Kronos, it is “not a wise strategy to curtail” production at TiO₂ facilities because “there’s significant cost to doing that.” (Christian, Tr. 865-66).

Response to Proposed Finding No. 583

The Proposed Finding is incomplete and misleading. Mr. Christian testified that “[TiO₂ producers] can reduce production by curtailing capacity if [they] wanted to make that strategic decision.” (Christian, Tr. 864). Profit-maximizing firms balance all the costs and benefits of withholding output. (Hill, Tr. 1761). Kronos, like other TiO₂ producers, has curtailed output in the past. (Christian, Tr. 866). Likewise, Tronox has curtailed output on a number of occasions despite

the associated costs in doing so. (CCFF ¶¶ 586-612). Tronox curtailed output because it found that the benefits of doing so outweigh the costs. (PX9003 at 011 (Tronox Q1 2016 Earnings Call)).

584. “[T]here are good economic reasons to run plants flat-out.” (Christian, Tr. 864). For this reason, Kronos “runs its plants flat-out.” (Christian, Tr. 864). Kronos agreed that “a well-run titanium dioxide plant is one that runs at full capacity” (Christian, Tr. 862), and “a well-run plant is going to produce as much product as possible.” (Christian, Tr. 863). In the TiO₂ industry, “[i]f there’s a market to sell the product, you want to run full-out and sell everything that you make.” (Christian, Tr. 866).

Response to Proposed Finding No. 584:

The second sentence of the Proposed Finding is misleading and incomplete because it excludes Mr. Christian’s testimony that Kronos has not run “full-out” through all cycles. (Christian, Tr. 866). Overall, the Proposed Finding is incomplete and misleading. Profit-maximizing firms balance all the costs and benefits of withholding output. (Hill, Tr. 1761). Kronos, like other TiO₂ producers, has curtailed output in the past. (Christian, Tr. 866). Likewise, Tronox has curtailed output on a number of occasions despite the associated costs in doing so. (CCFF ¶¶ 586-612). Tronox curtailed output because it found that the benefits of doing so outweigh the costs. (PX9003 at 011 (Tronox Q1 2016 Earnings Call)).

585. Moreover, TiO₂ plants cannot simply be “dialed back.” (Christian, Tr. 866-67). “[T]here’s no dial that can just dial back production” at Kronos’ TiO₂ facilities. (Christian, Tr. 864). And Kronos is “not aware of” any other major TiO₂ producer that has “more of a dial for adjusting its production” than Kronos. (Christian, Tr. 866-67).

Response to Proposed Finding No. 585

Overall, the Proposed Finding is misleading, incomplete, and contrary to the weight of the evidence. In addition to the testimony of Mr. Christian below that dispute the Proposed Finding, the weight of the evidence shows that both Tronox and Cristal have withheld chloride TiO₂ production in North America. (CCFF ¶¶ 586-612, 619-30). Some of Tronox’s more notable capacity curtailments occurred in 2012 (CCFF ¶¶ 595-600), in 2013 (CCFF ¶¶ 601-04), and in

2015. (CCFF ¶¶ 605-12). Likewise, according to Dr. Hill’s economic analysis of Cristal’s plant-level production data, Cristal’s capacity utilization at its Ashtabula I plant was { [REDACTED] [REDACTED] [REDACTED] }. (PX5002 at 008 (Fig. 2) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)).

The second sentence of the Proposed Finding is misleading, incomplete, and is contrary to the weight of the evidence. When asked “You’d agree with me there's no dial that can just dial back production at Kronos’ facilities; correct?” Mr. Christian responded “Correct. But I would say that you can reduce production by curtailing capacity if you wanted to make that strategic decision.” (Christian, Tr. 864). Mr. Christian further testified that Kronos has curtailed output in the past. (Christian, Tr. 866).

The third sentence of the Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Kronos testified that Chemours has proprietary technology that allows Chemours to manipulate production in ways that Kronos cannot. (Christian, Tr. 868). Mr. Christian agreed that this could be considered a “quasi dial.” (Christian, Tr. 868).

586. Further, it is more difficult to reduce TiO₂ production at chloride-process facilities than sulfate-process facilities. (Christian, Tr. 868). Kronos agreed that “[i]t’s even harder to manage output by adjusting your production levels at a chloride facility than a sulfate facility.” (Christian, Tr. 868). During weak cycles, Kronos has “seen more curtailment coming out of sulfate plants” than chloride plants. (Christian, Tr. 869-70).

Response to Proposed Finding No. 586

The Proposed Finding is irrelevant and misleading. The relevant product market is the sale of chloride TiO₂ to North American customers. (CCFF ¶¶ 26-329). The record contains ample evidence that Cristal and Tronox have both restricted output of chloride TiO₂ in the past to

influence price. (CCFF ¶¶ 587-612, 619-30). When Tronox curtailed output of chloride TiO₂, it did so because it found that the benefits of curtailing output outweighed the costs. (PX9003 at 011 (Tronox Q1 2016 Earnings Call); Hill, Tr. 1761).

587. “In this current environment,” the big western TiO₂ producers “are running chloride process plants at 100 percent of practical capacity right now.” (Christian, Tr. 871). The last down cycle when Kronos did not run its plants full-out was in the “2008-2009 time frame,” i.e. “roughly ten years ago.” At this time, “there were titanium dioxide manufacturers declaring for bankruptcy.” (Christian, Tr. 866).

Response to Proposed Finding No. 587

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. While Kronos may have last withheld output in 2008-2009 (Christian, Tr. 866), there are a number of occasions when both Tronox and Cristal have withheld output since then. (CCFF ¶¶ 587-612, 619-30). Moreover, the quoted text in the final sentence is not Christian’s testimony, but a quote from the question asked by Respondent’s counsel. (Christian, Tr. 960 (“Q. Earlier you also mentioned that there are --there were -- in 2008 to 2009, there were major TiO₂ manufacturers declaring bankruptcy. Do you remember that? A. I remember it being said, but it was being said -- I apologize. I don’t recall your name – but by counsel. I didn’t say that they were in bankruptcy.”)) Mr. Christian only identified one TiO₂ manufacturer who declared bankruptcy in 2009, which was Kerr-McGee/Tronox. (Christian, Tr. 960). Tronox declared bankruptcy in 2009 because of the billions of dollars in environmental liability that Kerr-McGee had included in the Tronox spinoff { [REDACTED] } (Romano, Tr. 2208-09 (*in camera*); Cristian Tr. at 961).

588. Kronos could not identify a single TiO₂ producer, including Kronos, that—at any time—“cut production at a plant solely for purposes of trying to increase price.” (Christian, Tr. 873).

Response to Proposed Finding No. 588

The Proposed Finding is incomplete, misleading, contrary to the weight of the evidence and vague as to the word “solely.” Mr. Christian testified: “I can identify instances where our competitors curtailed production due to supply-demand economics, but I don’t know if it was solely based upon price.” (Christian, Tr. 873). There are a number of instances in the past where the parties have restricted output to influence price. (CCFF ¶¶ 587-612, 619-30). Complaint Counsel has identified in their Supplemental Response to Cristal Contention Interrogatories at least ten instances in which TiO₂ producers have restricted output. (Complaint Counsel’s Supplemental Responses and Objections to Respondent Cristal’s Contention Interrogatories (1, 8) at 002-03). Additionally, Dr. Hill identified numerous instances when TiO₂ producers have curtailed production of TiO₂ to increase prices. (PX5000 at 079-85 (¶¶ 185-88 & Figs. 30-32) (Hill Initial Report) (*in camera*)).

589. Indeed, even after extensive discovery in this matter, Complaint Counsel still could not identify a *single* example where *any* TiO₂ producer adjusted output “for the purpose of supporting higher prices rather than maintenance or operational issues.” (FTC Response to Cristal Interrogatory No. 1).

Response to Proposed Finding No. 589

The Proposed Finding is factually inaccurate, misleading, incomplete and contrary to the weight of the evidence. Complaint Counsel has identified in their Supplemental Response to Contention Interrogatories at least ten instances in which TiO₂ producers have restricted output. (Complaint Counsel’s Supplemental Responses and Objections to Respondent Cristal’s Contention Interrogatories (1, 8) at 002-03). Indeed, the record is replete with evidence demonstrating the North American TiO₂ producers have reduced output, which effected the price of chloride TiO₂ in North America. (CCFF ¶¶ 587-612, 619-30).

590. It is unlikely that the combined Tronox Cristal entity would reduce output at Hamilton or Ashtabula because they are the lowest cost posture plants for both Tronox and Cristal. (Stern, Tr. 3853). There is no “business logic” that would underlie reducing production at the

Ashtabula and Hamilton plants, particularly at the present time in an industry upswing and given their posture as the lowest cost plants for the companies. (Stern, Tr. 3853).

Response to Proposed Finding No. 590

The Proposed Finding is not supported by the evidence cited because Mr. Stern lacks the expertise to draw conclusions on economic and industrial organization issues. (Stern, Tr. 3855-61). By Mr. Stern's own admission, he has no experience in running a TiO₂ plant or in marketing TiO₂. (Stern, Tr. 3855-59). Furthermore, Tronox and Cristal's cost position is a fact issue that should not be established by an expert witness. (Tr. 3254, 3794).

The Proposed Finding is also factually inaccurate and contrary to the weight of the evidence. Dr. Hill's capacity closure model accounts for the cost parameters of each plant and measures the costs and benefits of output withholding. (CCFF ¶¶ 664-65). That model showed that the merged firm would have an incentive to withhold output. (CCFF ¶ 660). Moreover, the weight of the quantitative and qualitative evidence in this case support the conclusion that post-merger, Tronox would have an increased incentive to withhold output. (CCFF ¶¶ 551-694).

591. Today, Tronox is "making every ounce [of TiO₂] we can, selling every ounce we make." (Arndt, Tr. 1422). Indeed, Tronox "wish[es] we had more product." (Arndt, Tr. 1422).

Response to Proposed Finding No. 591

The Proposed Finding is not supported by the evidence cited. As Tronox's vice president of investor relations, Mr. Arndt is "not involved in the operations side of Tronox' functions" and is not qualified to discuss Tronox's production decisions. (Arndt, Tr. 1353, 1424). The Proposed Finding is also vague as to the relevant time period being discussed.

The Proposed Finding is misleading. Dr. Hill's capacity closure model measures incentive to withhold output of the merged firm relative compared to the stand-alone firms. (CCFF ¶ 660). The capacity closure model predicts that the transaction is likely to have an anticompetitive effect

in the North American chloride TiO₂ market by increasing the incentives of the merged firm relative to each of the stand-alone firms to reduce output today. (Hill, Tr. 1858). Moreover, the weight of the quantitative and qualitative evidence in this support the conclusion that post-merger, Tronox would have an increased incentive to withhold output. (CCFF ¶¶ 551-694).

The Proposed Finding is also incomplete because it does not mention that Tronox frequently operates its plants below full capacity. (CCFF ¶¶ 586-612). Some of the more notable capacity curtailments occurred in 2012, (CCFF ¶¶ 595-600), in 2013, (CCFF ¶¶ 601-04), and in 2015, (CCFF ¶¶ 605-12). Tronox and its predecessor, Kerr-McGee, also engaged in permanent capacity closures including when the closing of their two Savannah plants in 2004 and 2009. (CCFF ¶¶ 588-90).

C. The FTC's Theory of Withholding Output Fails to Reflect a Realistic or Accurate Portrayal of the Commercial Dynamics of the TiO₂ Industry.

592. The FTC's theory of withholding output and the "conclusions [Dr. Hill] reaches [regarding withholding output] don't comport with the way the real world works in the chemical industry." (Stern, Tr. 3854).

Response to Proposed Finding No. 592

The Proposed Finding is vague, misleading, incomplete and contrary to the weight of the evidence, which demonstrates that significant output withholding does in fact occur in the North American chloride TiO₂ market. (CCFF ¶¶ 587-612, 619-30). Additionally, the Proposed Finding relies solely on Respondents' expert who is inappropriately testifying about facts and who has very little, if any, experience or expertise in the TiO₂ market. (Stern, Tr. 3855-59; Order on Post-Trial Briefs at 3). Mr. Stern has never been employed or retained as a consultant by a TiO₂ customer or supplier; has never been involved in TiO₂ supply negotiations; has no experience in TiO₂ distribution, the manufacturing process; and has never been to a TiO₂ manufacturing facility. (Stern, Tr. 3855-59).

593. For example, Dr. Hill fails to acknowledge the status of the TiO₂ price cycle when he criticizes TiO₂ producers for controlling output during economic downturns. (Stern, Tr. 3748). Dr. Hill cites excerpts from Cristal and Tronox documents to support his opinions regarding output reductions in the industry; these interpretations do not consider the context of the industry cycle, “which is well-proven, goes back decades, and is a significant driver of company strategy in the chemical industry generally, and the TiO₂ business in particular.” (Stern, Tr. 3757-58).

Response to Proposed Finding No. 593

The Proposed Finding is vague, misleading, inaccurate and contrary to the weight of the record evidence. (PX5002 at 005-06 (¶¶ 5-7) (Hill Rebuttal Report to Stern and Imburgia); CCFF ¶¶ 658-70 (showing that the merged firm has a greater incentive to withhold output, which is true at every point in the TiO₂ price cycle)). Whether there is a TiO₂ price cycle is irrelevant to the analysis of the merger’s likely effect on the incentive of the TiO₂ producers. (PX5002 at 005-06 (¶¶ 5-7) (Hill Rebuttal Report to Stern and Imburgia); CCFF ¶¶ 658-70 (showing that the merged firm has a greater incentive to withhold output, which is true at every point in the TiO₂ price cycle)). The increased incentive post-merger to withhold supply would apply to all points in the price cycle. (PX5002 at 005 (¶5) (Hill Rebuttal Report to Stern and Imburgia); CCFF ¶¶ 658-70 (showing that the merged firm has a greater incentive to withhold output, which is true at every point in the TiO₂ price cycle)). Additionally, the Proposed Finding relies on Respondents’ expert who is inappropriately testifying about facts and who has very little, if any, experience or expertise in the TiO₂ market. (Stern, Tr. 3855-3859; Order on Post-Trial Briefs at 3). Mr. Stern has never been employed or retained as a consultant by a TiO₂ customer or supplier; has never been involved in TiO₂ supply negotiations; has no experience in TiO₂ distribution, the manufacturing process; and has never been to a TiO₂ manufacturing facility. (Stern, Tr. 3855-3859).

594. 

Response to Proposed Finding No. 594

The Proposed Finding is misleading, incomplete, misrepresents Dr. Hill's expert reports and testimony, and is contrary to the weight of the record evidence. Dr. Hill does not consider the closure at Edge Moor in isolation. (PX5000 at 030 (¶ 70); 078-79 (¶ 183); 111-12 (¶ 256-57 & Fig. 38) (Hill Initial Report) (*in camera*)). In fact, Dr. Hill's April 18, 2018 expert report references the capacity changes at Edge Moor and Altamira together in multiple locations. (PX5000 at 030 (¶ 70); 078-79 (¶ 183); 111-12 (¶ 256-57 & Fig. 38) (Hill Initial Report) (*in camera*)). Similarly, Mr. Christian of Kronos testified that Altamira's expansion was net neutral to industry supply due to the closure of Edge Moor and line closure at another Chemours plant in the United States. (Christian, Tr. 876-77). Moreover, Altamira sells very little TiO₂ into the United States and Canada, and what it does sell there is captured in Dr. Hill's market shares that include all sales of chloride TiO₂ to North American (US and Canada) customers. (PX5000 at 144-45 (¶¶ 323-25) (Hill Initial Report) (*in camera*); RX0170 at Figure 2).

595. Dr. Hill cites to the fact that a number of TiO₂ plants closed as evidence that TiO₂ producers closed plants to drive up price. However, these plants were closed primarily due to weak TiO₂ markets. There were also situations where some of the plants Dr. Hill cited were either too small to be cost-competitive, or they were producing a product no longer needed by the market. (Stern, Tr. 3771; 3773). The period of 2012-2016, when Tronox's and Cristal's prices were steadily declining, is the same period of time that Dr. Hill asserts TiO₂ producers were reducing output to drive up price. (Stern, Tr. 3770).

Response to Proposed Finding No. 595

The Proposed Finding is misleading, incomplete and contrary to the weight of the record evidence. TiO₂ output in North America has been withheld in a variety of market conditions, including when margins at the plant were high. (PX5002 at 006-08 (¶¶ 8-10 & Figs. 1-3) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*); CCF 595-604)). The parties could have competed by lowering price to steal share from their competitors and still earned high variable

margins, but they instead chose to lower output. (PX5002 at 007 (¶ 10) (Hill Rebuttal Report to Stern and Imburgia); CCF ¶¶ 438, 624)). The Cristal and Tronox documents show that producers have withheld output in order to raise prices. (PX5002 at 008-10 (¶¶ 8-10 & Figs. 1-3) (Hill Rebuttal Report to Stern and Imburgia); CCF ¶¶ 595-604)). For example, in 2016, Mr. Duvekot of Tronox wrote { [REDACTED] } (PX1435 at 001 (Duvekot email) (*in camera*)).

Moreover, the Proposed Finding is overly broad and too simplistic in its allegation that the prices were steadily declining during this period. There is no evidence in the record that prices were declining for all grades, regions and customers. This statement does not take into account months during this time period where the average price rose relative to the previous month, and if the TiO₂ producers had not cut their production, prices likely would have fallen at a faster rate. (*See, e.g.*, PX1015 at 001 (Romano email to Casey and Greenwell) ({ [REDACTED] } (in camera)).

596. The FTC's theory also ignores the key role of demand dynamics in the TiO₂ industry, and on any impact of changes in supply on TiO₂ market prices. (Stern, Tr. 3710). For instance, Dr. Hill admitted that he did not analyze "changes in the level of TiO₂ demand from year to year in his report." Dr. Hill also did not analyze "the causes of" changes in TiO₂ demand from year to year. (Stern, Tr. 3710).⁶⁷

Response to Proposed Finding No. 596

The Proposed Finding is misleading, incomplete, lacks citation support and is contrary to the weight of the record evidence. One of the key results of Dr. Hill's analysis on competitive

⁶⁷ By "assuming that demand remains steady" and ignoring the demand side of the equation, Chief Judge Chappell likewise observed that the FTC "seem[ed] to be posing somewhat of a hypothetical with missing information" (Judge Chappell, Tr. 1378-79).

effects is how changes in supply impact market prices. (PX5000 at 087 (¶ 199) (*in camera*)). Further, Dr. Hill studied a number of factors that influence demand for TiO₂, including GDP, housing starts, and construction spending. (PX5000 at 138 (¶ 304) (Hill Initial Report) (*in camera*)).

597. The FTC's theory fails to appreciate that TiO₂ prices were dropping from 1995 until 2009-2010. (Stern, Tr. 3738-39; RX0171.0070). [REDACTED]

Response to Proposed Finding No. 597

The Proposed Finding is misleading, incomplete, and contrary to the weight of the evidence. Whether there is a TiO₂ price cycle is irrelevant to the analysis of the merger's likely effect on the incentives of the TiO₂ producers. (PX5002 at 005-06 (¶¶ 5-7) (Hill Rebuttal Report to Stern and Imburgia); CCF ¶¶ 658-70 (showing that the merged firm has a greater incentive to withhold output, which is true at every point in the TiO₂ price cycle)). The increased incentive

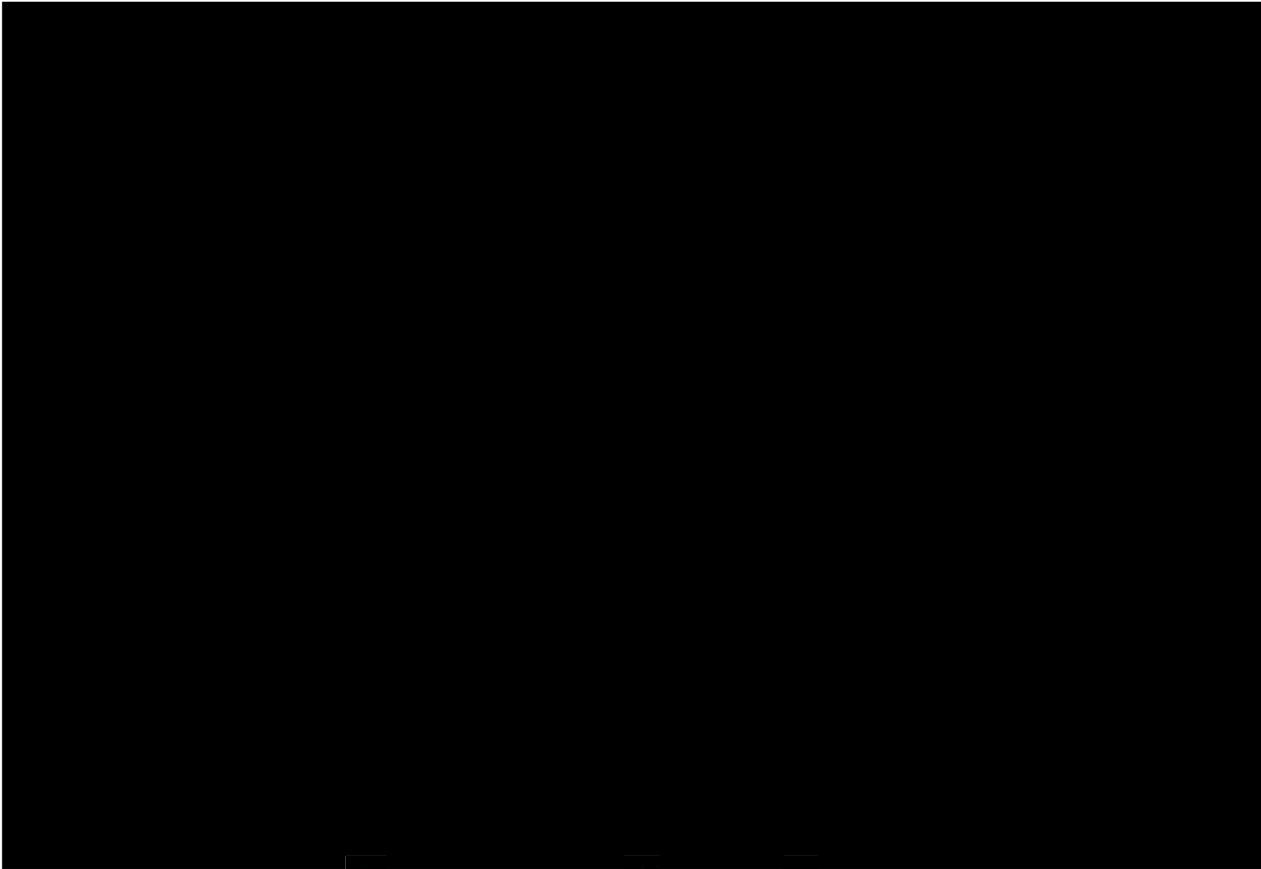
post-merger to withhold supply would apply to all points in the price cycle: “it would be present when the market is tight and withholding output would likely increase the market price, and it would be present when the market is not tight and withholding output would likely slow the speed at which the market price falls, hasten its recovery, or both.” (PX5002 at 005 (¶ 5) (Hill Rebuttal Report to Stern and Imburgia); CCFF ¶¶ 658-70 (showing that the merged firm has a greater incentive to withhold output, which is true at every point in the TiO₂ price cycle)).

598. Stern Figure 25 (RX0171.0070) shows “the cyclical behavior of the business.” (Stern, Tr. 3737). As reflected in Stern Figure 25 (RX0171.0070), the TiO₂ industry “hit a pricing and profitability peak” during the late 1980s. (RX0171.0069). The “peak shown in the TiO₂ business [in 1988-89] occurred at the same time as a peak in the chemical industry” more broadly. (Stern, Tr. 3737). The next peak in the chemical industry occurred in 1995, and the following peak occurred in 2005. (Stern, Tr. 3737-38). Then, there was “a rise in 2011-2012, and that is the result of the feedstock shortage period . . . that resulted in a significant price increase.” (Stern, Tr. 3738). From the period 1995 to 2009, TiO₂ prices were largely dropping. (Stern, Tr. 3738-39). They didn’t recover and “mov[e] upward” until “following the Great Recession of 2008-2009.” (Stern, Tr. 3739).

Response to Proposed Finding No. 598


The Proposed Finding is misleading, incomplete, and contrary to the weight of the evidence. Whether there is a TiO₂ price cycle is irrelevant to the analysis of the merger’s likely effect on the incentives of the TiO₂ producers. (PX5002 at 005-06 (¶¶ 5-7) (Hill Rebuttal Report to Stern and Imburgia); CCFF ¶¶ 658-70 (showing that the merged firm has a greater incentive to withhold output, which is true at every point in the TiO₂ price cycle)). The increased incentive post-merger to withhold supply would apply to all points in the price cycle: “it would be present when the market is tight and withholding output would likely increase the market price, and it would be present when the market is not tight and withholding output would likely slow the speed at which the market price falls, hasten its recovery, or both.” (PX5002 at 005 (¶ 5) (Hill Rebuttal Report to Stern and Imburgia); CCFF ¶¶ 658-70 (showing that the merged firm has a greater incentive to withhold output, which is true at every point in the TiO₂ price cycle)).

599. Stern Figure 27 (RX0171.0074) illustrates pricing for feedstock between 2005 and 2017, and shows the feedstock pricing reflecting feedstock shortages, culminating a peak in feedstock pricing in the early part of 2012. (Stern, Tr. 3744).




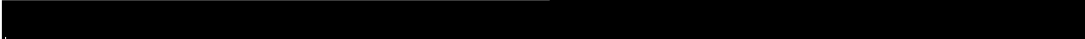
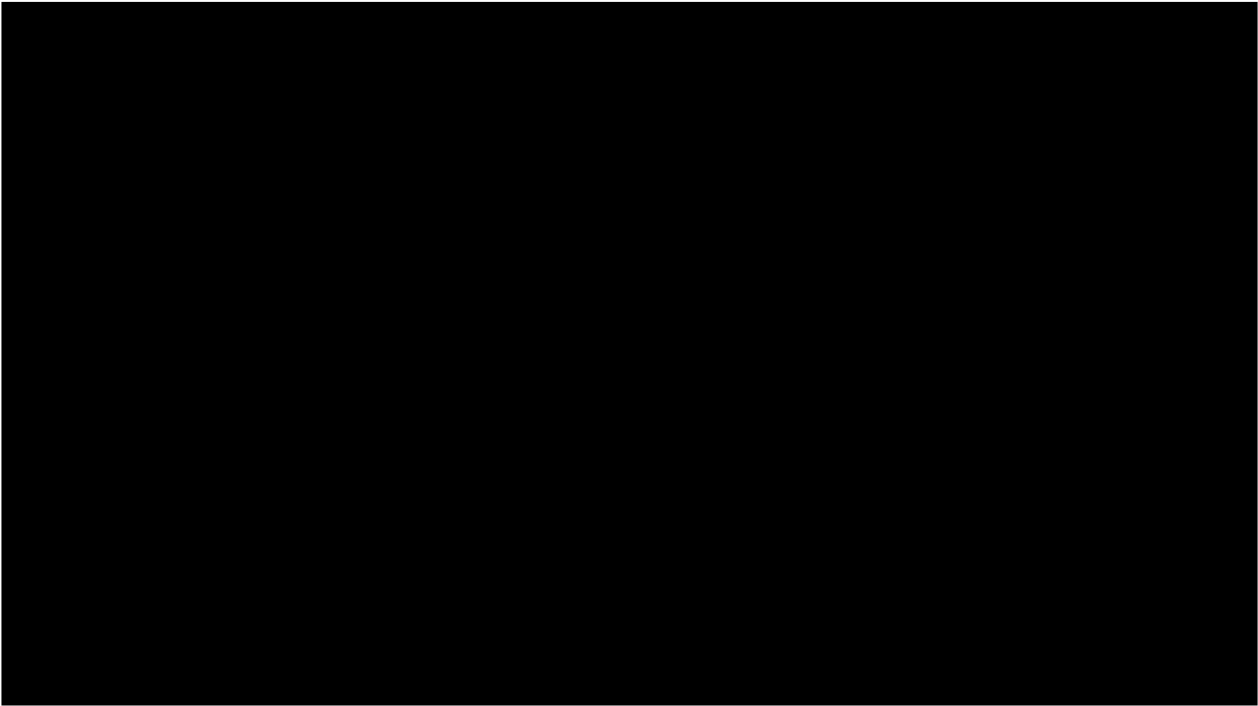
Response to Proposed Finding No. 599

The Proposed Finding is misleading, incomplete, inaccurate and contrary to the weight of the evidence. While the figure shows a peak in feedstock pricing in 2012 for most feedstock types, there is no evidence, and the Respondents have not cited any, to support the notion that this price increase was driven by a shortage. Mr. Stern’s own report shows that feedstock price and TiO₂ margins were near a peak at the same time – if feedstock prices were really driving TiO₂ prices, TiO₂ margins should have shrunk or at least not grown, but producers were able to exercise great market power and continue to apply higher markups even with higher costs. (RX0171 at 052).

600. Stern Figure 27 (RX0171.0074) shows “very rapid rises in feedstock pricing, culminating in a peak in the early part of 2012.” (Stern, Tr. 3744). 


Response to Proposed Finding No. 600

The Proposed Finding is misleading, incomplete, inaccurate and contrary to the weight of the evidence. While the figure shows a peak in feedstock pricing in 2012 for most feedstock types, there is no evidence, and the Respondents have not cited any, to support the notion that this price increase was driven by a shortage. Mr. Stern's own report shows that feedstock price and TiO₂ margins were near a peak at the same time – if feedstock prices were really driving TiO₂ prices, TiO₂ margins should have shrunk or at least not grown, but producers were able to exercise great market power and continue to apply higher markups even with higher costs. (RX0171 at 052).

601. The FTC's theory also ignores that *prices* and *margins* do not move in tandem in the TiO₂ industry. (Stern, Tr. 3729-30). 



Response to Proposed Finding No. 601

The Proposed Finding is misleading, irrelevant, and contrary to the weight of the evidence. Dr. Hill considered margins in the context of his economic analysis, and, in fact, much of his analysis “is based on producer margins.” (PX5002 at 012 (¶ 17) (Hill Rebuttal Report to Stern and Imburgia)). Moreover, the chart in the Proposed Finding shows that margins and prices are definitely correlated. (RX0171 at 055).

602. Stern Figure 18 shows that margins dropped more rapidly than price in the 2012-2013 and also the 2015-2016 time periods. (Stern, Tr. 3730-31; RX0171.0055). Margins were dropping more rapidly than price between 2012-2013 and between 2015-2016 because there was a significant cyclical downturn during the period of 2012-2016, lasting about four years. (Stern, Tr. 3731; RX0171.0055).

Response to Proposed Finding No. 602

The Proposed Finding is misleading, incomplete, and contrary to the weight of the evidence. Whether there is a TiO₂ price cycle is irrelevant to the analysis of the merger’s likely effect on the incentives of the TiO₂ producers. (PX5002 at 005-06 (¶¶ 5-7) (Hill Rebuttal Report to Stern and Imburgia); CCF ¶¶ 658-70 (showing that the merged firm has a greater incentive to withhold output, which is true at every point in the TiO₂ price cycle)). The increased incentive post-merger to withhold supply would apply to all points in the price cycle: “it would be present when the market is tight and withholding output would likely increase the market price, and it would be present when the market is not tight and withholding output would likely slow the speed at which the market price falls, hasten its recovery, or both.” (PX5002 at 05 (¶ 5) (Hill Rebuttal Report to Stern and Imburgia); CCF ¶¶ 658-70 (showing that the merged firm has a greater incentive to withhold output, which is true at every point in the TiO₂ price cycle)).

603. Although “[a] lot of capacity” was “taken offline” during the 1995 to 2010 time frame “as a result of poor financial performance of the industry,” these closures were prompted by “downturns either in the general economy or specifically in the TiO₂ industry.” (Christian, Tr. 766).

Response to Proposed Finding No. 603

The Proposed Finding is misleading, incomplete, and contrary to the weight of the evidence in that it insinuates that chloride TiO₂ plants were taken offline solely due to poor financial performance in the industry. However, ordinary course business documents during this time say otherwise. (PX2083 at 001 (Stoll/Najjar email chain) (“the pricing momentum began when significant major capacity was taken off line in 2008 and 2009 during the financial crisis.”); PX1109 at 011 (Tronox presentation) ([REDACTED] [REDACTED] [REDACTED])) (*in camera*). Moreover, the TiO₂ producers have withheld output in the more recent past at least in part to increase price. (CCFF ¶¶ 587-92, 620-22).

Additionally, the Proposed Finding is misleading and incomplete in that Respondents neglected to include the rest of the testimony from Mr. Christian on this subject, where he specifically testifies that “[a] majority of those [plants taken offline] come from the SP [sulfate] process. So a lot of the western SP plants have been closed during that ’95 to 2010 time frame.” (Christian, Tr. 766).

604. Furthermore, Dr. Hill does not take into account “costs and the influences of costs on the price of TiO₂ in his analysis.” (Stern, Tr. 3723). But manufacturing costs are a significant determinant of price levels; manufacturing costs are the largest, with the small addition of selling, general, and administrative costs (SG&A), research and development costs (R&D), and freight costs. (Stern, Tr. 3721-22.) Total manufacturing cost is comprised of feedstock costs, chemical costs, fixed costs, waste (for environmental management purposes), and utilities. (Stern, Tr. 3723; RX0171.0054).

Response to Proposed Finding No. 604

The Proposed Finding is misleading, incomplete and contrary to the weight of the record evidence, as Dr. Hill does in fact consider manufacturing costs in his analysis. (PX5002 at 012 (¶ 17) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). For example, Dr. Hill specifically explains using Mr. Stern’s own Figure 16, that [REDACTED]

[REDACTED]

[REDACTED] } (PX5002 at 011 (¶ 15 & Fig. 16) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). This clearly shows that the price increases were not due to the need pass through manufacturing costs. (PX5002 at 011 (¶ 15) (Hill Rebuttal Report to Stern and Imburgia)).

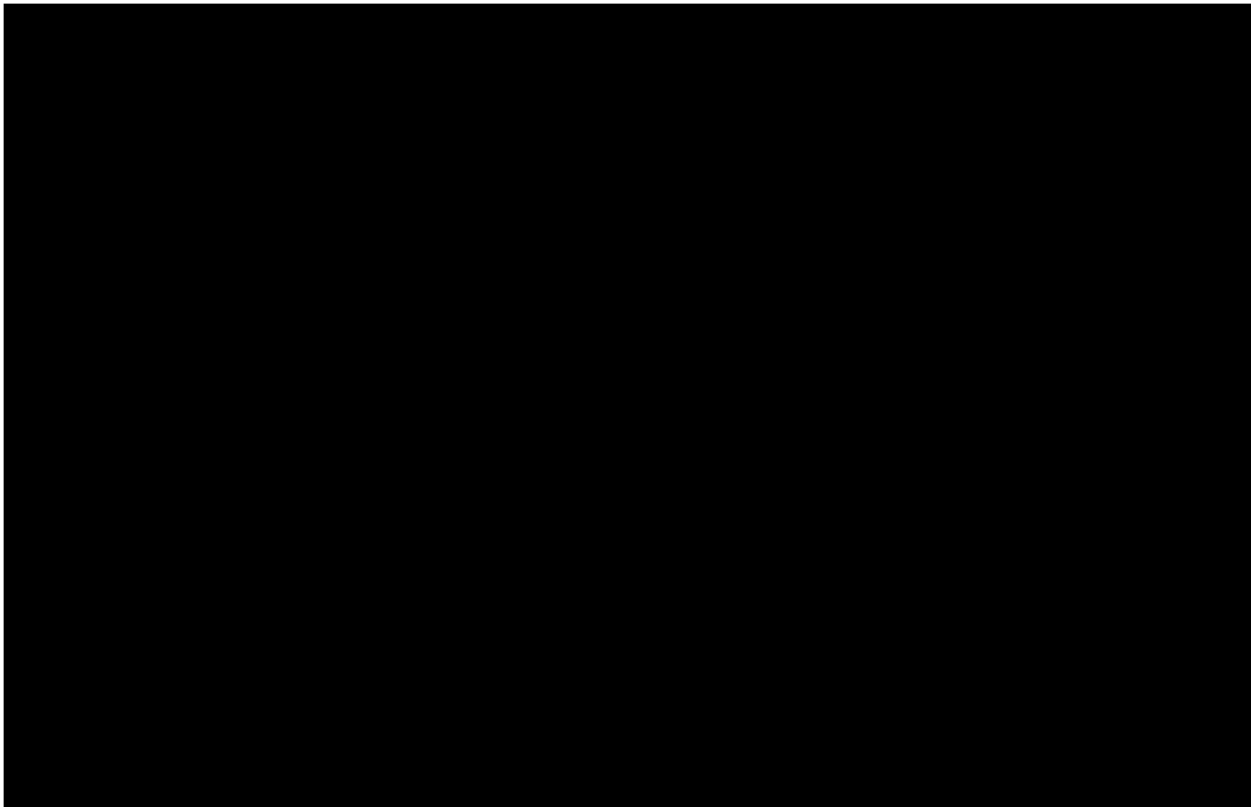
605. The FTC's theory also ignores that TiO₂ plants experience ups and downs in operating rates, many as the result of both planned and unplanned outages. (Stern, Tr. 3750).

Response to Proposed Finding No. 605

The Proposed Finding misleading, inaccurate and contrary to the weight of the evidence. Complaint Counsel identified and examined numerous instances in which TiO₂ plant operating rates were low. (CCFF ¶¶ 587-612, 619-30). Moreover the record evidence is clear that North American TiO₂ producers reduced output at times to increase price. On numerous occasions, Tronox publicly stated that it was “managing our production” so that “price will rise” and that Tronox planned to take “a very disciplined approach to production....” (PX9007 at 005 (Q1 2015 Tronox earnings call); PX9005 at 010 (Q3 2015 Tronox earnings call); PX9003 at 010-11 (Q1 2016 Tronox earnings call); PX5000 at 075-79 (¶¶ 179-84) (Hill Initial Report) (showing that North American chloride TiO₂ producers are aware that withholding output increases price); Hill, Tr. 1822-23 (confirming that { [REDACTED] } (in camera).

For example, on a May 2015 earnings call, Mr. Casey stated that it was Tronox's “view that an upward move in pigment selling prices will be predicated on a reduction of supply in the pigment market relative to demand, and/or an upward move in feedstock selling prices and we expect to see both.” (PX9007 at 005 (Q1 2015 Tronox earnings call)).

606. The FTC's theory also ignores the role of inventory levels. (Stern, Tr. 3749). Stern Figure 28 illustrates the Hamilton plant's operating rates superimposed against its inventory levels. (Stern, Tr. 3749; RX0171.0078).



Response to Proposed Finding No. 606

The Proposed Finding is misleading, inaccurate and contrary to the weight of the evidence. Dr. Hill analyzed inventory levels in the context of analyzing when the parties chose to withhold output, and comparing inventory levels during low utilization periods to inventory levels at all other times. (PX5002 at 006, 008 (¶ 8 & Figs. 1-3) (*in camera*)). The record evidence is clear, that the Respondents and other chloride TiO₂ suppliers recognize the benefits of strategically withholding chloride TiO₂ output in North America to increase prices relative to what otherwise would have prevailed. (CCFF ¶¶ 569-85).

607. Stern Figure 28 shows that, in periods such as 2012, 2013, and 2015, when inventories began to grow to unacceptable levels, production was slowed to reduce excess inventories. (Stern, Tr. 3749; RX0171.0078).

Response to Proposed Finding No. 607

The Proposed Finding is vague, misleading, incomplete, and contrary to the weight of the evidence. The term “unacceptable” is vague and unclear. The Proposed Finding does not include important industry information, including price and sales. (RX0171 at 078). It is also misleading and contrary to the weight of the evidence in that the chart shows other time periods where utilization was high despite high inventories, [REDACTED]. (RX0171 at 078).

608. In the second quarter of 2015, “Tronox suffered a downgrade from Moody’s because of the unacceptable level of working capital tied up in inventory.” (Stern, Tr. 3749).

Response to Proposed Finding No. 608

The Proposed Finding is misleading and incomplete, and relies solely on testimony from an expert for a factual assertion. Mr. Stern does not have the knowledge or expertise to state why Tronox was downgraded. (Stern, Tr. 3859-61).

D. Dr. Hill’s Capacity Closure Model Suffers from Numerous Fundamental Flaws, Including Ignoring Real-World Competition, Which Cause the Model to Artificially Predict Competitive Effects.

609. Dr. Hill supports his opinions regarding unilateral competitive effects using the “capacity closure” model.⁶⁸ (Hill, Tr. 1957-58, 1759).

Response to Proposed Finding No. 609

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence. Dr. Hill supported his opinions with both quantitative and qualitative analyses, which included the capacity closure model analyses, cournot model analyses, and the qualitative evidence that included sworn testimony and business documents. (CCFF ¶¶ 658-59). The qualitative evidence confirmed the results of Dr. Hill’s quantitative work. (CCFF ¶¶ 552-694).

⁶⁸ The second model Dr. Hill uses to support his opinions regarding unilateral competitive effects, the Cournot model, is discussed *infra* at ¶¶ 686-704.

610.

Instead, Dr. Hill’s model only predicts whether the “merger is likely to lead to increased *incentive* for the merged firm to withhold output, and that withholding of output will lead to a higher market price.” (Hill, Tr. 1760 (emphasis added)).

Response to Proposed Finding No. 610

The Proposed Finding is misleading, incomplete, contrary to the weight of the evidence, and the citation does not support the Proposed Finding. Dr. Hill did not make an admission that the capacity closure model was not used to calculate a measure of harm. Dr. Hill said that the *purpose* of the models was not to calculate a precise measure of harm, not that they were incapable of making such a calculation (Hill, Tr. 2053 (emphasis added) (*in camera*)). In fact, he calculates a measure of harm for each scenario in his capacity closure model. (PX5000 at 088 (Fig. 33) (Hill Initial Report) (*in camera*)).

The testimony cited in the second sentence of this Proposed Finding, is not discussing the capacity closure model. (Hill, Tr. 1760). It is discussing in general why the merger would likely harm competition. (Hill, Tr. 1760). On the very same transcript page, Dr. Hill makes it clear that he “examined both qualitative and quantitative information” in coming to his conclusion. (Hill, Tr. 1760). The qualitative evidence confirmed the results of Dr. Hill’s quantitative work. (CCFF ¶¶ 552-694).

611. For these reasons and those set forth below, Dr. Hill’s capacity closure model is “invalid” because it is “inconsistent with the real world.” (Shehadeh, Tr. 3329-30).

Response to Proposed Finding No. 611

The Proposed Finding is vague, misleading, incomplete and contrary to the weight of the record evidence. (See CCRRFF ¶¶ 609-85, above; see also CCFF ¶¶ 658-79).

a. Dr. Hill’s “Capacity Closure” Model Has Never Been Accepted by Courts or Subject to Peer Review.

612. Dr. Hill developed the “capacity closure” model himself. (Hill, Tr. 1958).

Response to Proposed Finding No. 612

The Proposed Finding is misleading to the extent that it insinuates that the capacity closure model has never been accepted by anyone other than Dr. Hill. The capacity closure model was used in a Tunney Act proceeding in which the Department of Justice had to demonstrate that a consent was reasonable and in the public interest and has been used in other investigations by the Department of Justice. (Hill, Tr. 1770-71; CCFF ¶ 662; PX7056 (Hill, Dep. at 129-130) (*in camera*)). Moreover, Dr. Hill submitted a sworn declaration in that matter. (Hill, Tr. 1770-71; CCFF ¶ 662). The court in that case upheld the consent decree as being reasonable and in the public interest. (Hill, Tr. 1770-71; CCFF ¶ 662).

613. Dr. Hill's "capacity closure" model "has not ever been published in an academic journal." (Hill, Tr. 1962). Dr. Hill's "capacity closure" model also "has not been subject to peer review" "in the publication of a paper." (Hill, Tr. 1961-62).

Response to Proposed Finding No. 613

The Proposed Finding is misleading to the extent that it insinuates that the capacity closure model has never been accepted by anyone other than Dr. Hill. The capacity closure model was used in a Tunney Act proceeding in which the Department of Justice had to demonstrate that a consent was reasonable and in the public interest. (Hill, Tr. 1770-71; CCFF ¶ 662). Moreover, Dr. Hill submitted a sworn declaration in that matter. (Hill, Tr. 1770-71; CCFF ¶ 662). The court in that case upheld the consent decree as being reasonable and in the public interest. (Hill, Tr. 1770-71; CCFF ¶ 662).

614. Neither Dr. Hill's report nor his testimony identified anyone other than Dr. Hill who has used his "capacity closure" model. (Hill, Tr. 1659-60, 1967). Dr. Hill testified that his "capacity closure" model "was accepted by a court" in "one case": the Tunney Act proceedings for the Abitibi-Bowater matter. (Hill, Tr. 1962, 1771). However, the Abitibi-Bowater court explained that "the relevant inquiry is whether the United States' conclusion about the adequacy of the Snowflake divestiture," which was based on the "capacity closure" model, "was reasonable, *not whether it was correct.*" (RX2010.0006 (emphasis added); Hill, Tr. 1964 (emphasis added)).

Response to Proposed Finding No. 614

The Proposed Finding is incomplete, misleading factually inaccurate and contrary to the weight of the evidence. Dr. Hill cites other authors who write about the capacity closure model. (Hill, Tr. 1770;1960-61). Additionally, the court in the Abitibi-Bowater matter found that the Snowflake divestiture was reasonable based on the capacity closure model, demonstrating that this is an acceptable model in district court case. (RX2010 at 006).

615. In fact, Dr. Hill’s “capacity closure” model has never been accepted by any appellate court. (Hill, Tr. 1771). Moreover, Dr. Hill “didn’t testify as an expert in court for that case.” (Hill Tr. 1962). Dr. Hill also never submitted an expert report in that case. (Hill, Tr. 1967). Dr. Hill was not deposed in that case. (Hill, Tr. 1967). Dr. Hill claims that he was previously “retained as a potential testifying expert” in three cases, but Dr. Hill did not submit an expert report, was not deposed, and did not testify in any of those cases. (Hill, Tr. 1659-60; Hill, Tr. 1967).⁶⁹

Response to Proposed Finding No. 615

The Proposed Finding is misleading and incomplete. The capacity closure model was used in a Tunney Act proceeding in which the Department of Justice had to demonstrate that a consent was reasonable and in the public interest. (Hill, Tr. 1770-71). Moreover, Dr. Hill submitted a sworn declaration in that matter. (Hill, Tr. 1770-71, 1962). The court in that case upheld the consent decree as being reasonable and in the public interest. (Hill, Tr. 1770-71).

616. Nowhere in the Merger Guidelines is there a reference to the “capacity closure” model that Dr. Hill used in his analysis for this case. (Hill, Tr. 1918).

Response to Proposed Finding No. 616

The Proposed Finding is inaccurate, misleading and incomplete. The capacity closure model is based on and tracks Section 6.3 of the Horizontal Merger Guidelines and is intended to

⁶⁹ For most of his professional life, Dr. Hill has worked on behalf of federal antitrust agencies. (PX5000-123). Prior to joining Bates White in July 2017, Mr. Hill worked for over a decade for federal antitrust agencies. (PX5000-123) Almost immediately after leaving government service, Dr. Hill was retained by Complaint Counsel around August 2017. (Hill, Tr. 1661).

allow a party to assess the incentives discussed in that section of the Guidelines. (PX9085 at 025-26 (Horizontal Merger Guidelines, § 6.3)). Additionally, the Horizontal Merger Guidelines do not cite any economic model by name, but do state that “the Agencies may construct economic models designed to quantify the unilateral price effects resulting from the merger.” (PX9085 at 024 (Horizontal Merger Guidelines, § 6.1)).

b. Dr. Hill’s Capacity Closure Model Fails Dr. Hill’s Own Basic Model Validity Test.

617. Dr. Hill claims that the capacity closure model’s “ability to accurately predict current behavior confirms that it is attuned to industry reality.” (Shehadeh, Tr. 3336-37). Dr. Hill claims that with the “capacity closure” model “you can check whether [the] model predicts that stand-alone firms have an incentive to withhold output and thereby confirm that the model’s predictions are consistent with observed behavior in the real world.” (Hill, Tr. 2001).

Response to Proposed Finding No. 617

The Proposed Finding is misleading and incomplete. The capacity closure model predicts that the transaction is likely to have an anticompetitive effect in the North American chloride TiO₂ market by increasing the incentives of the merged firm relative to each of the stand-alone firms to reduce output today. (Hill, Tr. 1858; CCFE ¶¶ 660-70). The quantitative evidence from both the capacity closure model and cournot model, along with the qualitative evidence confirm that the merger will likely increase the incentive of the merged firm to withhold output. (CCFE ¶¶ 636-57).

618. Dr. Hill agrees “that today, Chemours has the largest market share in [his] defined market of sales of chloride titanium dioxide to North American customers.” (Hill, Tr. 2002). As a result, it’s “especially important to run that model validity test for Chemours” because “[t]he logic of his model is that if you are a larger supplier, you have a greater incentive to withhold supply.” (Shehadeh, Tr. 3337-38).

Response to Proposed Finding No. 618

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Shehadeh overlooks that Chemours has recently taken steps to limit its potential

output by shuttering its Edge Moor plant and a line at New Johnsonville in 2015. (PX2055 at 024 (Cristal presentation) (*in camera*)). Dr. Shehadeh also ignores data, which suggests that [REDACTED] [REDACTED] (PX5004 at 044 (¶ 104) (Hill Rebuttal Report to Shehadeh) (*in camera*); PX1663 (2017 TZMI Pigment Producers Cost Study- native Excel spreadsheet) (TZMI data showing that [REDACTED]) (*in camera*)). Additionally, Dr. Hill did not have the detailed internal cost data from Chemours that he had from Tronox or Cristal, which is why he did not run the capacity closure model for stand alone Chemours. (CCFF ¶ 678; PX7056 (Hill, Dep. at 122-24) ([REDACTED] [REDACTED]) (*in camera*)).

619. Dr. Hill “runs [the capacity closure model validity] test for Tronox and Cristal.” (Shehadeh, Tr. 3330-31). However, Dr. Hill did not run his capacity closure model for a stand-alone Chemours in any of his reports. (Hill, Tr. 2002; Shehadeh, Tr. 3330-31). Dr. Shehadeh did. (Shehadeh, Tr. 3331).

Response to Proposed Finding No. 619

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. The Proposed Finding is misleading to the extent that it insinuates that Chemours has not restricted supply. Dr. Shehadeh overlooks that Chemours has recently taken steps to limit its potential output by shuttering its Edge Moor plant and a line at New Johnsonville in 2015. (PX2055 at 024 (Cristal presentation) (*in camera*)). Dr. Shehadeh also ignores data, which suggests that [REDACTED] [REDACTED] (PX5004 at 044 (¶ 104) (Hill Rebuttal Report to Shehadeh) (*in camera*)). Additionally, Dr. Hill did not have the detailed internal cost data from Chemours that he had from Tronox or Cristal. (PX7056 (Hill Dep. at 122-24) (*in camera*)).

620. [REDACTED] Dr. Hill admitted that his code was designed so as to “not permit you to run a stand-alone scenario for Chemours.” (Hill, Tr. 2004).

Response to Proposed Finding No. 620

The Proposed Finding is misleading, inaccurate and contrary to the weight of the evidence. The quote cited from PX5004 is Dr. Hill quoting Dr. Shehadeh's claim. (PX5004 at 069 (¶ 164) (Hill Rebuttal Report to Shehadeh)). Dr. Hill's code had no such restriction, and anyone who wanted to could have run such a test. (Hill, Tr. 2004). There is substantial evidence in the record that Chemours has not meaningfully responded to price increases of chloride TiO₂ in North America. (CCFF ¶¶ 653-56). For example, { [REDACTED] }
 [REDACTED]
 [REDACTED] } (PX7052 (O'Sullivan, Dep. at 146-47) (*in camera*)). Moreover, Dr. Shehadeh overlooks that Chemours has recently taken steps to limit its potential output by shuttering its Edge Moor plant and a line at New Johnsonville in 2015. (PX2055 at 024 (Cristal presentation) (*in camera*)). Dr. Shehadeh also ignores data, which suggests that { [REDACTED] } (PX5004 at 044 (¶ 104) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

621. Dr. Hill's capacity closure model fails this model validity test for Chemours. (Shehadeh, Tr. 3331, 3338).

Response to Proposed Finding No. 621

The Proposed Finding is misleading and incomplete. Dr. Hill did not have the detailed internal cost data from Chemours that he had from Tronox or Cristal. (PX7056 (Hill, Dep. at 122-24) (*in camera*)). Dr. Shehadeh also ignores data, which suggests that { [REDACTED] }
 [REDACTED] } (PX5004 at 044 (¶ 104) (Hill Rebuttal Report to Shehadeh) (*in camera*); PX1663 (2017 TZMI Pigment Producers Cost Study spreadsheet) (*in camera*)). Moreover, Chemours actually did reduce capacity in 2015. (CCFF ¶ 585).

622. When Dr. Hill's capacity closure model is run "for Chemours using his model and his data, it shows that Chemours' behavior predicted by the model is inconsistent with the behavior of Chemours as reflected in the" real world, and thus is not "attuned to industry reality." (Shehadeh, Tr. 3331, 3338). Dr. Hill acknowledged that his capacity closure model "predicted that Chemours should supply less to North America than Chemours is actually supplying according to Dr. Hill's model and data." (Hill, Tr. 2010).

Response to Proposed Finding No. 622

The Proposed Finding is misleading, vague, and incomplete. There is substantial evidence in the record that Chemours has not meaningfully responded to price increases of chloride TiO₂ in North America. (CCFF ¶¶ 653-56). For example, { [REDACTED] } (PX7052 (O'Sullivan, Dep. at 146-47) (*in camera*)). Moreover, Dr. Shehadeh overlooks that Chemours has recently taken steps to limit its potential output by shuttering its Edge Moor plant and a line at New Johnsonville in 2015. (PX2055 at 024 (Cristal presentation) (*in camera*)). Dr. Shehadeh also ignores data, which suggests that { [REDACTED] } (PX5004 at 044 (¶ 104) (Hill Rebuttal Report to Shehadeh) (*in camera*); PX1663 (2017 TZMI Pigment Producers Cost Study spreadsheet (*in camera*)).

The last sentence of the Proposed Finding is misleading and incomplete. First, what Dr. Hill actually stated was that Dr. Shehadeh's running of the model "predicted withholding in 2016 for Chemours" and that Chemours actually did withhold output at that time. (Hill, Tr. 2010). Second, the quotation is from Respondents' lawyer, not from Dr. Hill. (Hill, Tr. 2010).

623. Dr. Hill's capacity closure model fails the model validity test "because the competitive constraints in the real world are more significant than the competitive constraints that Dr. Hill allows in his model." (Shehadeh, Tr. 3340-41, 3363).

Response to Proposed Finding No. 623

The Proposed Finding is misleading and inaccurate. Dr. Hill's empirical work, as well as the weight of the qualitative evidence and data, demonstrate that real world market dynamics are accurately incorporated into the capacity closure model. (CCFF ¶¶ 671-79).

624. Dr. Hill admitted that he has "no reason to believe [Dr. Shehadeh] incorrectly ran the model" for stand-alone Chemours. (Hill, Tr. 2011).

Response to Proposed Finding No. 624

The Proposed Finding is incomplete and misleading to the extent it implies that Dr. Shehadeh's analysis is correct. Dr. Hill is referring only to the running of the model, not the appropriateness or accuracy of the data that Dr. Shehadeh used. (Hill, Tr. 2011). Dr. Hill specifically testified that he has criticisms of how Dr. Shehadeh ran the capacity closure model for stand-alone Chemours. (Hill, Tr. 2011). Dr. Shehadeh did not have the internal cost data that is required to accurately assess firms' incentives in the capacity closure model and thus his version of the model should not be relied upon. (CCFF ¶¶ 678; Hill, Tr. 2013).

625. More fundamentally, Dr. Hill "analyzed stand-alone Tronox premerger to see if it would have an incentive to withhold output absent the merger." (Hill, Tr. 2001). Dr. Hill's capacity closure model actually predicts that pre-merger Tronox "does *not* have an incentive to withhold output." (Hill, Tr. 2001 (emphasis added)). Indeed, Dr. Hill acknowledged that his model's prediction that pre-merger Tronox does not have an incentive to withhold output "is consistent with observed reality." (Hill, Tr. 2001). In other words, the prediction that pre-merger Tronox does not have an incentive to withhold output is consistent with "data for Tronox on its utilizations," which shows Tronox operating "at full utilization." (Hill, Tr. 2001).

Response to Proposed Finding No. 625

The Proposed Finding is misleading to the extent that it implies that there can be no harm from the merger because Tronox today does not have an incentive to withhold output. The record evidence, both quantitative and qualitative, is overwhelming that post-merger, Tronox will have an increased incentive to withhold output. (CCFF ¶¶ 636-57). Moreover, the record evidence is overwhelming that consistent with the predictions of the model, Tronox has actually restricted output on numerous occasions in the past. (CCFF ¶¶ 586-612).

626. [REDACTED]

Response to Proposed Finding No. 626

The Proposed Finding is misleading, incomplete, misconstrues the capacity closure model, and is contrary to the weight of the evidence because it only applies to one month in 2016. (PX5000 at 089 (Fig. 34) (Hill Initial Report); PX5002 at 006 (¶ 8 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). Dr. Hill is referring to { [REDACTED] } (PX7007 (Van Niekerk, Dep. at 064) (*in camera*); see also PX7024 (Harper, Dep. at 42) (*in camera*); PX9003 at 011 (Tronox Q1 2016 Earnings Call). { [REDACTED] } (Romano, Tr. 2165 (*in camera*)). Further, the capacity closure model does not consider whether a firm should produce less than their nameplate capacity, but rather whether that firm should withhold from their actual production; therefore, the capacity closure model does not rely on nameplate capacity, but on invoice data, which reflects the firm’s actual production. (PX5000 at 147 (¶¶ 333, 335) (Hill Initial Report) (*in camera*)). The model predicted neither standalone firm had an incentive to produce less than what it actually produced in 2016, demonstrating that the model passes this validity check. (PX5000 at 089 (Fig. 34), 147-50 (¶¶ 331-49) (Hill Initial Report); PX5002 at 006 (¶ 8 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*); CCF 671-79).

627. Dr. Hill also analyzed stand-alone Cristal and his model predicted that “stand-alone Cristal would not have an incentive to withhold output.” (Hill, Tr. 2060; Hill, Tr. 2001-02). [REDACTED]

Response to Proposed Finding No. 627

The Proposed Finding is misleading, incomplete, misconstrues the capacity closure model, and is contrary to the weight of the evidence. The capacity closure model does not consider whether a firm should produce less than their nameplate capacity, but rather whether that firm should withhold from their actual production; therefore, the capacity closure model does not rely on nameplate capacity, but on invoice data, which reflects the firm's actual production. (PX5000 at 147 (¶¶ 333, 335) (Hill Initial Report) (*in camera*)). The model predicted neither standalone firm had an incentive to produce less than what it actually produced in 2016, demonstrating that the model passes this validity check. (PX5000 at 089 (Fig. 34), 147-50 (¶¶ 331-49) (Hill Initial Report); PX5002 at 006 (¶ 8 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*); CCFE ¶¶ 671-79).

628. Dr. Hill's capacity closure model is invalid because "if a model can't explain the world as it is today, then it can't be relied on to explain the world as it could be with a change or could be in the future." (Shehadeh, Tr. 3334).

Response to Proposed Finding No. 628

The Proposed Finding is misleading, incomplete, misconstrues the capacity closure model, and is contrary to the weight of the evidence. First, the record evidence, both quantitative and qualitative, is overwhelming that post-merger, Tronox will have an increased incentive to withhold output. (CCFE ¶¶ 636-57). Second, the model predicted the firms did not have an incentive to withhold output beyond their actual production for the majority of 2016, which is consistent with what was observed in the real world, demonstrating that the model is consistent with the real world market dynamics. (PX5000 at 089 (Fig. 34), 147-50 (¶¶ 331-49) (Hill Initial Report) (*in camera*); PX5002 at 006 (¶ 8 & Fig. 1) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*); CCFE ¶¶ 671-79).

c. Dr. Hill's "Capacity Closure Model" Does Not Allow for Competitive Responses by Rivals, Thereby Predetermining Its Conclusion.

629. Dr. Hill “imposes constraints on the responses of rivals” in his capacity closure model. (Shehadeh, Tr. 3331).

Response to Proposed Finding No. 629

The Proposed Finding is misleading, incomplete, and contrary to the weight of the evidence. The only inputs used for the responses of rivals in the model are those that were empirically estimated by Dr. Hill using real-world data and thus reflecting real-world market dynamics. (CCFF ¶¶ 671-79).

630. Dr. Hill’s capacity closure model has three categories of imposed constraints on competitive responses of rivals: (1) no repatriation of exports by North American rivals; (2) no increased production or capacity by North American rivals; and (3) no increase in imports by North American rivals. (Shehadeh, Tr. 3331-32).⁷⁰

Response to Proposed Finding No. 630

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. The only inputs used for the responses of rivals are those that were empirically estimated by Dr. Hill using real-world, historical data to calculate various elasticities of demand (i.e., whether customers would switch to another product if TiO₂ prices rose) and supply (i.e., responsiveness of imports, export repatriation, and increases in North American output) to determine whether the output reduction would be profitable. (CCFF ¶¶ 667-79). Moreover, Dr. Hill always allowed for some imports to respond to price changes. (PX5000 at 148 (¶¶ 338-40) (Hill Initial Report) (*in camera*)). In his rebuttal, he allowed imports from the main North American suppliers to change as well as those from independent firms. (PX5000 at 148 (¶¶ 338-40) (Hill Initial Report) (*in camera*)). Additionally, there is no evidence that North American rivals could or would expand North American production beyond the growth in demand to offset a price increase in North

⁷⁰ After receiving Dr. Shehadeh’s criticisms, Dr. Hill re-ran his model to allow imports, but still assumed away any possible export repatriation or output expansion. (Hill, Tr. 1982-83).

America. (CCFF ¶¶ 678-79). Lastly, Dr. Hill does take into account export repatriation and there is no meaningful evidence that North American producers have ever repatriated their exports in response to a price increase. (CCFF ¶ 675; CCFF ¶¶ 640-46).

631. Dr. Hill “does not let these reactions happen”; it’s “built into the model” such that “that reaction is not something that can happen within the model.” (Shehadeh, Tr. 3332-33).

Response to Proposed Finding No. 631

The Proposed Finding is misleading, incomplete, contrary to the weight of the evidence and vague as to the term “reactions.” The only inputs use for the responses of rivals are those that were empirically estimated by Dr. Hill using real-world data. (CCFF ¶¶ 671-79; *see* CCRRFF ¶¶ 629-30, above). Moreover, Dr. Hill always allowed for some imports to respond to price changes. (PX5000 at 148 (¶¶ 338-40) (Hill Initial Report) (*in camera*)). In his rebuttal, he allowed imports from the main North American suppliers to change as well as those from independent firms. (PX5000 at 148 (¶¶ 338-40) (Hill Initial Report) (*in camera*); PX5004 at 044 (¶¶ 105-09 & Fig. 20) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

632. Dr. Hill acknowledges that these are the three possible responses that rivals could take in response to a reduction of TiO₂ output in North America: “if they changed their exports and used it to increase sales in North America, that would be one. Two would be increasing their imports into North America. And three would be bringing excess capacity if they had to to bear.” (Hill, Tr. 1981-82).

Response to Proposed Finding No. 632

The Proposed Finding is misleading and incomplete. These responses discussed by Dr. Hill were estimated using real-world data and implemented in the capacity closure model using the results of that estimation. (CCFF ¶¶ 671-79; *see* CCRRFF ¶¶ 629-31, above).

633. Dr. Hill’s capacity closure model is “inconsistent with the real world through the imposition of these constraints.” (Shehadeh, Tr. 3333-34). Because Dr. Hill’s capacity closure model “does not reflect competition in the real world,” it is “not reliable for evaluating the likely competitive effects of the proposed acquisition by Tronox of Cristal.” (Shehadeh, Tr. 3386-87).

Response to Proposed Finding No. 633

The Proposed Finding is inaccurate, misleading and contrary to the weight of the evidence. The rival responses implemented in Dr. Hill's capacity closure model were estimated using real-world data and are thus based on the actual responses of rivals to past market dynamics. (CCFF ¶¶ 671-79; *see* CCRRFF ¶¶ 629-32, above). The Proposed Finding is also vague as to the term "constraints."

634. Dr. Hill's imposed constraints on competition in the capacity closure model "result[s] in [its] predictions of price increases." (Shehadeh, Tr. 3329-30). Dr. Hill's imposed "constraint on the responses of customers and competitors" in his merger simulation models "lead him to conclude that there would be price effects [i.e., anti-competitive price increases] inappropriately." (Shehadeh, Tr. 3203).

Response to Proposed Finding No. 634

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. The parameters capturing rival response are only one piece in the capacity closure model, which predicts that the transaction will lead to an increased incentive for Tronox to unilaterally withhold output to increase price. (CCFF ¶¶ 668-70). Dr. Hill's ultimate conclusion that the merger is likely to have an anticompetitive effect is based on not just the capacity closure model, but also the Cournot model and his assessment of voluminous other qualitative and quantitative evidence. (CCFF ¶¶ 658-59; *see generally* CCFF ¶¶ 551-694). The qualitative evidence confirmed the results of Dr. Hill's quantitative work. (CCFF ¶¶ 552-694).

i. Dr. Hill's Model Permits No Export Repatriation by Rivals in Response to a SSNIP.

635. Dr. Hill's "capacity closure model does not allow for expansion of capacity" by any competitor "above and beyond the growth of demand." (Hill, Tr. 1983).

Response to Proposed Finding No. 635

The Proposed Finding is misleading and incomplete. Dr. Hill completed a detailed analysis of how supply might change as a result of a higher domestic price, including export repatriation,

and found that supply responses were unlikely to discipline a price increase. (CCFF ¶¶ 640-46). Dr. Hill incorporated this analysis into the capacity closure model, which thus reflects real world experience with respect to supply responses.

636. Instead, Dr. Hill's "capacity closure model assumes that no competitor will take TiO₂ that it currently exports out of North America and instead sell it in North America if there's a reduction of output." (Hill, Tr. 1983-84). In other words, Dr. Hill's capacity closure model "assumes that there is no export repatriation back into North America in response to [North American] price changes." (Hill, Tr. 1984). The assumption that North American rivals "won't keep some of those exports home in response to higher prices in his model" is deliberately "imposed" by Dr. Hill on his capacity closure model. (Shehadeh, Tr. 3341-42). As Dr. Hill succinctly put it: "There's no export repatriation allowed." (Hill, Tr. 1983).

Response to Proposed Finding No. 636

The Proposed Finding is misleading and incomplete. Dr. Hill calculated the export repatriation elasticity and found that exports were not responsive to changes in the domestic price. (CCFF ¶ 643). This elasticity was unrebutted by Dr. Shehadeh. (CCFF ¶ 675). Thus, Dr. Hill properly controls for export repatriation in his capacity closure model, which thus reflects real world experience with respect to the likelihood of export repatriation. (CCFF ¶¶ 640-46).

637. Dr. Hill's assumption of no export responses in his capacity closure model does not depend at all on how big or small the hypothetical price increase is. (Shehadeh, Tr. 3342-43). In other words, Dr. Hill's capacity closure model assumes no export response in North America even for the highest price increases predicted by his model. (Shehadeh, Tr. 3342-43).

Response to Proposed Finding No. 637

The Proposed Finding is misleading and incomplete. It is misleading in that Dr. Hill does not assume there is no export response, he empirically calculated the export response based on real-world data, so export repatriation was included in his analysis. (CCFF ¶¶ 640-46). Second, the Proposed Finding is incomplete in that it fails to acknowledge that prices between 2010 and 2012 rose over 70 percent, yet there was no meaningful export repatriation response in this time period and these real world responses are correctly captured in Dr. Hill's estimation and modeling.

(PX5004 at 009 (¶¶ 8-10) (Hill Rebuttal Report to Shehadeh) (*in camera*); PX5000 at 142-43 (¶¶ 319-20 & Fig. 48) (Hill Initial Report) (*in camera*); CCFE ¶¶ 636-57). As such, these model parameters were not only intentional, they were appropriate for the analysis. (CCFE ¶¶ 671-79).

638. For instance, Dr. Hill's capacity closure model "assumes no redirection of exports currently leaving North America so that they'd stay in North America even after a [domestic] price increase of **61 percent**." (Hill, Tr. 1984 (emphasis added)). Even "[u]nder the scenario where price in North America increased **79 percent**, [Dr. Hill's] model still assumes that no firm w[ould] repatriate any exports." (Hill, Tr. 1992 (emphasis added)).

Response to Proposed Finding No. 638

The Proposed Finding is misleading and incomplete. It is misleading in that Dr. Hill does not assume there is no export response, he empirically calculated the export response based on real-world, historical data. (CCFE ¶¶ 640-46). Second, this is incomplete in that it fails to acknowledge that prices between 2010 and 2012 rose over 70 percent, yet there was no meaningful export repatriation response in this time period and these real world responses are correctly captured in Dr. Hill's estimation and modeling. (PX5004 at 009 (¶¶ 8-10) (Hill Rebuttal Report to Shehadeh) (*in camera*); PX5000 at 142-43 (¶¶ 319-20 & Fig. 48) (Hill Initial Report) (*in camera*); CCFE ¶¶ 636-57). As such, these model parameters were not only intentional, they were appropriate for the analysis. (CCFE ¶¶ 671-79).

639. Dr. Hill's assumption of no export responses in his capacity closure model "doesn't depend on market definition." In other words, even if there were a discrete North American market, "a company selling into two distinct markets would still consider the relative profitability of those markets and respond." (Shehadeh, Tr. 3343).

Response to Proposed Finding No. 639

The Proposed Finding is misleading and incomplete. Dr. Hill does not assume there is no export response; he empirically calculates the export response based on real-world data, and the results of that analysis reflect the real-world responses of TiO₂ producers in terms of considering the relative profitability of different markets. (CCFE ¶¶ 640-46; *see* CCRRFF ¶ 638, above). This

includes the fact that even when North American prices increased more than 70%, there was no export repatriation response from North American producers. (PX5004 at 009 (¶¶ 8-10) (Hill Rebuttal Report to Shehadeh) (*in camera*); PX5000 at 142-43 (¶¶ 319-20 & Fig. 48) (Hill Initial Report) (*in camera*); CCFE ¶¶ 636-57). As such, these model parameters were not only intentional, they were appropriate for the analysis. (CCFE ¶¶ 671-79).

640. Dr. Hill described his assumptions that (i) North American producers of TiO₂ will *never* redirect exports to be sold instead within North America; (ii) North American producers will *never* increase capacity or output of TiO₂; and (iii) North American producers will *never* increase imports into North America as “intentional modeling choice[s].” (Hill, Tr. 1980-81.) Indeed, Dr. Hill affirmed that “precluding North American rivals from responding at all” is “a modeling feature” of his capacity closure model. (Hill, Tr. 1977, 1980; PX5004-069).

Response to Proposed Finding No. 640

The Proposed Finding is misleading and incomplete. Dr. Hill does not assume there are no supply responses. He empirically calculates the supply responses based on real-world, historical data, and those results reflect the real-world responses of TiO₂ producers. (CCFE ¶¶ 640-46). This includes the fact that even when North American prices increased more than 70%, there was no meaningful export repatriation response from North American producers. (PX5004 at 009 (¶¶ 8-10) (Hill Rebuttal Report to Shehadeh) (*in camera*); PX5000 at 142-43 (¶¶ 319-20 & Fig. 48) (Hill Initial Report) (*in camera*); CCFE ¶¶ 636-57). As such, these model parameters were not only intentional, they were appropriate for the analysis. (CCFE ¶¶ 671-79).

641. Even though Dr. Hill imposed these “intentional modeling choice[s]” and “modeling features” into his model, Dr. Hill conceded that one thing a firm could consider when “contemplating whether to change its export behavior” is to “compare the price currently obtained by selling outside of North America to the price to be obtained by selling in North America.” (Hill, Tr. 1980-81, 1934). Dr. Hill “noted that it’s possible that if the domestic price increases, domestic producers may reduce their exporting behavior and instead sell some of that output in the domestic market.” (Hill, Tr. 1931).

Response to Proposed Finding No. 641

The Proposed Finding is misleading and incomplete. While Dr. Hill did say this was possible, that is why he estimated what the likely supply responses would be, and ultimately found that producers do not respond to changes in the domestic price. (Hill, Tr. 1931; CCFF ¶¶ 640-46). This elasticity was un rebutted by Dr. Shehadeh. (CCFF ¶ 675).

642. Dr. Hill also acknowledged that “if one firm withholds output, then other firms may react in a way that may make that withholding unprofitable” for example if a competitor brings “a significant amount of their capacity to bear on the market and that capacity is low-cost, it may render the attempt to increase price unprofitable.” (Hill, Tr. 1772).

Response to Proposed Finding No. 642

The Proposed Finding is misleading and incomplete. Dr. Hill empirically calculates the supply responses of rivals based on real-world, historical data, and the results of that analysis reflect the real-world responses of TiO₂ producers. (CCFF ¶¶ 640-46). These were appropriately incorporated into the capacity closure model. (CCFF ¶¶ 671-79). Moreover, based on the quantitative and qualitative evidence, Dr. Hill concluded that a reduction in output post-merger would be profitable. (CCFF ¶¶ 658-74).

643. Dr. Hill further admitted that because Chemours is “the low-cost producer, presumably it could serve more of the North American market than it presently does,” such as by repatriating exports. (Hill, Tr. 1935-36).

Response to Proposed Finding No. 643

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Hill empirically calculates the export responses of rivals based on real-world data, and finds that North American producers are not sensitive to changes in the domestic price. (CCFF ¶¶ 640-646). This was appropriately incorporated into the capacity closure model. (CCFF ¶ 675). In fact, [REDACTED] } (PX5000 at 143 (Fig. 48) (Hill Initial Report) (*in camera*)). The

Proposed Finding also overlooks { [REDACTED] } (CCFF ¶ 678).

Further, Mr. O’Sullivan’s deposition also states that { [REDACTED] } (CCFF ¶ 653). In fact, Mr. O’Sullivan went on to say that { [REDACTED] } (CCFF ¶ 654).

644. [REDACTED]

Response to Proposed Finding No. 644

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Hill’s model incorporates real-world empirical data and thus reflects real-world competitive forces. (CCFF ¶¶ 640-46; 671-79). Further, Mr. O’Sullivan’s deposition also states that { [REDACTED] } (CCFF ¶ 653). In fact, Mr. O’Sullivan went on to say that { [REDACTED] } (CCFF ¶ 654). The Proposed Finding also overlooks { [REDACTED] } (CCFF ¶ 678).

645. [REDACTED]

Response to Proposed Finding No. 645

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Hill’s model incorporates real-world empirical data and thus reflects real-world competitive forces. (CCFF ¶¶ 671-79). Further, { [REDACTED] } Mr. O’Sullivan’s deposition specifically states that { [REDACTED] } (CCFF ¶ 653). In fact, Mr. O’Sullivan went on to say that { [REDACTED] } (CCFF ¶ 654). The Proposed Finding also overlooks { [REDACTED] } (CCFF ¶ 678).

646. [REDACTED]

Response to Proposed Finding No. 646

The Proposed Finding is misleading, incomplete, vague as to the term “competitive intensity,” and contrary to the weight of the evidence. Dr. Hill analyzed the competitive response of rivals in North America and found that { [REDACTED] } (CCFF ¶¶ 640-46). Mr. O’Sullivan also said that { [REDACTED] } (CCFF ¶ 654). Moreover, during this dialogue of questioning in his deposition, Mr. O’Sullivan testified that { [REDACTED] } (PX7052 (O’Sullivan, Dep. at 87-88) (*in camera*)).

647. [REDACTED]

Response to Proposed Finding No. 647

The Proposed Finding is misleading and inaccurate. Mr. O’Sullivan’s deposition occurred on April 18, 2018, 12 days after Dr. Hill’s initial report was due. Mr. O’Sullivan’s deposition was cited in Dr. Hill’s rebuttal report to Mr. Stern and Mr. Imburgia. (PX5002 at 013 (¶ 22), 017 (¶ 35) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)).

648. Dr. Hill further acknowledged that “if a firm increases its sales” in the domestic market “because of export repatriation, it would in some way mitigate the anticompetitive effect” of another firm withholding output. (Hill, Tr. 1931-32).

Response to Proposed Finding No. 648

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Hill empirically calculates the export responses of rivals based on real-world, historical data, and finds that { [REDACTED] } (CCFF ¶¶ 640-46). This was appropriately incorporated into the capacity closure model. (CCFF ¶ 675).

The Proposed Finding is also misleading because Dr. Hill was merely answering a hypothetical question. However, the evidence in this case is clear that there has been no meaningful export repatriation in response to price increases. (CCFF ¶ 675; *see also* CCFF ¶¶ 640-46).

649. Dr. Hill’s imposed constraint of no export responses in his capacity closure model is “inconsistent with the literature on the elasticity of exports of the United States for titanium dioxide.” (Shehadeh, Tr. 3343-44).

Response to Proposed Finding No. 649

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Hill empirically calculates the export responses of rivals based on real-world, historical data, and finds that North American producers are not sensitive to changes in the domestic price. (CCFF ¶¶ 640-46). This was appropriately incorporated into the capacity closure model. (CCFF ¶ 675).

Further, Dr. Shehadeh’s own statements with respect to export repatriation elasticity are incorrect and reflect his mischaracterization of academic papers. (CCFF ¶ 675; Hill, Tr. 1793-96).

650. Dr. Hill’s export regression is flawed because he “finds that exports don’t respond at all to changes in prices,” which is “inconsistent with economic logic.” (Shehadeh, Tr. 3343-44). It is also inconsistent with the “significant variation over time in the volume of exports out of North America” from a low of “approximately 425,000 [metric] tons” to “as high as maybe 700,000 metric tons.” (Shehadeh, Tr. 3346). Put differently, Dr. Hill’s assumption of no export responses by North American rivals to a sustained price increase “flies in the face of economic logic.” (Shehadeh, Tr. 3343-44).

Response to Proposed Finding No. 650

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Hill empirically calculates the export responses of rivals based on real-world, historical data, and finds that North American producers are not sensitive to changes in the domestic price. (CCFF ¶¶ 640-46). This was appropriately incorporated into the capacity closure model. (CCFF ¶ 675). The variation in exports over time here is irrelevant, since it was not presented alongside any price information to suggest exports vary *in response to price changes*. (Shehadeh, Tr. 3346). Dr. Hill did test whether exports were responsive to price, and found that they were not. (CCFF ¶ 643).

651. Dr. Hill’s assumption of no export responses in his capacity closure model has the effect of “making withholding strategies more profitable, and more profitable than they would be in the real world and, thus, creating an incentive where none exists.” (Shehadeh, Tr. 3344-45).

Response to Proposed Finding No. 651

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Hill does not assume there are no export responses. (CCFF ¶ 643). He empirically calculates the export response based on real-world, historical data, and finds that { [REDACTED] } (CCFF ¶¶ 640-46). As such, the incentives in the capacity closure model reflect the real-world incentives facing producers. (CCFF ¶¶ 671-79; PX3011 at 015 (September 2017 Kronos Investor Presentation) (“Baseline TiO2

Capacity Has Been Permanently Reduced With Limited Near-Term Ability to Increase Capacity”)).

652. After Dr. Shehadeh criticized Dr. Hill for not allowing Chemours, Venator, or Kronos to respond at all, Dr. Hill adjusted his code and released new results in his May 10 rebuttal report. (Hill, Tr. 1977-78). In his new model, he allowed North American rivals to adjust imports, but his model from May 10 “still doesn’t allow any competitor to vary exports out of North America or to bring excess capacity to bear.” (Hill, Tr. 1982-83).

Response to Proposed Finding No. 652

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Hill empirically calculates the export responses of rivals based on real-world data, and finds that { [REDACTED] } (CCFF ¶¶ 640-46). This market reality was appropriately incorporated into the capacity closure model. (CCFF ¶ 675).

ii. Dr. Hill’s Model Permits No Capacity Expansions by Competitors in Response to a SSNIP.

653. In addition to restricting the repatriation of exports, Dr. Hill “imposes” on his capacity closure model that rivals “cannot expand production, including through expanding capacity” in response to the price increases that his model predicts. (Shehadeh, Tr. 3332).

Response to Proposed Finding No. 653

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Hill’s model is consistent with the real-world in that there is no evidence that North American rivals could or would expand North American production capacity in the time frame that the capacity closure model evaluates to offset a price increase in North America. (CCFF ¶¶ 677-79; PX3011 at 015 (September 2017 Kronos Investor Presentation) (“Baseline TiO₂ Capacity Has Been Permanently Reduced With Limited Near-Term Ability to Increase Capacity”)).

654. Dr. Hill’s imposed constraint of no production or capacity increases by North American rivals is inconsistent with the “significant capacity additions year-in and year-out” undertaken by TiO₂ producers “in order to serve new demand.” (Shehadeh, Tr. 3356-58).

Response to Proposed Finding No. 654

The Proposed Finding is incomplete, misleading, contrary to the weight of the evidence, and vague as to the word “significant.” There have been a number of years in which production capacity has been permanently taken offline. (CCFF ¶¶ 430, 590, 620, 718; PX3011 at 015 (September 2017 Kronos Investor Presentation) (“Baseline TiO₂ Capacity Has Been Permanently Reduced With Limited Near-Term Ability to Increase Capacity”)). Further, there is no evidence that North American rivals could or would expand North American production to offset a price increase in North America within the timeframe that the capacity closure model evaluates. (CCFF ¶¶ 677-79; PX3011 at 015 (September 2017 Kronos Investor Presentation) (“Baseline TiO₂ Capacity Has Been Permanently Reduced With Limited Near-Term Ability to Increase Capacity”)).

655. In fact, the capacity expansions that are currently taking place year-in and year-out in the TiO₂ industry “are happening at current prices” and “would only be hastened and expanded in response to” a price increase in North America. (Shehadeh, Tr. 3358).

Response to Proposed Finding No. 655

The Proposed Finding is incomplete, misleading, and contrary to the weight of the evidence. There have been a number of years in which production capacity has been permanently taken offline. (CCFF ¶¶ 430, 590, 620, 718; PX3011 at 015 (September 2017 Kronos Investor Presentation) (“Baseline TiO₂ Capacity Has Been Permanently Reduced With Limited Near-Term Ability to Increase Capacity”)). Further, there is no evidence that North American rivals could or would expand North American production to offset a price increase in North America within the timeframe that the capacity closure model evaluates. (CCFF ¶¶ 677-79; PX3011 at 015 (September 2017 Kronos Investor Presentation) (“Baseline TiO₂ Capacity Has Been Permanently Reduced With Limited Near-Term Ability to Increase Capacity”)).

656. Dr. Hill's imposed constraint of no production or capacity increases by North American rivals is also inconsistent with the economic data showing the "ability to bring new capacity online, whether through debottlenecking and increasing the capacity of existing lines or adding lines to existing plants." (Shehadeh, Tr. 3357-58). Thus, Dr. Hill's "assumption in his model" of no competitive responses in terms of capacity expansions "is inconsistent with what we see as the adjustment to capacity in the real world." (Shehadeh, Tr. 3362).

Response to Proposed Finding No. 656

The Proposed Finding is incomplete, misleading, and contrary to the weight of the evidence. Dr. Hill's models are based off empirical estimates using real-world, historical data. (CCFF ¶¶ 640-46, 671-79). There have been a number of years in which production capacity has been permanently taken offline. (CCFF ¶¶ 430, 590, 620, 718; PX3011 at 015 (September 2017 Kronos Investor Presentation) ("Baseline TiO₂ Capacity Has Been Permanently Reduced With Limited Near-Term Ability to Increase Capacity")). Further, there is no evidence that North American rivals could or would expand North American production to offset a price increase in North America within the timeframe that the capacity closure model evaluates. (CCFF ¶¶ 677-679; PX3011 at 015 (September 2017 Kronos Investor Presentation) ("Baseline TiO₂ Capacity Has Been Permanently Reduced With Limited Near-Term Ability to Increase Capacity"))).

iii. Dr. Hill's Model Restricts Imports into North America by Rivals in Response to a SSNIP.

657. In addition to restricting exports and capacity expansions, Dr. Hill further "imposes" on the capacity closure model the "assumption that rivals to Tronox and Cristal cannot and will not increase imports into North America in response to the higher prices that his model predicts." (Shehadeh, Tr. 3332).

Response to Proposed Finding No. 657

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence. Dr. Hill estimates the import response of rivals and non-rivals into North America with respect to domestic prices using real-world, historical data and finds it unlikely that imports would discipline a price increase. (CCFF ¶¶ 640-46). Thus, real world import responses are appropriately

incorporated into the capacity closure model. (CCFF ¶¶ 672-74, 676). Moreover, Dr. Hill buttresses his conclusion by showing that after accounting for various import elasticities, including Dr. Shehadeh’s methodology, and applying it to all imports, that the model still predicts that the merged firm has an increased incentive to reduce output post-merger. (CCFF ¶ 674).

658. Specifically, Dr. Hill’s capacity closure model “does not allow Chemours, Kronos or Venator to import any additional material into North America in response to a price increase by the merged firm.” (Hill, Tr. 1983). For example, Dr. Hill’s model imposes the assumption that “Chemours’ plant in [Altamira], Mexico, cannot increase its supply to Dr. Hill’s candidate North America in his capacity closure model.” (Shehadeh, Tr. 3332).

Response to Proposed Finding No. 658

The Proposed Finding is inaccurate, misleading and contrary to the weight of the evidence. Dr. Hill allowed all imports to fluctuate in the model described in his rebuttal report to Dr. Shehadeh and reached the same conclusion as his initial report. (CCFF ¶ 676).

659. By restricting import responses, Dr. Hill’s capacity closure model predicts price increases “that won’t arise in the real world because it fails to account for the real world competitive constraints, in this case the ability of customers in North America to seek supply from international sources of supply.” (Shehadeh, Tr. 3369).

Response to Proposed Finding No. 659

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence. Dr. Hill estimates the import response of rivals and non-rivals into North America with respect to domestic prices using real-world, historical data and finds it unlikely that imports would discipline a price increase. (CCFF ¶¶ 640-46). This finding is appropriately incorporated into the capacity closure model. (CCFF ¶¶ 672-74, 676).

660. Dr. Hill’s restriction on import responses by North American rivals in his capacity closure model is inconsistent with the economic evidence, which shows “imports responding to new demand,” and the economic literature, which shows “the responsiveness of imports” to prices. (Shehadeh, Tr. 3365-66).

Response to Proposed Finding No. 660

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence. Dr. Hill estimates the import response of rivals and non-rivals into North America with respect to domestic prices using real-world, historical data and finds it unlikely that imports would discipline a price increase. (CCFF ¶¶ 640-46). This finding is appropriately incorporated into the capacity closure model. (CCFF ¶¶ 672-74, 676). Further, Dr. Shehadeh’s own estimate of import response appears to be based on a superficial assessment of a figure in Dr. Hill’s report showing slight fluctuations in TiO₂ import volumes, coupled with an assumption by Dr. Shehadeh that the minor shifts corresponded to North American price changes. (Shehadeh, Tr. 3365 (“When we looked at those charts, we saw variation over time”)). But he made no attempt to determine whether such a relationship existed. Further, his estimate is inconsistent with the economic literature due to his misreading of an academic paper. (CCFF ¶ 673).

d. If Dr. Hill’s Capacity Closure Model Allowed Even Slight Competitive Responses of Rivals, It Would Show All Unilateral Reduction Scenarios to Be Unprofitable.

661. Once “one accounts for the responses in the real world that would arise in response to the price increases” predicted by Dr. Hill’s capacity closure model, that model “would no longer predict the price increases that Dr. Hill references.” (Shehadeh, Tr. 3330).

Response to Proposed Finding No. 661

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Hill empirically calculates the supply responses of rivals based on real-world, historical data, and the results of that analysis reflect the real-world responses of TiO₂ producers. (CCFF ¶¶ 640-46). These real world responses were appropriately incorporated into the capacity closure model. (CCFF ¶¶ 671-79).

662. If Dr. Hill’s capacity closure model allowed for export responses to price increases in North America, “[i]t would predict that no price increase would be profitable and no capacity closure would be profitable.” (Shehadeh, Tr. 3355).

Response to Proposed Finding No. 662

The Proposed Finding is misleading, incomplete, vague as to the term “export response,” and contrary to the weight of the evidence. Dr. Hill empirically calculates the export responses of rivals based on real-world, historical data, and finds that North American producers are not sensitive to changes in the domestic price. (CCFF ¶¶ 640-46). This was appropriately incorporated into the capacity closure model. (CCFF ¶ 675). Predictions based on an incorrect set of parameters are not relevant.

663. Dr. Shehadeh found that allowing a competitive response by rivals of just 24 kilotons per year (“ktpa”) “would render the prices increases across all of his model scenarios unprofitable.” (Shehadeh, Tr. 3370-71; Shehadeh, Tr. 3382-83). 24 ktpa is a relatively miniscule amount. (Shehadeh, Tr. 3371-72). For example, 24 ktpa is “less than 2 percent of the chloride produced titanium dioxide capacity in the hands of rivals.” (Shehadeh, Tr. 3371).

Response to Proposed Finding No. 663

The Proposed Finding is incomplete, misleading, contrary to the weight of the evidence and vague as to the phrase “relatively miniscule.” It omits the fact that such a response is unlikely, as shown by Dr. Hill’s analysis. (CCFF ¶ 679). Further, the 25 ktpa response required to offset a price increase in the capacity closure model reflects a larger response than the Proposed Finding suggests, { [REDACTED] [REDACTED] } (CCFF ¶ 679). Specifically, Dr. Hill’s analysis, which focused on both quantitative and qualitative evidence, found that such a response was not likely. (CCFF ¶¶ 671-79). The qualitative evidence confirmed the results of Dr. Hill’s quantitative work. (CCFF ¶¶ 552-694).

664. In other words, if Dr. Hill’s model “were to permit only 2 percent of global-produced [chloride-process only] titanium [dioxide] capacity in the hands of rivals to respond to these prices increases in North America, then the model would no longer predict the price increases that Dr. Hill proposes.” (Shehadeh, Tr. 3371-72).

Response to Proposed Finding No. 664

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence. It omits the fact that such a response is unlikely, as shown by Dr. Hill’s analysis. (CCFF ¶ 679). Specifically, Dr. Hill’s analysis, which focused on both quantitative and qualitative evidence, found that such a response was not likely. (CCFF ¶¶ 671-79). Further, the 25 ktpa response required to offset a price increase in the capacity closure model reflects a larger response than the finding suggests, { [REDACTED] } (CCFF ¶ 679).

Specifically, Dr. Hill’s analysis, which focused on both quantitative and qualitative evidence, found that such a response was not likely. (CCFF ¶¶ 671-79).

665. 24 ktpa is also equivalent to “approximately 0.4 percent” of all global TiO₂ capacity, irrespective of chloride-process or sulfate-process. (Shehadeh, Tr. 3372).

Response to Proposed Finding No. 665

The Proposed Finding is irrelevant, incomplete, and misleading. North American consumers demand chloride TiO₂ and will not switch to sulfate TiO₂. (CCFF ¶¶ 46-110). North American customers demand chloride TiO₂ because of their requirements for certain specifications that only chloride TiO₂ contains. (CCFF ¶¶ 46-110). So comparing the required increase to sulfate production is irrelevant. (CCFF ¶¶ 41, 61, 67). Further, the 25 ktpa response required to offset a price increase in the capacity closure model reflects a larger response than the finding suggests, { [REDACTED] } (CCFF ¶ 679).

Specifically, Dr. Hill’s analysis, which focused on both quantitative and qualitative evidence, found that such a response was not likely. (CCFF ¶¶ 671-79).

666. If Dr. Hill's model were to permit only 0.4 percent of all global TiO₂ capacity, irrespective of chloride-process or sulfate-process, to respond to his model's predicted price increases in North America, then the model "would no longer find those price increases profitable." (Shehadeh, Tr. 3372-73).

Response to Proposed Finding No. 666

The Proposed Finding is irrelevant, incomplete, misleading and contrary to the weight of the evidence. North American consumers overwhelmingly demand chloride, so comparing the required increase to sulfate production is misleading and irrelevant, since North American consumers are unlikely to switch to sulfate in the face of a SSNIP. (CCFF ¶¶ 41, 61, 67, 679). Further, the 25 ktpa response required to offset a price increase in the capacity closure model reflects a larger response than the Proposed Finding implies, { [REDACTED] [REDACTED] [REDACTED] } (CCFF ¶ 679). Specifically, Dr. Hill's analysis, which focused on both quantitative and qualitative evidence, found that such a response was not likely. (CCFF ¶¶ 671-79).

667. To be clear, a 24 ktpa response would be sufficient to render *all* of Dr. Hill's model scenarios unprofitable, including price increases that "range from 5 percent to as high as 61 percent across his capacity closure models." (Shehadeh, Tr. 3370-71, 3373).

Response to Proposed Finding No. 667

The Proposed Finding is incomplete, misleading and contrary to the weight of the evidence. It omits the fact that such a response is unlikely, as shown by Dr. Hill's analysis. (CCFF ¶ 679). Further, the 25 ktpa response required to offset a price increase in the capacity closure model reflects a larger response than the finding suggests, { [REDACTED] [REDACTED] [REDACTED] } (CCFF ¶ 679). Moreover, { [REDACTED] [REDACTED] [REDACTED] }

[REDACTED] } (PX5004 at 044-45 (¶¶ 105-09 & Fig. 20) (Hill Rebuttal Report to Shehadeh) (*in camera*)). Not only did Dr. Shehadeh have a mathematical error when calculating the required rival response, but his allegation is also false because it misses the fact that it is unprofitable for the merged firm to idle three lines, but that there are four other scenarios that would be profitable. (PX5004 at 045 (Fig. 20) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

668. 24 ktpa “is a small number . . . given that we’re talking about a foreseeable and sustained relative price increase” as high as 61 percent. (Shehadeh, Tr. 3373-74).

Response to Proposed Finding No. 668

The Proposed Finding is incomplete, misleading, vague as to the term “small,” and contrary to the weight of the evidence. The Proposed Finding omits the fact that such a response is unlikely, as shown by Dr. Hill’s analysis. (CCFF ¶ 679). Further, the 25 ktpa response required to offset a price increase in the capacity closure model reflects a larger response than the finding suggests,

[REDACTED]

[REDACTED] } (CCFF ¶ 679).

669. Dr. Hill acknowledges that “a rival response of 24,961 [ktpa] is sufficient to render closing three production lines unprofitable.” (Hill, Tr. 1985). Dr. Hill never calculated whether rival responses of 25 ktpa would render any other scenarios unprofitable. (Hill, Tr. 1986).

Response to Proposed Finding No. 669

The Proposed Finding is irrelevant, misleading and contrary to the weight of the evidence. First, Dr. Hill’s analysis revealed that such a response by rivals would be unlikely. (CCFF ¶ 679). Second, applying the same level of response to a smaller price increase would incorrectly change the implied price elasticity of supply, which measures the responsiveness of firms to changes in price. (PX5004 at 045 (¶ 108) (Hill Rebuttal Report to Shehadeh) (*in camera*)). Dr. Hill estimated

the correct price elasticity using real-world, historical data and incorporated it into his analysis. (CCFF ¶¶ 640-46, 671-79).

e. Dr. Hill Admittedly Made a Number of “Mistakes” and “Errors” in His “Capacity Closure” Model.

670. Dr. Hill admitted to making “errors” and “mistakes” in his capacity closure model. (Hill, Tr. 1969, 1828-29,).

Response to Proposed Finding No. 670

The Proposed Finding is misleading and incomplete in that Dr. Hill’s “errors and mistakes” were only in the April 6 report and only applied to a set of code, which was corrected as soon as the errors were discovered and replaced by the April 18 report in which all errors were corrected. (Hill, Tr. 1829 (*in camera*)). Moreover, Complaint Counsel agreed to nearly double their time to respond to the April 18 report. Finally, as Dr. Hill testified, { [REDACTED] [REDACTED] [REDACTED] } (Hill, Tr. 1829 (*in camera*)).

671. Dr. Hill submitted an initial expert report dated April 6, 2018. (Hill, Tr. 1967-68; RX1649). After Dr. Hill submitted his April 6 report, he “discovered that there were some errors in the code” “related specifically to some MATLAB code that [he] had used for the capacity closure model.” (Hill, Tr. 1969).

Response to Proposed Finding No. 671

The Proposed Finding is misleading and incomplete in that the April 18 report corrected all errors in the code and replaced the April 6 report. (Hill, Tr. 1829 (*in camera*)). Moreover, Complaint Counsel agreed to nearly double their time to respond to the April 18 report. Finally, as Dr. Hill testified, { [REDACTED] [REDACTED] [REDACTED] } (Hill, Tr. 1829 (*in camera*)).

672. [REDACTED]

Response to Proposed Finding No. 672

The Proposed Finding is misleading and incomplete in that the April 18 report contained none of these mistakes. (Hill, Tr. 1829 (*in camera*)). Moreover, Complaint Counsel agreed to nearly double their time to respond to the April 18 report. Finally, as Dr. Hill testified, { [REDACTED] [REDACTED] [REDACTED] } (Hill, Tr. 1829 (*in camera*)).

673. But Dr. Hill claimed “that there are only a few errors to the code.” (Hill, Tr. 1972). At his deposition, Dr. Hill could only remember one change to the code which he described “as literally a case of a minus sign that should have been a plus sign or vice versa.” (Hill, Tr. 1969-70).

Response to Proposed Finding No. 673

The Proposed Finding is misleading and incomplete. While one error in the code was “literally the matter of a plus sign and a minus sign” (Hill, Tr. 1973-74), the April 18 report corrected all errors and replaced the April 6 report. (Hill, Tr. 1829 (*in camera*)). Moreover, Complaint Counsel agreed to nearly double their time to respond to the April 18 report. Finally, as Dr. Hill testified, { [REDACTED] [REDACTED] [REDACTED] } (Hill, Tr. 1829 (*in camera*)).

674. Dr. Hill retracted his April 6 report and issued a corrected expert report dated April 18. (Hill, Tr. 1967-68).

Response to Proposed Finding No. 674

The Proposed Finding is misleading to the extent that it implies that Respondents or Respondents’ expert were disadvantaged or harmed in any way from the correction of a coding error. Moreover, Complaint Counsel agreed to nearly double their time to respond to the April 18

report. Finally, as Dr. Hill testified, { [REDACTED]

[REDACTED] } (Hill, Tr. 1829 (*in camera*)).

675. Dr. Hill never mentioned his April 6 report on direct examination. (Hill, Tr. 1968).

Response to Proposed Finding No. 675

The Proposed Finding is misleading and incomplete. Dr. Hill’s April 18 report is substantively identical to the April 6 report, merely correcting coding errors, and it served to replace the April 6 report. (Hill, Tr. 1829 (*in camera*)). Complaint Counsel agreed to nearly double their time to respond to the April 18 report. Moreover, Dr. Hill does refer to his initial report in his direct examination. (Hill, Tr. 1829 (*in camera*)). Finally, as Dr. Hill testified, { [REDACTED]

[REDACTED] } (Hill, Tr. 1829 (*in camera*)).

676. In Dr. Hill’s April 6 report, his capacity closure “model predicted that the most profitable scenario to the merged firm was to idle two lines at Hamilton.” (Hill, Tr. 1968). By contrast, in Dr. Hill’s “April 18 report, [his] model run with its revised code no longer shows idling two lines at Hamilton as the most profitable scenario for the merged firm”; instead, the “revised code predicts that idling three lines at Hamilton is the most profitable scenario for the merged firm.” (Hill, Tr. 1976).

Response to Proposed Finding No. 676

The Proposed Finding is irrelevant, misleading and incomplete. Dr. Hill’s initial report filed on April 18 includes the correct results of his capacity closure model, and replaced the April 6 report. (Hill, Tr. 1829 (*in camera*)). Complaint Counsel agreed to nearly double their time to respond to the April 18 report. Finally, as Dr. Hill testified, { [REDACTED]

[REDACTED] } (Hill, Tr. 1829 (*in camera*)).

677. But even comparing results from the two lines at Hamilton scenarios show dramatic changes: in the April 18 report, the two-line scenario is “no longer the most profitable scenario,” it would result in “a 31 percent predicted price increase,” and would result in “a net gain of 122 million” to the merged firm. (Hill, Tr. 1990-91).

Response to Proposed Finding No. 677

The Proposed Finding is vague as to the word “dramatic,” unsupported by the provided testimony, misleading, incomplete and contrary to the weight of the evidence. The Proposed Finding does not compare the “two lines at Hamilton scenario” to any other specific scenario or otherwise provide a point of reference for any such comparison. The Proposed Finding itself is also misleading and vague, as it appears to refer to the finding in RCFE ¶ 676, but that would incorrectly compare two completely different models in Dr. Hill’s report. This finding is listed under a heading of unilateral effects, but the model cited from the April 18 report in which { [REDACTED] } and not related to the model described in 676. (PX5000 at 151 (Fig. 49) (Hill Initial Report) (*in camera*)).

678. Dr. Hill’s April 6 report predicted the most profitable scenario “resulted in a net gain [to the merged firm] of \$22 million.” (Hill, Tr. 1968-69). But “after a few corrections” to his code, Dr. Hill’s “revised April 18 report calculates a net gain of \$32 million” to the merged firm under the most profitable scenario. (Hill, Tr. 1976).

Response to Proposed Finding No. 678

The Proposed Finding is irrelevant, misleading, and contrary to the weight of the evidence. Dr. Hill’s initial report filed on April 18 includes the correct results of his capacity closure model, and replaced the April 6 report. (Hill, Tr. 1829 (*in camera*)). Complaint Counsel agreed to nearly double their time to respond to the April 18 report. Finally, as Dr. Hill testified, { [REDACTED] }

[REDACTED] } (Hill, Tr. 1829 (*in camera*)).

679. The errors and mistakes in Dr. Hill’s capacity closure model result in “very, very significant changes in the predictions of the model,” and therefore show “the underlying sensitivity and ultimately unreliability of the model.” (Shehadeh, Tr. 3437-39). These substantial errors and mistakes in Dr. Hill’s capacity closure model, and the inherent unreliability of the model partly explain why the model fails “validity tests” and fails “to incorporate real-world competitive responses.” (Shehadeh, Tr. 3439-40).

Response to Proposed Finding No. 679

The Proposed Finding is vague as to the terms “very, very significant” and “substantial.” These terms were never defined by Dr. Shehadeh or Respondent Counsel and their meaning in this context is unclear. The Proposed Finding is also misleading. Dr. Hill explained that the corrections to his model actually strengthened his results, meaning that his substantive conclusions were unchanged. (Hill, Tr. 1829). Dr. Hill also performed validity tests that confirmed his model correctly predicted behavior of the merging firms in the but-for world. (Hill, Tr. 2001-2002). He also ran econometric tests on actual data to establish that the underlying parameters of his models reflected the likely real-world competitive responses (Hill, Tr. 1773-1775), unlike Dr. Shehadeh, who incorrectly relied on an academic paper instead of calculating his own parameters using the real-world data that he had at his disposal. (Shehadeh, Tr. 3588; Hill, Tr. 1793-96).

680. The inherent unreliability and sensitivity of Dr. Hill’s capacity closure model can be observed simply by evaluating the “predicted price change in the preferred strategy in his coordinated capacity closure model.” (Shehadeh, Tr. 3440). By comparing the original results of his model to the new results of his model, it shows “very significant differences in which strategies are preferred.” (Shehadeh, Tr. 3440-41).

Response to Proposed Finding No. 680

The Proposed Finding is irrelevant and misleading. There is only one set of capacity closure model results, and those are displayed correctly in the April 18 report, which as Respondents clearly know, replaced the April 6 report. (Hill, Tr. 1829 (*in camera*)). Further, the corrections

only strengthened the magnitude of the resulting incentive to withhold output, leaving the substantive conclusions of the model unchanged. (Hill, Tr. 1829 (*in camera*)). Finally, as Dr. Hill testified, [REDACTED]

[REDACTED]

[REDACTED] } (Hill, Tr. 1829 (*in camera*)).

681. [REDACTED]

[REDACTED]

[REDACTED]

Response to Proposed Finding No. 681

The Proposed Finding is irrelevant and misleading. There is only one set of capacity closure model results, and those are displayed correctly in the April 18 report, which as Respondents clearly know, replaced the April 6 report. (Hill, Tr. 1829 (*in camera*)). As Dr. Hill testified, { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (Hill, Tr. 1829 (*in camera*)).

682. [REDACTED]

[REDACTED]

Response to Proposed Finding No. 682

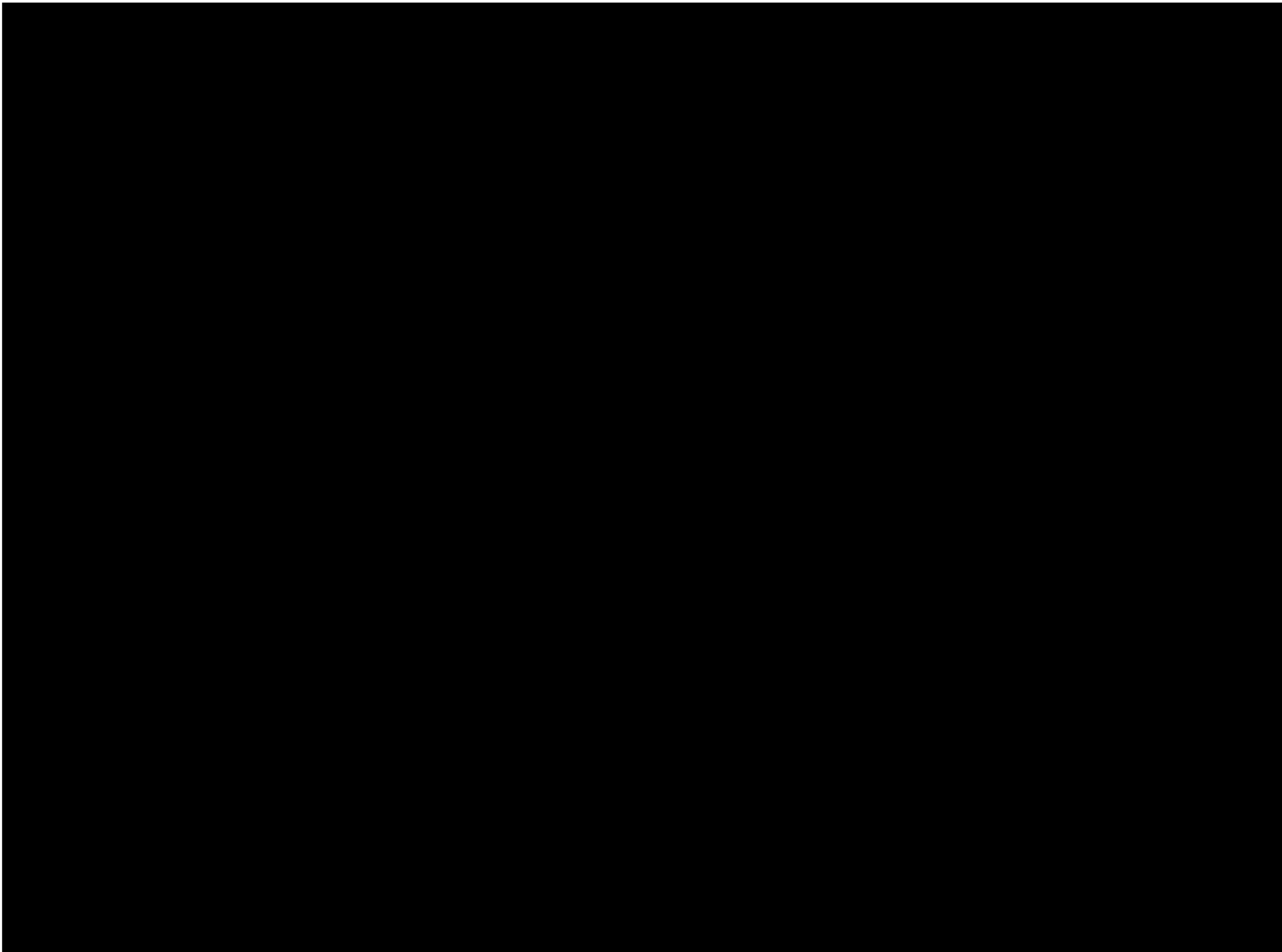
The Proposed Finding is irrelevant and misleading. There is only one set of capacity closure model results, and those are displayed correctly in the April 18 report, which as Respondents clearly know, replaced the April 6 report.. (Hill, Tr. 1829 (*in camera*)). Further, the code corrections only strengthened the magnitude of the resulting incentive to withhold output, leaving the substantive conclusions of the model unchanged. (Hill, Tr. 1829 (*in camera*)). Finally, as Dr. Hill testified, { [REDACTED]

[REDACTED]

[REDACTED] } (Hill, Tr. 1829 (*in camera*)).

683. The errors and mistakes also substantially affect the profitability rankings of Dr. Hill's model scenarios. [REDACTED]

[REDACTED]



Response to Proposed Finding No. 683

The Proposed Finding is irrelevant and misleading. There is only one set of capacity closure model results, and those are displayed correctly in the April 18 report, which as Respondents clearly know, replaced the April 6 report. (Hill, Tr. 1829 (*in camera*)). Further, the code corrections only strengthened the magnitude of the resulting incentive to withhold output, leaving the substantive conclusions of the model unchanged. (Hill, Tr. 1829 (*in camera*)). Finally, as Dr. Hill testified, [REDACTED]

[REDACTED]

[REDACTED] } (Hill, Tr. 1829 (*in camera*)).

684. [REDACTED]

[REDACTED]

Response to Proposed Finding No. 684

The Proposed Finding is irrelevant and misleading. There is only one set of capacity closure model results, and those are displayed correctly in the April 18 report, which as Respondents clearly know, replaced the April 6 report. (Hill, Tr. 1829 (*in camera*)). Further, the code corrections only strengthened the magnitude of the resulting incentive to withhold output, leaving the substantive conclusions of the model unchanged. (Hill, Tr. 1829 (*in camera*)). Finally, as Dr. Hill testified, { [REDACTED]

[REDACTED]
[REDACTED] } (Hill, Tr. 1829 (*in camera*)).

685. These errors and mistakes in Dr. Hill’s model, and the resulting “changes from one iteration of Dr. Hill’s model to the next iteration of his model,” “go directly to the sensitivity of

the model.” (Shehadeh, Tr. 3439-41; Shehadeh, Tr. 3516-17). [REDACTED]

Response to Proposed Finding No. 685

The Proposed Finding is irrelevant and misleading. There is only one set of capacity closure model results, and those are displayed correctly in the April 18 report, which as Respondents clearly know, replaced the April 6 report. (Hill, Tr. 1829 (*in camera*)). Further, the code corrections only strengthened the magnitude of the resulting incentive to withhold output, leaving the substantive conclusions of the model unchanged. (Hill, Tr. 1829 (*in camera*)). While some of the scenarios changed, the overall conclusions remained unchanged because the model results still showed that post-merger, Tronox would have an increased incentive to withhold output. (Hill, Tr. 1829 (*in camera*)). As Dr. Hill testified, { [REDACTED]

[REDACTED] } (Hill, Tr. 1829 (*in camera*)).

E. Dr. Hill’s Cournot Model Suffers from Numerous Fundamental Flaws and Fails Multiple Model Validity Tests.

686. In addition to his capacity closure model, Dr. Hill supports his opinions regarding the likelihood of unilateral competitive effects using a Cournot model. (Hill, Tr. 1957-58; Hill, Tr. 1759). The Cournot model “is a model of competition in homogeneous goods.” (Shehadeh, Tr. 3387).

Response to Proposed Finding No. 686

The Proposed Finding is incomplete, misleading. In addition to the model, Dr. Hill also relied on the qualitative evidence and data to support his opinions in this matter. (CCFF ¶ 658). The qualitative evidence confirmed the results of Dr. Hill’s quantitative work. (CCFF ¶¶ 552-694).

687. Dr. Hill uses the Cournot model “to calculate what is called a compensating marginal cost reduction.” (Shehadeh, Tr. 3387). The question the calculation seeks to answer is “[h]ow much marginal cost reduction would be required to offset the effects in the Cournot

model?” (Shehadeh, Tr. 3387). Dr. Hill “concludes from that model that unrealistically high marginal cost reductions will be required to offset what this model shows, and as a result, he concludes that . . . the proposed transaction would lead to anticompetitive effects, namely, price increases.” (Shehadeh, Tr. 3387).

Response to Proposed Finding No. 687

The Proposed Finding is misleading in its wording. What is unrealistic is that the merger would need to generate marginal cost reductions of more than 70 percent to offset the incentive for Tronox to increase price. (CCFF ¶ 684).

688. 

Response to Proposed Finding No. 688

First, the Proposed Finding is not supported by the cited evidence, as Dr. Hill does not mention any specific model, nor does he say that he does not calculate consumer harm. (Hill, Tr. 2053). Second, the finding is misleading and inaccurate. While the Cournot model focuses on the change in marginal cost that would be required to offset a change in price (PX5000 at 090 ¶ 208) (Hill Initial Report) (*in camera*)), the capacity closure model calculated a direct measure of consumer harm for each scenario. (PX5000 at 088 (Fig. 33) (Hill Initial Report) (*in camera*)). Moreover, the Cournot model did predict a price increase of 8.4%. (CCFF ¶ 691).

689. The “Horizontal Merger Guidelines do not suggest the use of the Cournot model in any analysis.” (Hill, Tr. 1917).

Response to Proposed Finding No. 689

The Proposed Finding is irrelevant and misleading. The Horizontal Merger Guidelines do not cite any economic model by name, but do state that “the Agencies may construct economic models designed to quantify the unilateral price effects resulting from the merger.” (PX9085 at 024 (Horizontal Merger Guidelines)).

a. Dr. Hill’s Cournot Model Is Unreliable and Useless Because It Cannot Pass Even Basic Model Validity Tests.

690. Dr. Shehadeh “conducted three validity tests” for Dr. Hill’s Cournot model “to compare how that model performs” under those tests. (Shehadeh, Tr. 3388). Dr. Hill’s Cournot model “fails all three of those validity tests.” (Shehadeh, Tr. 3388).

Response to Proposed Finding No. 690

The Proposed Finding is misleading, incomplete and contrary to the weight of the evidence. Dr. Shehadeh’s “validity tests” include assertions that the test is biased against mergers (CCFF ¶ 686), misinterpreting which profits firms care about (CCFF ¶ 694), and making unjustified changes to the Cournot model. (CCFF ¶ 691). Dr. Hill addressed all of these concerns and explained why the results of the Cournot model are robust, even in light of Dr. Shehadeh’s criticisms. (CCFF ¶¶ 686-94).

691. Dr. Shehadeh investigated why Dr. Hill’s Cournot model “failed those validity tests” and found that “the failure of [Dr. Hill’s Cournot] model relative to those validity tests arises again because of the constraints that the model imposes on the responses of rivals as well as how the model is inconsistent with real-world operations.” (Shehadeh, Tr. 3388).

Response to Proposed Finding No. 691

The Proposed Finding is misleading. The Cournot model allows for an unlimited range of supply responses from rivals in response to a price change. (CCFF ¶ 687). Indeed, Dr. Hill cited to established textbooks to explain that the only constraint in the Cournot model is that firms try to maximize profits understanding that their rivals have the same goal. (CCFF ¶ 687).

692. Because Dr. Hill’s Cournot model failed these model validity tests, the model “can’t be relied on to predict likely anticompetitive effects in the real world.” (Shehadeh, Tr. 3398). For these reasons, Dr. Hill’s Cournot model “should be set aside.” (Shehadeh, Tr. 3388).

Response to Proposed Finding No. 692

The Proposed Finding is misleading and inaccurate. Dr. Shehadeh erroneously claims the Cournot model fails validity tests by making unjustified claims about the model or imposing inappropriate changes to the model. (CCFF ¶¶ 686-94). As detailed above, Dr. Shehadeh’s

“validity tests” include assertions that the test is biased against mergers (CCFF ¶ 686), misinterpreting which profits firms care about (CCFF ¶ 694), and making unjustified changes to the Cournot model. (CCFF ¶ 691). Dr. Hill addressed all of these concerns and explained why the results of the Cournot model are robust, even in light of Dr. Shehadeh’s criticisms. (CCFF ¶¶ 686-94). Moreover, the Cournot model is a standard and widely accepted framework for analyzing market power in homogeneous good industries. (CCFF ¶ 686).

i. Dr. Hill’s Cournot Model Predicts Anti-Competitive Price Increases for Mergers Involving Unconcentrated Markets.

693. The first model validity test involved evaluating the predictions of Dr. Hill’s Cournot model of anti-competitive price increases for a merger that would involve an “unconcentrated market under the Merger Guidelines.” (Shehadeh, Tr. 3390).

Response to Proposed Finding No. 693

The Proposed Finding is misleading. The Cournot model is a standard and widely accepted framework for analyzing market power in homogeneous good industries. (CCFF ¶ 686). It is a standard and widely accepted oligopoly model. (CCFF ¶ 686).

694. Dr. Hill’s Cournot model fails this basic model validity test because it “predicts a price increase” for a merger involving an “unconcentrated market.” (Shehadeh, Tr. 3394-95). In other words, “Dr. Hill concludes that a price increase would in fact occur even in markets that the FTC . . . Horizontal Merger Guidelines[] would say is a market in which, because it’s unconcentrated, anticompetitive effects are unlikely to occur and then typically require no further inquiry.” (Shehadeh, Tr. 3395).

Response to Proposed Finding No. 694

The Proposed Finding is misleading and incomplete. Dr. Shehadeh provided no concrete example for this criticism, nor did he suggest the magnitude of this purported price increase in an unconcentrated market, making his hypothetical incomplete and not useful. (Shehadeh, Tr. 3394-95). The Cournot model is a standard and widely accepted framework for analyzing market power in homogeneous good industries. (CCFF ¶ 686). It is a standard and widely accepted oligopoly model. (CCFF ¶ 686).

695. The reason Dr. Hill’s Cournot model fails this model validity test is because of the “imposition in the model of limited competitive responses of rivals and customers and as a result the assignment of too much market power relative to the real world.” (Shehadeh, Tr. 3397). “[T]he implication is is that the model is both inconsistent with the guidelines as well as the recognition in economics of real-world competitive constraints because of the way it constrains economic behavior of rivals and of customers.” (Shehadeh, Tr. 3395). For this reason, Dr. Hill’s Cournot model is invalid. (Shehadeh, Tr. 3394-95).

Response to Proposed Finding No. 695

The Proposed Finding is misleading and incomplete. The Cournot model allows for an unlimited range of supply responses from rivals in response to a price change. (CCFF ¶ 687). Dr. Hill cited to established textbooks to explain that the only constraint in Cournot is that firms try to maximize profits understanding that their rivals have the same goal. (CCFF ¶ 687).

ii. Dr. Hill’s Cournot Model Conflicts with Industry Reality Because It Predicts the Merger Would Not Be Profitable.

696. The second model validity test that Dr. Hill’s Cournot model fails is that it predicts that “the merger is unprofitable.” (Shehadeh, Tr. 3390). Specifically, Dr. Hill’s “Cournot model predicts that in the North American chloride titanium dioxide market, the merger will be unprofitable with respect to the variable costs.” (Hill, Tr. 1781-82). This prediction does not “make sense.” (Shehadeh, Tr. 3399). In fact, the merger will be profitable in North America. (Romano, Tr. 2217).

Response to Proposed Finding No. 696

The Proposed Finding is misleading and incomplete. Dr. Hill explains that firms value total profits, not just variable ones, which are measured in the Cournot model. (CCFF ¶ 694). If the merger also provides fixed cost savings for the firm, then it could be profitable in terms of total profits. (CCFF ¶ 694). This is also a common feature of the Cournot model. (PX5004 at 052 (¶ 129) (Hill Rebuttal Report to Shehadeh) (*in camera*)). Even with this feature, the Cournot model is a standard and widely accepted framework for analyzing market power in homogeneous good industries. (CCFF ¶ 686). It is a standard and widely accepted oligopoly model. (CCFF ¶ 686).

697. As a result, Dr. Hill’s Cournot model is “inconsistent with real-world actions, namely, undertaking this transaction.” (Shehadeh, Tr. 3390, 3399-3400; Hill, Tr. 1781-82). The fact that Dr. Hill’s Cournot model “makes predictions that are inconsistent with real-world actions”

means that “it can’t be relied on to predict real-world outcomes.” (Shehadeh, Tr. 3400). Because the model “cannot explain very significant real-world actions, it’s not valuable for predicting the likely competitive effects of the transaction.” (Shehadeh, Tr. 3400).

Response to Proposed Finding No. 697

The Proposed Finding is misleading and incomplete. First, Dr. Shehadeh appears to compare the joint profits of Tronox and Cristal to the combined profits of the stand-alone firms, but this is the wrong comparison. Because Tronox is purchasing Cristal, the deal will be profitable from Tronox’s point of view as long as the joint profits are greater than Tronox’s current expected profit and some discounted factor of the agreed-upon acquisition price for Cristal’s operations. (Shehadeh, Tr. 3390, 3399-3400). Second, Dr. Hill explains that firms value total profits, not just variable ones, which are measured in the Cournot model. (CCFF ¶ 694). If the merger also provides fixed cost savings for the firm, then it could be profitable in terms of total profits. (CCFF ¶ 694).

iii. Dr. Hill’s Cournot Model Suffers from What FTC Economists Have Recognized as a “Glaring Inconsistency.”

698. The third model validity test that Dr. Hill’s Cournot model fails is that it suffers from an inherent “bias built into it” that “inserts too much market power.” (Shehadeh, Tr. 3391). Dr. Hill’s Cournot model “assigns too much market power, relative to what’s in the real world, to suppliers with large shares.” (Shehadeh, Tr. 3390). As a result of this bias, Dr. Hill’s Cournot model “implies that those large suppliers have unrealistically low costs.” (Shehadeh, Tr. 3390).

Response to Proposed Finding No. 698

The Proposed Finding is misleading, vague as to the term “too much market power,” and incomplete. The paper that Dr. Shehadeh cites to actually endorses using the Cournot model for understanding the competitive dynamics in commodity industries. (CCFF ¶ 686). Further, Dr. Hill compares the costs implied by the Cournot model to available accounting data, and finds that they are quite similar. (CCFF ¶¶ 689-90).

699. This bias, or predisposition, of the Cournot model as used by Dr. Hill is inherent to—or “built into”—the Cournot model as used by Dr. Hill. (Shehadeh, Tr. 3391). As a result, this bias of the Cournot model as used by Dr. Hill exists “in any case or instance in which that particular model is used.” (Shehadeh, Tr. 3391).

Response to Proposed Finding No. 699

The Proposed Finding is misleading and incomplete. The paper that Dr. Shehadeh cites to actually endorses using the Cournot model for understanding the competitive dynamics in commodity industries. (CCFF ¶ 686). Moreover, the Cournot model is a standard and widely accepted framework for analyzing market power in homogeneous good industries. (CCFF ¶ 686). It is a standard and widely accepted oligopoly model. (CCFF ¶ 686).

700. This bias in the Cournot model as used by Dr. Hill is “evident” because “you can take a guidelines merger, by which I mean a merger that leads to an unconcentrated market postmerger, and it will still show consistent price effects.” (Shehadeh, Tr. 3391).

Response to Proposed Finding No. 700

The Proposed Finding is misleading and incomplete. Dr. Shehadeh does not provide example to support his contention. Specifically, he does not provide any evidence of the magnitude of the predicted price increase of a merger in an unconcentrated market, which will ultimately determine whether it is reasonable to believe that any particular merger will be anticompetitive. (Shehadeh, Tr. 3394-95; *see also* CCFF ¶ 686).

701. This bias of the Cournot model as used by Dr. Hill is “generally accepted in the field.” (Shehadeh, Tr. 3391). An FTC economics working paper called this bias a “glaring inconsistency between the real world and what the Cournot model predicts in terms of costs.” (Shehadeh, Tr. 3390). The FTC economics working paper proposed corrections to the Cournot model “because it recognized this glaring inconsistency between the model and the way commodity markets work and so proposed some corrections to the model to account for real-world competition.” (Shehadeh, Tr. 3391).

Response to Proposed Finding No. 701

The Proposed Finding is misleading and incomplete. The paper that Dr. Shehadeh cites to actually endorses using the Cournot model for understanding the competitive dynamics in commodity industries. (CCFF ¶ 686). Further, the changes proposed in that paper reflect specific adaptations of the Cournot model to fit idiosyncratic patterns observed in the California gasoline

refinery market and the specific problems that industry posed for a naïve implementation of the Cournot framework. (CCFF ¶ 686). As explained by Dr. Hill, these issues are not present in the North American market for chloride TiO₂. (CCFF ¶ 691). Lastly, Dr. Hill nevertheless applied the same changes and found his model predictions were robust to the modifications. (CCFF ¶ 691).

b. Once Dr. Hill’s Cournot Model Is Corrected Using FTC Methods for Addressing Its “Glaring Inconsistency,” It Predicts No Anti-Competitive Effects of the Transaction.

702. Dr. Shehadeh applied the “extension of the Cournot model developed by three FTC economists and presented in an FTC Bureau of Economics working paper” to Dr. Hill’s Cournot model in this case. (Shehadeh, Tr. 3388-89). Once the FTC economist-developed corrections to Dr. Hill’s Cournot model were applied, the anti-competitive price effects that Dr. Hill’s Cournot model predicts “largely disappear.” (Shehadeh, Tr. 3388-89, 3391). Indeed, Dr. Shehadeh found “no anticompetitive effect even before incorporating efficiencies.” (Shehadeh, Tr. 3403-06).

Response to Proposed Finding No. 702

The Proposed Finding is misleading and incomplete. The application of these changes is inappropriate for the TiO₂ industry, since the changes proposed in the paper that Dr. Shehadeh relies upon to justify his tweaks are specific to the California gasoline refinery market and the specific problems that industry posed for the Cournot framework. (CCFF ¶ 691). Second, Dr. Hill nevertheless applied the same changes and found his model predictions were robust to the modifications. (CCFF ¶ 691). Rather than the ostensible features of the Cournot model that Dr. Shehadeh characterized as problematic, what actually drove the differences in Dr. Shehadeh’s results was that he imposed an 11 percent margin for Tronox, a change that was completely unjustified and unreasonable. (CCFF ¶¶ 692-93; PX5004 at 049-50 (¶¶ 122-25) (Hill Rebuttal Report to Shehadeh) (*in camera*)). Moreover, it is not consistent with the qualitative evidence and real world experiences. (PX5004 at 049-50 (¶¶ 122-25) (Hill Rebuttal Report to Shehadeh) (*in camera*); CCFF ¶ 693).

703. Unlike Dr. Shehadeh, Dr. Hill did not apply these adjustments from the FTC working paper to his Cournot model in this case. (Shehadeh, Tr. 3392).

Response to Proposed Finding No. 703

The Proposed Finding is inaccurate, misleading and contrary to the weight of the evidence. Dr. Hill did apply these adjustments to his Cournot model in his rebuttal report to Dr. Shehadeh, and found that his results were robust, and therefore his conclusions were unchanged. (PX5004 at 047-51 (¶¶ 114-28 & Fig. 22) (Hill Rebuttal Report to Shehadeh) (*in camera*); CCF ¶ 685-94). The finding is also misleading, since applying these adjustments is not appropriate for the TiO₂ industry. (PX5004 at 047-48 (¶ 116-17) (Hill Rebuttal Report to Shehadeh) (*in camera*); CCF ¶¶ 685-94).

c. Dr. Hill's Capacity Closure and Cournot Models Are "Static" Models that Fail to Account for "Dynamic" Competition and Expansion in the TiO₂ Industry.

704. Dr. Hill's capacity closure model and Cournot model are both "static" models. (Shehadeh, Tr. 3408). Because these models are static, they do not account for "dynamic competition" in the TiO₂ industry, and thus "they overstate the likelihood and the magnitude of any anticompetitive effects." (Shehadeh, Tr. 3408).

Response to Proposed Finding No. 704

The Proposed Finding is inaccurate, misleading and contrary to the weight of the evidence. Dr. Hill estimated the likely supply responses by rivals using real-world data. (CCFF ¶ 640-46). He appropriately incorporated these dynamic responses into his model to allow for the competitive landscape to respond to unilateral changes by the merged firms. (CCFF ¶¶ 671-79). Furthermore, Dr. Shehadeh did not show how adopting any particular dynamic modeling framework from the economic literature would lead to different conclusions. (Shehadeh, Tr. 3407-08 (providing no alternative framework or support to rebut Dr. Hill's use of static information for his capacity closure and Cournot models)). Moreover, Dr. Hill relied on voluminous qualitative evidence in addition to the quantitative data and modeling in coming to his conclusion that the merger would

likely lead to unilateral competitive effects. (CCFF ¶¶ 552-694). The qualitative evidence confirmed the results of Dr. Hill's quantitative work. (CCFF ¶¶ 552-694).

IX. THE TRONOX-CRISTAL ACQUISITION DOES NOT INCREASE THE LIKELIHOOD OF COORDINATED EFFECTS IN THE TIO₂ INDUSTRY.

705. The Tronox-Cristal transaction "is unlikely to lead to anticompetitive effects through coordinated interaction and will not increase the likelihood of such coordinated interaction." (Shehadeh, Tr. 3409).

Response to Proposed Finding No. 705

The Proposed Finding is contrary to the weight of the evidence. Complaint Counsel introduced a substantial amount of evidence that the market for chloride TiO₂ in North America is vulnerable to coordination, and that the proposed acquisition would make it more vulnerable. The evidence shows that the North American market for chloride TiO₂ is already vulnerable to coordination, (CCFF ¶¶ 403-99), and the proposed transaction will alter the market in such a way as to make coordination even more likely, (CCFF ¶¶ 500-50). In forming his opinion, Dr. Shehadeh did not consider most of such evidence.

706. The Tronox-Cristal transaction does not increase the likelihood of coordinated effects in the TiO₂ industry because it "decreases transparency in the market and increases the diversity of incentives in the relevant market," which do not suggest an increased likelihood of coordinated interaction among suppliers post-merger. (Shehadeh, Tr. 3409).

Response to Proposed Finding No. 706

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The record evidence clearly demonstrates that the transaction would make the relevant market more transparent, increasing the likelihood of coordinated interaction among suppliers. (CCFF ¶¶ 537-44). In addition, rather than diversifying the incentives faced by suppliers, it increases the symmetry between the two largest and most dominant firms in the market. (CCFF ¶¶ 545-50).

707. The varied incentives and cost structures of suppliers in the TiO₂ industry, as well as the lack of transparency regarding actual pricing and output, render any potential effort to

coordinate pricing pricing or production behavior extremely difficult to conceive, monitor, and enforce. (Stern, Tr. 3793).

Response to Proposed Finding No. 707

The Proposed Finding, based only on Mr. Stern’s conclusions, is factually inaccurate and contrary to the weight of the evidence. The record evidence clearly demonstrates that the North American market for chloride TiO₂ has all the hallmarks associated with coordination. (CCFF ¶¶ 403-99). In particular, the record indicates that the industry is transparent, with suppliers able to observe and respond to the choices of their competitors Mr. Stern did not even consider such evidence regarding transparency, such as PX1021 ({ [REDACTED] }), or communication through earnings calls, or the evidence such as PX1201, { [REDACTED] } [REDACTED] [REDACTED] [REDACTED] [REDACTED] }, or PX2460 (where Cristal’s Randy Weeks { [REDACTED] } [REDACTED] [REDACTED] [REDACTED] } (PX1021 at 002 (*in camera*); PX1201 at 001 (*in camera*); PX2460 at 003 (Cristal North America Weekly Report) (*in camera*); *see also* CCFF ¶¶ 412-13, 423, 479). Therefore, Mr. Stern’s conclusory description of a “lack of transparency” cannot be credited in light of such real world evidence, and his opinion should be entitled to no weight.

708. Diversity of incentives between TiO₂ producers “frustrates the ability of rivals to reach terms of agreement, to monitor terms of agreement and ultimately to enforce the terms of the agreement to punish, which are the requirements for sustaining tacit coordination.” (Shehadeh, Tr. 3410).

Response to Proposed Finding No. 708

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The record evidence clearly demonstrates that North American chloride TiO₂ producers recognize their mutual interdependence. (CCFF ¶¶ 405-32). Moreover, their shared incentive to maintain a favorable supply-demand balance is reflected in their efforts to maintain “discipline” and avoid triggering competitive responses. (CCFF ¶¶ 433-59; *see, e.g.*, PX1305 at 001 (Mouland email) ([REDACTED]
[REDACTED]
[REDACTED] } (in camera); PX7022 (Mouland, Dep. at 70-71) (in camera); PX9003 at 010-11 (Tronox Q1 2016 Earnings Call)) (“a very disciplined approach to production, to managing supply relative to demand, is what has facilitated the recovery in our markets, and we intend to continue to be disciplined about that.”)).

A. The FTC’s “Evidence” Does Not Identify Any Actual History of Coordination Among TiO₂ Producers.

709. [REDACTED]
[REDACTED]

Response to Proposed Finding No. 709

The Proposed Finding is incomplete, factually inaccurate and misleading. Dr. Hill opined that [REDACTED]
[REDACTED] } (CCFF ¶¶ 405-06, 411, 448).

710. [REDACTED]
[REDACTED]

Response to Proposed Finding No. 710

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. While it is true that there is evidence that input costs may have been increasing during this time, Dr. Hill showed that these changes do not explain the dramatic increase in the price of TiO₂ in 2011 and 2012. For example, { [REDACTED] [REDACTED] [REDACTED] } (PX5002 at 011 (Fig. 4) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)). Moreover, Dr. Shehadeh cites no evidence to support his view that [REDACTED] [REDACTED]. This growth rate would be inconsistent with the overall cost growth numbers cited by Mr. Stern and re-examined by Dr. Hill. (PX5002 at 011 (Figure 4) (Hill Rebuttal Report to Stern and Imburgia) (*in camera*)).

Respondents' reference to "independent business decisions" does not mean that such decisions are not also the sort of highly interdependent decisions that demonstrate the market's vulnerability to coordination. Dr. Hill described a wide array of documents that evidence the interdependence. (PX5000 at 092-96 (¶¶ 216-18) (Hill Initial Report) (*in camera*)).

The evidence of interdependence included, Cristal documents from that period refer to pricing "discipline" among TiO₂ producers, and even describe the "Evil Sin" of making efforts to gain share. (CCFF ¶¶ 438-39). It also included the August 2011 observation by Tronox's Mr. Mouland, { [REDACTED] [REDACTED] [REDACTED] }

[REDACTED]

[REDACTED] } (PX1096 at 002 (Tronox Americas weekly report, Sept. 28, 2011) (*in camera*)). This was also the same month where Mr. Mouland told one of his salespeople that { [REDACTED] [REDACTED] } (PX1292 at 001-02 (Email exchange between Mouland and Larson) (*in camera*)). These are all among the ordinary course documents that Dr. Shehadeh did not consider in assessing Dr. Hill’s opinion, or in reaching his purported “real-world” conclusions that there is no evidence of coordination among TiO2 producers.

711. Tronox does not “tacitly or explicitly communicat[e] with competitors about what prices are doing and what we should be setting them at.” (Romano, Tr. 2288).

Response to Proposed Finding No. 711

The Proposed Finding is self-serving, incomplete, misleading and contrary to the weight of the evidence. The record is replete with evidence that North American TiO2 suppliers closely monitor each other’s investor calls and other public announcements. (CCFF ¶¶ 462-74). Moreover, past courts have found significant evidence of prior interdependent behavior or full-fledged price-fixing. (CCCOL ¶ 31).

712. [REDACTED]

Response to Proposed Finding No. 712

The Proposed Finding is misleading insofar as it suggests that the only way that coordination effects may occur is via explicit price-fixing. On the contrary, the relevant question under the Horizontal Merger Guidelines is whether the merger will change the incentives of the merged firm to engage in less aggressive competition, whether by engaging in tacit or explicit

collusion. (PX9085 at 027-28 (Horizontal Merger Guidelines, § 7)). The evidence is clear that the merger increases the likelihood of coordinated conduct in a market already primed for anticompetitive behavior (CCFF ¶¶ 398-550). { [REDACTED]

[REDACTED] }—a key factor that raises competitive concern with additional consolidation. (CCFF ¶¶ 434-36, 451). In fact, for example, Mr. Romano recommend to CEO Tom Casey that { [REDACTED] }
 [REDACTED] }
 (CCFF ¶ 573 (quoting PX1015) (*in camera*)).

713. Tronox is not “aware of any instances where Mr. Casey and the heads of these other companies ever got together to discuss whether they should coordinate output.” (Arndt, Tr. 1415-16).

Response to Proposed Finding No. 713

The Proposed Finding is misleading for the reasons laid out in Response to Proposed Finding No. 712. Further, based on the evidence of statements that Mr. Casey has made in earnings calls, Tronox’s reliance on Mr. Arndt’s testimony is surprising. For example, Mr. Casey in Tronox’s Q3 2015 earnings call, Tronox’s then CEO, Tom Casey stated “And then the question is when will [the prices] turn. We’re addressing that by managing our production, so that inventories get reduced to normal or below normal levels; and when that happens, prices will rise. We--from what we see with Chemours and Huntsman and presumably the others as well, they’re doing the same thing. We see them acting in the same way.” (CCFF ¶ 429 (*quoting* PX9005 at 010 (Tronox Q3 2015 Earnings Call)). Mr. Casey has made similar comments with respect to TiO₂ feedstock: “We think that the second quarter of 2014 was the low point in high-grade feedstock prices, and in fact that prices in this quarter and in the second half of 2014 were higher than in the second quarter of 2014 on average slag prices around the world. That is in part, we

believe again, because we withdrew from the market. I think Rio responded to that by withdrawing from the market, Iluka took synthetic rutile out of the market.” (CCFF ¶ 998 (*quoting* PX9007 at 009 (Tronox 2015 Q1 Earnings Call Transcript))). Tronox’s references in these earnings calls, which Mr. Arndt attends, to other producers “acting in the same way” or to how they “responded to that by withdrawing from the market” are indicators of the interdependent competitive environment in both TiO₂ pigment and feedstock. (CCFF ¶¶ 429, 998).

B. The FTC’s Theory of Coordination Is Inconsistent with Industry Reality.

714. The FTC’s theory of price coordination is inconsistent with industry reality. [REDACTED]

Response to Proposed Finding No. 714

The Proposed Finding is misleading and contrary to the weight of the evidence. For the testimony that is at the heart of this Proposed Finding, Mr. Romano was asked a leading question by Tronox counsel about whether “the information that Tronox does have regarding its competitors’ pricing in the market enable Tronox to coordinate with competitors to raise prices.” His self-serving and unsurprising answer was no. (Romano, Tr. 2266). But that self-serving answer is contradicted in the first instance by PX1021, which Mr. Romano created. (CCFF ¶ 413).

In this presentation that he made to the Tronox Board, Mr. Romano described { [REDACTED]
[REDACTED]
[REDACTED] } (PX1021 at 002 (Romano email to Turgeon) (*in camera*)). Further, { [REDACTED]
[REDACTED]

██████████} (PX1021 at 002 (Romano email to Turgeon) (*in camera*)). TiO₂ price increases over the years have tended to be close in time and similar in amounts. (CCFF ¶ 426; Pschaidt, Tr. 975 (“Usually the TiO₂ manufacturers announce price increases very close to each other,” and “usually the amounts of these increases are very close to each other.”); Arrowood, Tr. 1091-92 (“Usually, when a supplier, TiO₂ supplier, announces a price increase, within a matter of just a few days the other suppliers will also announce a price increase,” typically for “very similar amounts.”)). TiO₂ producers recognize that price increases are more likely to succeed if competitors in general are implementing price increases as well. (PX7043 (Gigou, Dep. at 58-59) (██████████
██████████
██████████})) (*in camera*)).

Further, the Proposed Finding is misleading because it sets out a range of issues that are far outside of core factual considerations set out in the Merger Guidelines for assessing the potential for a merger to make coordination more likely. (PX9085 at 028-30 (Horizontal Merger Guidelines, § 7.2) (“A market typically is more vulnerable to coordinated conduct if each competitive important firm’s competitive initiatives can be promptly and confidently observed by that firm’s rivals.”)). Consistent with this framework, the record evidence establishes that chloride TiO₂ in North America is transparent, (CCFF ¶¶ 460-92), that producers recognize their interdependence, (CCFF ¶¶ 405-32), and that producers make decisions for the purposes of maintaining “discipline” or not triggering competitive responses, (CCFF ¶¶ 433-59).

715. The FTC’s theory of coordinated withholding of output is also inconsistent with the real world. In Mr. Stern’s experience in the chemical and petroleum industries, he has never seen the type of behavior Dr. Hill posits: he has never seen a company idle its capacity so long as its competitor does the same, and then permanently de-idle its capacity if its competitor doesn’t play along. (Stern, Tr. 3801).

Response to Proposed Finding No. 715

The Proposed Finding is misleading and contrary to the weight of the evidence. It cites to testimony by Mr. Stern that in his “experience in the chemical and petroleum industries,” he has “never seen a company idle its capacity its capacity so long as its competitors does the same” but “de-idle capacity if the competitor does not do the same. However, the conduct that he has never seen in the real world is precisely the sort of conduct that for years—through the OPEC cartel—has been a key aspect of the petroleum industry. (*See Prewitt Enters. v. Org. of the Petroleum Exporting Countries*, 2001 U.S. Dist. Lexis 4141, 6 (N.D. Ala. March 21, 2001) (“Based on the evidence before it, the Court finds it beyond dispute that OPEC was created and exists for the express purpose of coordinating, limiting, stabilizing and otherwise controlling crude oil production and export in order to increase its members' revenues. The foregoing remains OPEC’s principal purpose some 40 years after its creation As relevant here, beginning in or about March 1998, and in furtherance of this purpose, OPEC coordinated and began implementation of an agreement to restrict the production and export of crude oil by its members in amounts totaling 3.1 million barrels per day, thus taking those amounts off the world supply.”)). If Mr. Stern is saying, as it appears he is, that did not perceive behavior by OPEC member of restricting production to be a cartel in which members idled capacity, that further weakens any credibility he may have to present any opinion about Dr. Hill’s discussion and modeling of coordination among chloride TiO₂ producers in North America.

Further, it is clear from the record that Dr. Hill does not posit any unique approach to coordination (CCFF ¶ 398). The model commented on by Mr. Stern is presented in an appendix to Dr. Hill’s report as an example of one form that future coordinated conduct could take. (PX5000 at 150 (¶¶ 350-51) (Hill Report) (*in camera*)). Finally, the particular approach to modeling

coordination adopted by Dr. Hill in his example is a “famous example from the economics literature.” (Hill, Tr. 1999).

716. Mr. Stern, who has spent four decades in the field, testified that in all of his experience, he had never seen the type of coordinating behavior predicted by Hill’s model, branding it a “ridiculous theory.” (Stern, Tr. 3801).

Response to Proposed Finding No. 716

The Proposed Finding, based on Mr. Stern sweeping assertion that in four decades “he had never seen” the sort of coordination described in Dr. Hill’s model, lacks credibility. His observation that Dr. Hill’s model seems “ridiculous” may simply reflect his lack of training in economics in general, let alone antitrust economics in particular, as well as his negligible prior experience in TiO₂. (Stern, Tr. 3855-63). There is nothing in the record to suggest otherwise. Further, it does not appear that Mr. Stern has reviewed any of the ordinary course documents that relate to Dr. Hill’s conclusions. If he had reviewed any of such documents, it is entirely reasonable to believe that Dr. Hill’s opinion would seem less ridiculous.

C. Diversity of Incentives Among TiO₂ Producers Frustrates Coordination.

717. The Tronox-Cristal transaction “is unlikely to lead to anticompetitive effects through coordinated interaction and will not increase the likelihood of such coordinated interaction . . . because the proposed transaction decreases transparency in the market and increases the diversity of incentives in the relevant market.” (Shehadeh, Tr. 3409).

Response to Proposed Finding No. 717

The Proposed Finding is misleading for the reasons laid out in Response to Proposed Finding No. 706.

718. Dr. Shehadeh found “diversity of costs, diversity in the sales and distribution footprints of competitors,” “diversity of scale, and ultimately the diversity of competitive outcomes” among TiO₂ producers. (Shehadeh, Tr. 3410). “[T]hat diversity of incentives is relevant in consideration of coordinated competitive effects because a diversity of incentives frustrates the ability of rivals to reach terms of agreement, to monitor terms of agreement and ultimately to enforce the terms of the agreement to punish, which are the requirements for sustaining tacit coordination.” (Shehadeh, Tr. 3410).

Response to Proposed Finding No. 718

The Proposed Finding is misleading and contrary to the weight of the evidence. While there may be some differences across the North American suppliers of TiO₂, those differences are not so profound that the market is not already vulnerable to coordination. (CCFF ¶¶ 403-99). Moreover, as noted in the Response to Proposed Finding No. 714, there is evidence consistent with prior coordination having taken place.

719. Indeed, the existence of “diversity of... incentives” among TiO₂ producers “frustrate[s] coordination” today, and would frustrate coordination “posttransaction.” (Shehadeh, Tr. 3417). In fact, the transaction would *increase* diversity of incentives, making it *less likely* that TiO₂ producers would coordinate post-transaction. (Shehadeh, Tr. 3417-18). Specifically: “When we look at the effects of the transaction, it increases diversity, including by increased vertical integration, which leads to lower costs, including from the reduction of double marginalization through internal supply. It increases diversity by lowering the costs of expansion for the postmerger entity both upstream and downstream. And it increases diversity by increasing the global network of plants and customers over which the postmerger entity will be optimizing its supply and sales.” (Shehadeh, Tr. 3417-18).

Response to Proposed Finding No. 719

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. While there may be some differences across the North American suppliers of TiO₂, those differences are not so profound that the market is not already vulnerable to coordination. (CCFF ¶¶ 403-99). Moreover, the record shows that the parties have not shown how any increase in vertical integration that would result from the transaction would affect their expansion, production, or pricing decisions overall let alone in the North American market. (CCFF ¶¶ 823-1017). The transaction also creates a greater symmetry between Tronox and Chemours, aligning the incentives of the two largest suppliers of chloride TiO₂ to North American customers. (CCFF ¶¶ 391, 545-50).

720. The reason diversity of incentives would frustrate coordination among TiO₂ producers is because “to have tacit coordination,” TiO₂ producers would need to “reach terms of agreement, monitor terms of agreement and then, if they see their rivals not participating, to punish

or enforce the terms of agreement. And both the existing diversity and the diversity that's created by the transaction will frustrate each of those steps.” (Shehadeh, Tr. 3418).

Response to Proposed Finding No. 720

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. The North American TiO₂ market is already transparent, and the merger will only increase that transparency. (CCFF ¶¶ 460-92, 537-44). Moreover, as noted in the Response to Proposed Finding No. 714, there is evidence consistent with prior coordination having taken place, and the weight of the evidence indicates that the merger will make the market more conducive to coordination in the future. (CCFF ¶¶ 500-50).

721. This diversity of incentives among TiO₂ producers “show[s] that the proposed transaction is unlikely to give rise to coordinated effects or unlikely to increase the likelihood of coordinated effects posttransaction.” (Shehadeh, Tr. 3421).

Response to Proposed Finding No. 721

The Proposed Finding is misleading for the reasons laid out in Response to Proposed Finding No. 719.

D. Dr. Hill’s Coordinated Capacity Closure Model Suffers from the Same Flaws and Shortcomings as the Unilateral Version.

722. Dr. Hill’s “coordinated capacity closure” model is designed “to evaluate coordination between Chemours and the postmerger Tronox in his candidate relevant market.” (Shehadeh, Tr. 3410-11).

Response to Proposed Finding No. 722

The Proposed Finding is misleading insofar as it is clear from the record that Dr. Hill does not posit any unique approach to coordination. (CCFF ¶ 398). The model commented on by Dr. Shehadeh is presented in an appendix to Dr. Hill’s report as an example of one form that future coordinated conduct could take place. (PX5000 at 150 (¶¶ 350-51) (Hill Initial Report) (*in camera*)).

723. Dr. Hill’s coordinated capacity closure model is “very similar” to the unilateral capacity closure model in several key respects. (Shehadeh, Tr. 3411). For example, like the unilateral version, Dr. Hill’s coordinated capacity closure model “assumes that rivals in North America cannot respond and do not respond by export repatriation, by increasing imports for those North American producers, or by expanding capacity or production.” (Shehadeh, Tr. 3411). In other words, like the unilateral version, the coordinated capacity closure model “imposes” restrictions on the competitive responses of rivals in his model. (Shehadeh, Tr. 3414-15). In other ways, the coordinated capacity closure model is different from the unilateral capacity closure model. (Shehadeh, Tr. 3411-12). For instance, the coordinated capacity closure model assumes a “tit-for-tat strategy” of coordination, whereby “Chemours responds in kind to a reduction in supply by Tronox.” (Shehadeh, Tr. 3411-12).

Response to Proposed Finding No. 723

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. While Dr. Hill uses his baseline capacity closure model to evaluate how the proposed merger might affect both unilateral and coordinated incentives, it is incorrect to say that he “assumes” an absence of rival responsiveness. Dr. Hill calibrated his model so that both import and export responses to price changes reflected how the market participants had behaved in the past using real-world data. (CCFF ¶ 667).

724. Dr. Hill’s coordinated capacity closure model “does not provide reliable evidence on any increased incentive or likelihood of coordinated competitive effects.” (Shehadeh, Tr. 3409). For example, Dr. Hill’s coordinated capacity closure model predicts that “price will increase by 61 percent in North America . . . relative to the rest of the world,” and yet “even in the face of those very significant price effects,” the model shows no competitive responses of rivals whatsoever. (Shehadeh, Tr. 3414-15). This is because Dr. Hill “imposes . . . assumptions about the responses of rivals that are unrealistic.” (Shehadeh, Tr. 3415). The ultimate effect of the defects in Dr. Hill’s coordinated capacity closure model is that “the price effects that he predicts are unreliable because they are inconsistent with real-world competitive behavior.” (Shehadeh, Tr. 3414-15).

Response to Proposed Finding No. 724

The Proposed Finding is misleading for the reasons laid out in Response to Findings 722 and 723. (See CCRRFF ¶¶ 722-23, above).

a. Dr. Hill’s Coordination Model Fails Basic Model Validity Tests.

725. Dr. Hill’s coordinated capacity closure model fails the same key validity tests as the unilateral capacity closure model. (Shehadeh, Tr. 3412).⁷¹

Response to Proposed Finding No. 725

The Proposed Finding is misleading for the reasons laid out in Response to Findings 617-628. (See CCRRFF ¶¶ 617-28, above).

726. For example, Dr. Hill’s coordinated capacity closure model “predicts behavior that is inconsistent for Tronox and Chemours relative to what we observe in the real world.” (Shehadeh, Tr. 3412-13). When Dr. Hill’s capacity closure model is run “for Chemours using his model and his data, it shows that Chemours’ behavior predicted by the model is inconsistent with the behavior of Chemours as reflected in the” real world, and thus is not “attuned to industry reality.” (Shehadeh, Tr. 3330-31, 3337-38). For these reasons, Dr. Hill’s coordinated capacity closure model is invalid. (Shehadeh, Tr. 3412-13).

Response to Proposed Finding No. 726

The Proposed Finding is misleading for the reasons laid out in Response to Findings 617-628. (See CCRRFF ¶¶ 617-28, above).

b. Dr. Hill’s Coordination Model Is Purely Academic; It Does Not Even Purport to Model How Coordination Might Take Place in Reality.

727. Dr. Hill admitted that his use of the coordinated capacity closure model “was not an intent to prove that coordination was likely.” (Hill, Tr. 1815). Dr. Hill admitted that he is “not predicting through [his] modeling a specific form of coordination that [he] believe[s] will take place” in the real world. (Hill, Tr. 1992). Instead, Dr. Hill admitted that he simply used his coordinated capacity closure model “to estimate the incentive for coordination between Chemours and the merged firm.” (Hill, Tr. 1988). Dr. Hill acknowledged that although his coordinated capacity closure model predicts an “incentive” to coordinate between Tronox and Chemours, this does not mean that’s what would actually “occur in the real world.” (Shehadeh, Tr. 3424-25, 3437).

Response to Proposed Finding No. 727

The Proposed Finding is misleading for the reasons laid out in Response to Proposed Finding No. 715. (See CCRRFF ¶ 715, above).

⁷¹ The failure of multiple model validity tests of Dr. Hill’s capacity closure model is discussed *supra*, at ¶¶ 609-685. These failures are fully incorporated for the coordinated capacity closure model. (Shehadeh, Tr. 3413-16).

c. Dr. Hill's Coordination Model Is Based on Unrealistic Assumptions.

728. Dr. Hill's "capacity closure model for coordination between Chemours and the merged firm are based on assumptions." (Hill 1992).

- a. The first assumption Dr. Hill makes in his modeling is that he assumed coordination between the merged firm and Chemours. (Hill, Tr. 1815).
- b. A second assumption that Dr. Hill makes in his his modeling is "costless adjustment of production by Chemours." (Hill, Tr. 1993).
- c. A third assumption by Dr. Hill is "perfect communications about closure strategies between Chemours and the merged firm." (Hill, Tr. 1994). This assumption of "perfect communication" between the postmerger Tronox and Chemours is an "unsupportable assumption." (Shehadeh, Tr. 3413-14).

Response to Proposed Finding No. 728

The Proposed Finding is misleading insofar as it is not clear that the assumption of perfect communication is "unsupportable" given the degree of transparency that exists among North American suppliers of chloride TiO₂. (CCFF ¶¶ 460-75). Complaint Counsel has no specific response to the specific quotations of Dr. Hill.

729. For coordination to be a viable real-world strategy between TiO₂ producers, "there would have to be communication about exactly how much is being reduced from supply in North America in order to match that under Dr. Hill's strategy. And further, there would have to be perfect communication about what's actually being done in response." (Shehadeh, Tr. 3413). In fact, "neither of those is observable, because [Dr. Hill's] model treats North America as an island in terms of supply and it is not, including because of the significant exports, and so those frustrate the ability to engage in the perfect communication that Dr. Hill's model requires." (Shehadeh, Tr. 3413-14).

Response to Proposed Finding 729

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. As noted in the Response to Proposed Finding No. 728, the record is clear that the market is quite transparent and suppliers track each other's decision making. Moreover, Dr. Shehadeh errs in his conclusion that it is wrong to treat North America as a distinct market as suppliers monitor import quantities (CCFF ¶ 284), imports from firms other than the big five play a small role in the market (CCFF ¶ 382), and exports are not systematically influenced by the local market price (CCFF ¶¶ 652-57).

d. Dr. Hill’s Model Actually Predicts No Incentive to Coordinate.

730. Dr. Hill’s coordinated capacity closure model “does not actually predict coordination of the type that Dr. Hill proposes.” (Shehadeh, Tr. 3412-13). This is because “Chemours in fact does not have the incentive in his model to coordinate.” (Shehadeh, Tr. 3412-13). “Rather, it has the incentive, according to his model, of . . . free riding and not participating in coordination.” (Shehadeh, Tr. 3413).

Response to Proposed Finding No. 730

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. Dr. Hill’s application of the capacity closure model to coordinated effects is just another data point confirming what the presumption and the additional evidence already shows—that the merger makes coordination in the North American chloride TiO₂ market more likely. (CCFF ¶¶ 500-550). Dr. Hill explained in his rebuttal report that the model was framed to test whether coordination between the merged firm and Chemours to reduce output in North America would prove profitable for both firms over the long run, and the model showed that it would. (PX5004 at 053-55 (¶¶ 137-46) (Hill Rebuttal Report to Shehadeh) (*in camera*)). Accordingly, the model corroborated that the merger increases the incentives, and therefore the likelihood, for post-merger coordination.

731. Dr. Hill assumes that Chemours will coordinate with the merged firm and reduce supply, even though his coordinated capacity closure model shows that “the payoff for maintaining supply is higher than the payoff for reducing supply over the course of the model run.” (Hill, Tr. 1998; RX0170.0302-03).

Response to Proposed Finding No. 731

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. Dr. Hill calculated in his rebuttal report that unless Chemours expected to earn an implausibly high return on its operating capital that its long run incentive would be to coordinate with the merged firm rather than “free ride” on its unilateral capacity reductions. (PX5004 at 055 (¶ 146 and fn. 135) (Hill Rebuttal Report to Shehadeh) (*in camera*)).

732. Even though the model shows the payoff for Chemours is higher if it does not coordinate, Dr. Hill argues that coordination between Chemours and the merged firm can pay off

over time. (Hill, Tr. 1998). Dr. Hill bases that possibility for coordination on “a particular game theory strategy” “known as the grim trigger strategy.” (Hill, Tr. 1999).

Response to Proposed Finding No. 732

The Proposed Finding is factually inaccurate in concluding that the payoff to Chemours is higher from not coordinating for the reasons laid out in the Response to Proposed Finding No. 731. (See CCRRFF ¶ 731, above).

733. In this game theory strategy, the merged firm will idle capacity “so long as Chemours idles the equivalent capacity but permanently de-idles its capacity if Chemours doesn’t play along.” (Hill, Tr. 1999). For the grim trigger strategy to work, “the essential point is that Chemours has to realize what Tronox is going to do.” (Hill, Tr. 1999-2000).

Response to Proposed Finding No. 733

Complaint Counsel has no specific response.

734. But Dr. Hill is “not aware of any evidence of Tronox or Cristal ever sending a message to rivals that they intend to implement a grim trigger strategy.” (Hill, Tr. 2000). Dr. Hill admitted that he has “no way to estimate the likelihood that the merged firm in the real world will actually embark on a grim trigger strategy.” (Hill, Tr. 2000).

Response to Proposed Finding No. 734

The Proposed Finding is misleading in that the industry is transparent and prone to coordination based on the reasons and evidence laid out in Responses to Findings 705-721. (See CCRRFF ¶¶ 705-21, above).

e. If Dr. Hill’s Coordinated Capacity Closure Model Allowed Even Slight Competitive Responses of Rivals, It Would Show All Coordination Scenarios to Be Unprofitable.

735. Just like the unilateral capacity closure model, if Dr. Hill allowed for “an expansion of supply by rivals and substitution by customers in North America” of just 24 ktpa in response to the modeled coordination scenario, this “would be sufficient to render the proposed price increases” in Dr. Hill’s coordinated capacity closure model “unprofitable.” (Shehadeh, Tr. 3415-16). In other words, if Dr. Hill’s coordinated capacity closure model “account[ed] for real-world responses of exports,” “account[ed] for real-world responses of imports,” or “account[ed] for real-world expansions of supply that we observe over time,” it would show no anti-competitive effects. (Shehadeh, Tr. 3416).

Response to Proposed Finding No. 735

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence for the same reasons laid out in Response to Proposed Findings 661-669. (*See* CCRRFF ¶¶ 661-69, above).

736. In the real world, a competitive response of at least 24 ktpa is “virtually certain to occur” in response to sustained price increases of “61 percent in his preferred scenario” in North America. (Shehadeh, Tr. 3416).

Response to Proposed Finding No. 736

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence for the same reasons laid out in Response to Proposed Findings 661-669. (*See* CCRRFF ¶¶ 661-69, above).

737. Therefore, “it’s inappropriate to predict likely anticompetitive effects” using either Dr. Hill’s unilateral or coordinated capacity closure models. (Shehadeh, Tr. 3416.)

Response to Proposed Finding No. 737

The Proposed Finding is factually inaccurate and contrary to the weight of the evidence. As described in Response to Proposed Findings 735 and 736 (*see* CCRRFF ¶¶ 735-36, above), the calibrations that Dr. Hill made in his capacity closure model come from the history of supplier decision-making. This history included events such as the price spike of 2011-2012, when prices effectively doubled from their prior and subsequent levels without precipitating dramatic changes in either the share of imports or export responses. (CCFF ¶¶ 640-57).

PROPOSED CONCLUSIONS OF LAW

I. COMPLAINT COUNSEL HAS THE ULTIMATE BURDEN OF PROOF AS TO EACH ELEMENT OF ITS SECTION 7 CLAIM.

738. Complaint Counsel alleges that the merger between Tronox and Cristal violates Section 7 of the Clayton Act, as amended, 15 U.S.C. § 18. (Administrative Complaint, Docket No. 9377, December 5, 2017)).

Response to Proposed Conclusion No. 738

Complaint Counsel has no specific response.

739. Section 7 of the Clayton Act prohibits a corporation from acquiring another where “the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly.” 15 U.S.C. § 18.

Response to Proposed Conclusion No. 739

Complaint Counsel has no specific response.

740. Complaint Counsel also challenges the transaction under Section 5 of the FTC Act, which “declare[s] unlawful” “[u]nfair methods of competition in or affecting commerce.” 15 U.S.C. § 45. “The allegation that the acquisition is a Section 5 violation, as well as a Section 7 violation, does not require an independent analysis.” *In re Polypore Int’l, Inc.*, No. 9327, 2010 WL 9434806, at *164 (FTC Mar. 1) (citation omitted), *adopted as modified* by 2010 WL 5132519 (FTC Dec. 13, 2010).

Response to Proposed Conclusion No. 740

The Proposed Conclusion is incomplete. An acquisition that violates Section 7 of the Clayton Act also violates Section 5 of the FTC Act. *See FTC v. Ind. Fed’n of Dentists*, 476 U.S. 447, 454 (1986). Section 5 of the FTC Act, however, addresses a broader range of activities than Section 7 of the Clayton Act, as it prohibits “[u]nfair methods of competition in or affecting commerce....” 15 U.S.C. § 45(a)(1). (CCCOL ¶ 5).

741. In a case challenging a transaction under the Clayton Act, Complaint Counsel has the “ultimate burden of proving a Section 7 violation.” *United States v. Sungard Data Sys., Inc.*, 172 F. Supp. 2d 172, 180 (D.D.C. 2001). Complaint Counsel has the “the burden on every element of their Section 7 challenge, and a failure of proof in any respect will mean the transaction should not be enjoined.” *FTC v. Arch Coal, Inc.*, 329 F. Supp. 2d 109, 116 (D.D.C. 2004).

Response to Proposed Conclusion No. 741

The Proposed Conclusion is incomplete. Under the established legal framework, Complaint Counsel bears the burden of establishing a *prima facie* case that the merger may substantially lessen competition in a relevant market. If Complaint Counsel shows the proposed “transaction will lead to undue concentration in the market,” it “establish[es] a presumption of anticompetitive effect.” *United States v. Anthem, Inc.*, 855 F.3d 345, 349 (D.C. Cir. 2017) (internal

quotation marks omitted) (citing *United States v. Baker Hughes Inc.*, 908 F.2d 981, 982 (D.C. Cir. 1990)). This presumption establishes a *prima facie* case that the merger is unlawful. *See id.* (CCCOL ¶ 9).

Respondents, then, bear the burden of production to rebut the presumption of anticompetitive effects. “The more compelling the *prima facie* case, the more evidence the defendant must present to rebut it successfully.” *Anthem*, 855 F.3d at 350 (internal quotation marks omitted). (CCCOL ¶ 10). The stronger the *prima facie* case, the more evidence defendants must present to rebut the established presumption. *See FTC v. Sysco Corp.*, 113 F. Supp. 3d 1, 23 (D.D.C. 2015). (CCCOL ¶ 37). Respondents bear the burden of demonstrating that entry or expansion would be “timely, likely, and sufficient in its magnitude, character, and scope to deter or counteract the competitive effects of concern.” *United States v. H&R Block*, 833 F. Supp. 2d 36, 73 (D.D.C. 2011) (quoting *Merger Guidelines* § 9); *see also FTC v. CCC Holdings, Inc.*, 605 F. Supp. 2d 26, 47 (D.D.C. 2009). (CCCOL ¶ 40). Respondents also bear the burden of proving cognizable efficiencies of a character and magnitude sufficient to ensure that the merger is not likely to be anticompetitive in any relevant market. *See H&R Block*, 833 F. Supp. 2d at 89; *Horizontal Merger Guidelines* § 10. (CCCOL ¶ 42).

If Respondents present evidence sufficient to rebut the presumption, then the burden of producing additional evidence of anticompetitive effects shifts back to the government and merges with the ultimate burden of persuasion, which remains with Complaint Counsel at all times. *Anthem*, 855 F.3d at 350. (CCCOL ¶ 11).

A. Complaint Counsel Bears the Burden of Proof and Persuasion of the Relevant Geographic and Product Markets.

742. Analysis of the likely competitive effects of a merger requires determinations of (1) the relevant product market in which to assess the transaction, (2) the geographic market in which to assess the transaction, and (3) the transaction’s probable effect on competition in the relevant product and geographic markets.” *Arch Coal*, 329 F. Supp. 2d at 117.

Response to Proposed Conclusion No. 742

Complaint Counsel has no specific response.

743. First, “Complaint Counsel bears the burden of proving [the] relevant market within which” the transaction is likely to have “anticompetitive effects.” *In re Polypore Int’l*, 2010 WL 9434806, at *165 (citation omitted). The relevant market has two component parts. “First, the ‘relevant product market’ identifies the product and services with which the defendants’ products compete. Second, the ‘relevant geographic market’ identifies the geographic area in which the defendant competes in marketing its products or service.” *Arch Coal*, 329 F. Supp. 2d at 119; *see also FTC v. CCC Holdings Inc.*, 605 F. Supp. 2d 26, 37 (D.D.C. 2009) (same); *In re Polypore Int’l.*, 2010 WL 9434806, at *165.

Response to Proposed Conclusion No. 743

The Proposed Conclusion is misleading. First, in citing the initial decision in *Polypore*, Respondents have modified the quote, which reads in full: “Complaint Counsel bears ‘the burden of proving a relevant market within which anticompetitive effects are likely as a result of the acquisition.’ *In re R.R. Donnelley & Sons*, 1995 FTC LEXIS 450, at *38.” *Polypore*, 2010 WL 9434806, at *165 (Initial Decision) (emphasis added).

Complaint Counsel must identify *a* product with which Respondents compete, and *a* geographic area where Respondents compete, with respect to that relevant product. There can be more than one relevant market, but Complaint Counsel need not prove every one.

744. “Not only is the proper definition of the relevant product market the first step in this case, it is also the key to the ultimate resolution of this type of case, since the scope of the market will necessarily impact any analysis of the anticompetitive effects of the transaction.” *SunGard Data Sys*, 172 F. Supp. 2d at 181. “Determination of the relevant product and geographic markets is ‘a necessary predicate’ to deciding whether a merger contravenes the Clayton Act.” *United States v. Marine Bancorporation, Inc.*, 418 U.S. 602, 618 (1974) (citations omitted).

Response to Proposed Conclusion No. 744

The Proposed Conclusion is unclear because the quoted language from *SunGard* does not indicate what “type of case” the court was referring to. In *SunGard*, for example, the relevant

product market was in dispute, but it was “undisputed that the relevant geographic market [was] North America.” 172 F. Supp. 2d at 181 n.9.

745. Complaint Counsel “bears the burden of proof and persuasion in defining the relevant market.” *Arch Coal*, 329 F. Supp. 2d at 119 (citing *SunGard Data Sys.*, 172 F. Supp. 2d at 182-83). Complaint Counsel’s case fails if it cannot define a relevant market. *FTC v. Lab. Corp. of Am.*, No. SACV 10-1873 AG (MLGx), 2011 WL 3100372, at *17 (C.D. Cal. Feb. 22, 2011) (“The failure to properly define a relevant market may lead to the dismissal of a Section 7 claim); *FTC v. Cardinal Health, Inc.*, 12 F. Supp. 2d 34, 45 (D.D.C.1998) (“Defining the relevant market is critical in an antitrust case because the legality of the proposed merger[] in question almost always depends upon the market power of the parties involved); *Bathke v. Casey’s Gen. Stores, Inc.*, 64 F.3d 340, 345 (8th Cir. 1995) (“Antitrust claims often rise or fall on the definition of the relevant market).

Response to Proposed Conclusion No. 745

The Proposed Conclusion is not supported by the legal citations, in part. None of the cited cases stands for the proposition that “Complaint Counsel’s case fails if it cannot define a relevant market.” Instead, the cited cases acknowledge the importance of defining a relevant market in an antitrust action. Additionally, *Bathke v. Casey’s General Stores, Inc.* is not a merger case at all, but rather is a decision in a class action lawsuit involving predatory pricing claims. 64 F.3d 340, 343 (8th Cir. 1995).

B. Complaint Counsel Bears the Burden of Proving Anti-Competitive Effects of the Transaction.

746. After proving its product and geographic market, Complaint Counsel must prove the effect of the transaction “may be substantially to lessen competition, or to tend to create a monopoly.” *In re Polypore Int’l*, 2010 WL 9434806, at *165 (citation omitted). To meet this burden, Complaint Counsel cannot simply demonstrate the “mere possibility” of harm. *United States v. AT&T Inc.*, 310 F. Supp. 3d 161, 189-90 (D.D.C. 2018) (citation omitted). Instead, Complaint Counsel must “demonstrate that the substantial lessening of competition will be ‘sufficiently probable and imminent’ to warrant relief.” *Arch Coal*, 329 F. Supp. 2d at 115 (quoting *Marine Bancorporation*, 418 U.S. at 623 n.22).

Response to Proposed Conclusion No. 746

The Proposed Conclusion is incomplete. Section 7 prohibits mergers “‘when a ‘tendency’ toward monopoly or a ‘reasonable likelihood’ of a substantial lessening of competition in the

relevant market is shown” *Marine Bancorporation*, 418 U.S. 602, 622 (1974) (citation omitted). Moreover, *United States v. AT&T* is currently under appeal to the U.S. Court of Appeals for the D.C. Circuit.

Further, for the government to prevail in a Section 7 case, “certainty, even a high probability, need not be shown,” and any “doubts are to be resolved *against* the transaction.” *FTC v. Elders Grain, Inc.*, 868 F.2d 901, 906 (7th Cir. 1989) (emphasis added) (citing *Phila. Nat’l Bank*, 374 U.S. at 362–63); *see also Brown Shoe Co. v. United States*, 370 U.S. 294, 323 (1962). “Congress used the words ‘*may* be substantially to lessen competition’ . . . to indicate that its concern was with probabilities, not certainties.” *FTC v. H.J. Heinz Co.*, 246 F.3d 708, 713 (D.D.C. 2001) (citing *Brown Shoe*, 370 U.S. at 323); *see Horizontal Merger Guidelines*, §1.0 (“Given this inherent need for a prediction, these Guidelines reflect the congressional intent that merger enforcement should interdict competitive problems in their incipiency and that certainty about anticompetitive effect is seldom possible and not required for a merger to be illegal.”).

747. Courts commonly employ a three-step burden-shifting framework for determining whether the effect of the transaction “may be substantially to lessen competition, or to tend to create a monopoly.” *FTC v. H.J. Heinz Co.*, 246 F.3d 708, 714 (D.C. Cir. 2001) (quoting Section 7 of the Clayton Act, 15 U.S.C. § 18). First, Complaint Counsel must establish a *prima facie* case by showing that the transaction would “produce a firm controlling an undue percentage share of the relevant market, and would result in a significant increase in the concentration of firms in that market.” *Id.* (alterations and citation omitted).

Response to Proposed Conclusion No. 747

The Proposed Conclusion is misleading. As the Commission has explained, the traditional burden-shifting framework is not the only way to establish that a merger is anticompetitive, because “the legal framework for analyzing a Section 7 claim is and should be a flexible tool that enables the factfinder to credibly and efficiently organize evidence in a manner that sheds light on

the likely competitive effects of a merger.” *In re Polypore Int’l, Inc.*, 150 FTC 586, *10 (2010), *aff’d sub nom., Polypore Int’l, Inc. v. FTC*, 686 F.3d 1208 (11th Cir. 2012).

748. If Complaint Counsel can establish a *prima facie* case, the burden shifts to Respondents to “show that the market-share statistics give an inaccurate prediction of the proposed acquisition’s probable effect on competition.” *FTC v. Staples, Inc.*, 970 F. Supp. 1066, 1083 (D.D.C. 1997). “Respondents are not required to ‘clearly’ disprove future anticompetitive effects, because such a requirement would impermissibly shift the ultimate burden of persuasion.” *In re Chicago Bridge & Iron Co.*, 138 F.T.C. 1024, 1339-40 (2004) (quoting *United States v. Baker Hughes Inc.*, 908 F.2d 981, 991 (D.C. Cir. 1990)). Respondents may rely on a variety of factors to rebut Complaint Counsel’s *prima facie* case, including “a showing of sufficient efficiencies” resulting from the transaction, *United States v. H&R Block, Inc.*, 833 F. Supp. 2d 36, 89 (D.D.C. 2011), or “the trend of the market either toward or away from concentration, [and] the continuation of active price competition.” *In re Chicago Bridge & Iron*, 138 F.T.C. at 1340.

Response to Proposed Conclusion No. 748

The Proposed Conclusion is incomplete with respect to Respondent’s burden in demonstrating efficiencies. (CCCOL ¶¶ 42-43, 45-47). Under Respondents’ own cited authority, *H&R Block*, with the high concentration at issue here, they must demonstrate “‘proof of extraordinary efficiencies’” that are merger-specific, independently verifiable, and passed on to customers. 833 F. Supp. 2d at 89, 92.

Further, the Proposed Conclusion is misleading because Respondents choose not to address key aspects of the Section 7 framework that are meaningful to this case. First, they do not address the well-established principle that the stronger the *prima facie* case, the more evidence defendants must present to rebut the established presumption. *See Sysco*, 113 F. Supp. 3d at 23. Second, they do not address the significance that the history of a market plays in evaluating a merger under Section 7. As the Seventh Circuit explained in *Elders Grain*, “an acquisition which reduces the number of significant sellers in a market already highly concentrated and prone to collusion by reason of its history and circumstances is unlawful *in the absence of special circumstances.*” 868 F.2d at 906 (emphasis added).

749. If Respondents successfully rebut the *prima facie* case of anticompetitive effects, “the burden of producing additional evidence of anticompetitive effect shifts to the government, and merges with the ultimate burden of persuasion, which remains with the government at all times.” *H.J. Heinz*, 246 F.3d at 715 (citation omitted).

Response to Proposed Conclusion No. 749

Complaint Counsel has no specific response.

II. THE MERGER WILL RESULT IN PRO-COMPETITIVE BENEFITS.

750. The court can consider whether a merger allow the merged firm to “be a stronger competitive force in a post-merger market than [the seller] has been or will be if no merger occurs.” *Arch Coal*, 329 F. Supp. 2d at 157. Evidence of efficiencies can be used in two ways: (1) to rebut a plaintiff’s *prima facie* case, *H.J. Heinz*, 246 F.3d at 720; *FTC v. Univ. Health, Inc.*, 938 F.2d 1206, 1222-23 (11th Cir. 1991) (“[A] defendant may rebut the government’s *prima facie* case with evidence showing that the intended merger would create significant efficiencies in the relevant market); *Baker Hughes*, 908 F.2d at 982-83; or (2) to assess the competitive effects of the transaction, *FTC v. Sysco Corp.*, 113 F. Supp. 3d 1, 82 (D.D.C. 2015). “Yet even if evidence of efficiencies alone is insufficient to rebut the government’s *prima facie* case, such evidence may nevertheless be ‘relevant to the competitive effects analysis of the market required to determine whether the proposed transaction will substantially lessen competition).’ *Arch Coal*, 329 F. Supp. 2d. at 151.

Response to Proposed Conclusion No. 750

The Proposed Conclusion should be rejected as misleading and inaccurate. First, Respondents’ citation to *Arch Coal* at 157 is misleading, as the court in that case was addressing, and rejecting, the defendants’ failing firm defense. *Arch Coal*, 329 F. Supp. 2d at 153-57. The section of the opinion quoted was addressing whether the acquired company’s weakness undercut the probative value of its market shares, not whether that competitor would improve as a competitor. *Id.* at 153. Of course, no one has alleged that Cristal is a weak competitor in North America.

Second, *Heinz* did not explicitly recognize that efficiencies can be used to rebut a *prima facie* case, but instead recognized that the Supreme Court has not sanctioned such a defense and noted that the issue is “not a closed book.” *Heinz*, 246 F.3d at 720 n.18. Respondents’ citation to *University Health* is similarly misleading, as the Eleventh Circuit did not make any conclusions as

to the scope of any efficiencies defense, but held that efficiencies could be used only where Respondents have demonstrated 1) that the “economies” of a transaction would, on balance, actually benefit consumers; and 2) “real” economies, not those “based solely on speculative, self-serving assertions. 938 F.2d at 1223. *Baker Hughes* does not recognize an efficiencies defense, nor could it have, because it predates *Heinz. Baker Hughes*, 908 F.2d at 981-82.

751. The Tronox-Cristal transaction will generate significant output-enhancing efficiencies that will create an increase of TiO₂ in the global market. FOF ¶¶ 112-217. And increase in the global supply of TiO₂ will benefit TiO₂ purchasers by decreasing prices and increasing quality. FOF ¶ 100-02, 130.

Response to Proposed Conclusion No. 751

The Proposed Conclusion should be rejected for reasons stated in Complaint Counsel’s corresponding Reply Findings. (CCRRFF ¶¶ 112-17, 100-02, 130). Second, Respondents’ cited Proposed Findings do not explain how increasing global supply of TiO₂ will increase quality. Additionally, even an increase in the supply of sulfate (including anatase) TiO₂, or TiO₂ elsewhere in the world, are out-of-market efficiencies that should be rejected. *See Horizontal Merger Guidelines* § 10 n.14.; *see also Phila. Nat’l Bank*, 374 U.S. at 370 (indicating that “anticompetitive effects in one market” could not be justified by “procompetitive consequences in another”); *Anthem, Inc.*, 855 F.3d at 363-64 (rejecting savings claims that, among other “analytic flaws,” were “unmoored from the actual market at issue”). (CCCOL ¶ 44).

752. Because the transaction will result in the merged firm increasing its output and reducing its costs, this Court concludes that the merger is procompetitive. This Court also finds that Tronox/Cristal “will be a stronger competitive force” than without the merger, making Complaint Counsel’s alleged anticompetitive effects unlikely. *Arch Coal*, 329 F. Supp. 2d at 157. Specifically, the output-enhancing that will result from the transaction is entirely inapposite to Complaint Counsel’s theory that the merged firm would reduce output after the transaction. Therefore, Complaint Counsel has not met its burden of proving a Clayton Act Section 7 violation and this Court will issue an order dismissing the Complaint with prejudice and entering judgment in favor of Respondents.

Response to Proposed Conclusion No. 752

The Proposed Conclusion should be rejected. First, Respondents have made no such showing of increased output and reduced costs. Instead, the record evidence shows that the Proposed Acquisition raises the risk of both coordinated, (CCFF ¶¶ 398-550), and unilateral reductions in output, (CCFF ¶¶ 551-694), and that Respondents have failed to demonstrate their claimed increases in output are verifiable and merger specific. (CCRRFF ¶¶ 100-226). Second, the citation to *Arch Coal* is inapposite, as the court there had concluded that the acquired firm had a “weak competitive status,” and, in any case “evidence of financial or other weakness must genuinely undercut the statistical showing of anticompetitive market concentration.” 329 F. Supp. 2d at 154, 157. “Indeed, ‘[f]inancial weakness, while perhaps relevant in some cases, is probably the weakest ground of all for justifying a merger,’ and ‘certainly cannot be the primary justification’ for permitting one.” *Id.* at 154 (quoting *Kaiser Aluminum & Chemical Corp. v. FTC*, 652 F.2d 1324, 1339, 1341 (7th Cir.1981)).

Even if the Commission were to conclude that transaction would result in the merged firm having a greater *capability* (and capacity) to produce product, the merged firm would still have a greater *incentive*, either in conjunction with its competitors or unilaterally, to withhold product from customers, the effect of which “may be substantially to lessen competition.” 15 U.S.C. § 18. Additionally, even an increase in the supply of sulfate (including anatase) TiO₂, or TiO₂ elsewhere in the world, are out-of-market efficiencies that should be rejected. *See Horizontal Merger Guidelines* § 10 n.14.; *see also Phila. Nat’l Bank*, 374 U.S. at 370 (indicating that “anticompetitive effects in one market” could not be justified by “procompetitive consequences in another”); *Anthem, Inc.*, 855 F.3d at 363-64 (rejecting savings claims that, among other “analytic flaws,” were “unmoored from the actual market at issue”). (CCCOL ¶ 44).

III. COMPLAINT COUNSEL FAILED TO PROVE ITS ALLEGED PRODUCT MARKET.

753. The relevant product market is comprised of “products that have reasonable interchangeability for the purposes for which they are produced—price, use and qualities considered.” *United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377, 404 (1956).

Response to Proposed Conclusion No. 753

The Proposed Conclusion is incomplete. Although courts look to “reasonable interchangeability,” an additional aspect of product market definition is an inquiry into substitutability – the extent to which customers in response to a SSNIP would substitute from one product to another. (CCCOL ¶ 14).

754. “The outer boundaries of a product market are determined by the reasonable interchangeability of use or the cross-elasticity of demand between the product itself and substitutes for it.” *Brown Shoe Co. v. United States*, 370 U.S. 294, 325 (1962). “[A] product market includes all goods that are reasonable substitutes, even though the products themselves are not entirely the same.” *Sysco*, 113 F. Supp. 3d at 25.

Response to Proposed Conclusion No. 754

The Proposed Conclusion fails to acknowledge that the key question is whether customers will substitute among products in response to relative price changes. *Merger Guidelines*, § 4.1.1. Respondents’ citation to *Sysco* is incomplete, and omits the language making this point: stating the question as ‘whether two products can be used for the same purpose, and if so, whether and to what extent purchasers are willing to substitute one for the other’.” *Sysco*, 113 F. Supp. 3d at 25 (citing *FTC v. Staples*, 970 F. Supp. 1066, 1074 (D.D.C. 1997)).

755. “An analytical method often used by courts to define a relevant market is to ask hypothetically whether it would be profitable to have a monopoly over a given set of substitutable products. If so, those products may constitute a relevant market.” *H&R Block*, 833 F. Supp. 2d at 51; see also *United States v. Oracle Corp.*, 331 F. Supp. 2d 1098, 1111-12 (N.D. Cal. 2004); *Arch Coal*, 329 F. Supp. 2d at 119-20; accord PX9085-011-013 (Horizontal Merger Guidelines § 4.1.1). “[C]ourts determine the degree to which price increases will cause marginal buyers to turn to other products.” *Oracle*, 331 F. Supp. 2d at 1118.

Response to Proposed Conclusion No. 755

The Proposed Conclusion is misleading and should be rejected. The citation to *Oracle* at 1118 is specifically discussing how to evaluate unilateral effects claims in a differentiated products market; it does not discuss the application of the hypothetical monopolist test. Nor does the citation discuss a SSNIP or diversion to other channels. Importantly, the citation discusses supply elasticity, which is not an element of market definition. (CCFF ¶ 360). This case does not involve a differentiated product market.

The statement regarding the application of hypothetical monopolist test is too truncated. The proper, and more comprehensive, statement of the hypothetical monopolist test is set forth at CCCOL ¶ 14.

756. A well-defined product market “must correspond to the commercial realities of the industry and be economically significant” and should “recognize competition, where, in fact, competition exists.” *Brown Shoe*, 370 U.S. at 326, 336-37 (footnote omitted) (emphasis added); see also *Cardinal Health*, 12 F. Supp. 2d at 46 (same); *PepsiCo, Inc. v. Coca-Cola Co.*, 114 F. Supp. 2d 243, 249 (S.D.N.Y. 2000) (rejecting PepsiCo’s contention “that a bundle of product (fountain syrup) and services (system distribution) utilized by certain customers comprises a separate market”).

Response to Proposed Conclusion No. 756

The Proposed Conclusion should be rejected. The first quote to *Brown Shoe* on page 336–37 addresses how to define a relevant geographic market, not a product market. As described, in *Brown Shoe*, the outer boundaries of a product market are determined by “the reasonable interchangeability of use or the cross-elasticity of demand between the product itself and substitutes for it.” *Brown Shoe*, 370 U.S. at 325. Additionally, *PepsiCo* is not a merger case, but rather a monopolization and concerted action case under Sections 1 and 2 of the Sherman Act, and did not involve any assessment of product substitution. *PepsiCo, Inc. v. Coca-Cola Co.*, 114 F. Supp. 2d 243, 245 (S.D.N.Y. 2000).

757. Furthermore, a product market cannot be established based on customer testimony and preferences when plaintiffs fail to present a sufficiently representative set of customers.

Oracle, 331 F. Supp. 2d at 1167 (“Drawing generalized conclusions about an extremely heterogeneous customer market based upon testimony from a small sample is not only unreliable, it is nearly impossible.” (citing *Sungard Data Sys.*, 172 F. Supp. 2d at 182-83)). The relevant question is whether customers—specifically, marginal customers—would divert enough of their demand to competitors in other channels that a SSNIP would be unprofitable. *Oracle*, 331 F. Supp. 2d at 1118.

Response to Proposed Conclusion No. 757

The Proposed Conclusion is inaccurate, misleading, and should be rejected. The citations to *Oracle* are to parts of the opinion discussing how to evaluate unilateral effects claims in a differentiated products market, not to market definition or the application of the hypothetical monopolist test. Nor do the citations discuss a SSNIP. And the citation to *Oracle* at 1118 discusses supply elasticity, which is not an element of market definition. (CCFF ¶ 360). Moreover, both *Oracle* and *SunGard* involved claims with heterogeneous, differentiated, markets, and are decidedly not helpful in the relatively homogenous market at issue here. This case does not involve a differentiated product market.

Additionally, Complaint Counsel presented customer testimony accounting for a large percentage of the market for chloride TiO₂ sold to North American customers. Respondents’ insistence on discrediting the testimony of customers on their likely responses to a SSNIP is contrary to the *Merger Guidelines*, which note that “Information from customers about how they would likely respond to a price increase, and the relative attractiveness may be highly relevant, especially when corroborated by other evidence such as historical purchasing patterns and practices.” *Horizontal Merger Guidelines* § 2.2.2. Courts also routinely rely upon customer testimony to gain an understanding of the market. *See e.g., FTC v. Sysco Corp.*, 113 F. Supp. 3d 1, 32 (D.D.C. 2015) (using customer testimony as evidence of the proper product market). Here, the customer testimony is overwhelming that sulfate TiO₂ is not a suitable substitute for chloride TiO₂ in North America. (CCFF ¶¶ 33-40, 46-58, 62-68, 70-72, 75-80, 85-91, 123-33). That

customer testimony on the importance of chloride TiO₂ in North America is well supported by testimony of other market participants, by ordinary course documents, by Tronox's public disclosures, and the economic evidence and historical data. (*See, e.g.*, CCF ¶¶ 123, 236).

758. “[A]ntitrust theory and speculation cannot trump facts, and . . . cases must be resolved on the basis of the record evidence relating to the market and its probable future.” *Arch Coal*, 329 F. Supp. 2d at 116-17. Relying on “formalistic distinctions rather than actual market realities [is] generally disfavored in antitrust law.” *Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451, 466-67, 482 (1992).

Response to Proposed Conclusion No. 758

The Proposed Conclusion is misleading and should be rejected. *Eastman Kodak* is not directly on point, as it involved monopolization and tying claims, not a merger. Moreover, the full quotation states: “Legal presumptions that rest on formalistic distinctions rather than actual market realities are generally disfavored in antitrust law. This Court has preferred to resolve antitrust claims on a case-by-case basis, focusing on the particular facts disclosed by the record. In determining the existence of market power, and specifically the responsiveness of the sales of one product to price changes of the other, this Court has examined closely the economic reality of the market at issue.” *Eastman Kodak Co. v. Image Tech. Servs.*, 504 U.S. 451, 466–67 (1992) (citations and internal quotation marks omitted). The Court continues: “The proper market definition in this case can be determined only after a factual inquiry into the ‘commercial realities’ faced by consumers.” *Id.* at 482 (citing *United States v. Grinnell Corp.*, 384 U.S. 563, 572 (1966)). Complaint Counsel’s approach is fully consistent with *Eastman Kodak*.

The quote from *Arch Coal* should be viewed through the same lens, as the support for that proposition comes directly from *Eastman Kodak*.

In this case, in any event, the market definition and analysis of competitive effects and Respondents’ rebuttal evidence is heavily grounded in real world evidence and market realities,

including ordinary course documents of Respondents, public disclosures, and testimony of customers and competitors.

759. The Complaint alleges a product market consisting only of TiO₂ produced using the chloride process. *See* Administrative Complaint, Docket No. 9377, December 5, 2017. However, the record shows that chloride-process TiO₂ and sulfate-process TiO₂ are reasonably substitutable for the vast majority of end uses. FOF ¶¶ 369-77. About 80% of TiO₂ end products can be made with either the sulfate or chloride processes. FOF ¶ 369. Testimony from Tronox and other TiO₂ producers confirms this. FOF ¶¶ 360-69. [REDACTED]

[REDACTED] Furthermore, the real-world commercial evidence indicates that TiO₂ customers can and do switch between chloride- and sulfate-process TiO₂. FOF ¶¶ 383-393. Because of this, pricing for chloride- and sulfate-process TiO₂ are highly correlated. FOF ¶¶ 419-433.

Response to Proposed Conclusion No. 759

The Proposed Conclusion should be rejected. This is not a conclusion of law at all, but a summary of Respondents' Proposed Findings of Fact, and should be rejected for the same reasons that are set forth in Complaint Counsel's corresponding Reply Findings of Fact. *See* CCRRFF ¶¶ 369-77 (discussing the array of reasons that Respondents proposed findings relating to substitutability are vague, misleading and incomplete); CCRRFF ¶ 369 (discussing reasons that Bain study, source of the 80%, is dated, unreliable, contrary to the record, and should be given little weight); CCRRFF ¶¶ 360-99 (discussing reasons that Respondents proposed findings are vague, misleading and contrary to the weight of the evidence); CCRRFF ¶ 377 (discussing reasons proposed finding is misleading and incomplete); CCRRFF ¶¶ 383-393 (discussing reasons proposed findings are misleading, mischaracterize the testimony of certain customers, and are contrary to the weight of the evidence, including trial testimony of customers and of Kronos); CCRRFF ¶¶ 419-433 (discussing the reasons that Dr. Shehadeh's purported economic analysis is misleading, incomplete, prone to error, and unreliable, in part because he relies on samples that are far too small, in part because the so-called co-integration analysis is not an effective tool for

The Proposed Conclusion should be rejected, as it is inaccurate and contrary to the law. First, Complaint Counsel did not only offer testimony from only “a small number of TiO₂ customers and purchasers,” but rather offered documents and testimony from customers representing at least half the market and from all the major producers, including Respondents. Further, the evidence that sulfate TiO₂ is not a competitive constraint included the public disclosures of Tronox, evidence that Tronox did not address in the cited Proposed Findings of Fact, or anywhere else in their Proposed Findings of Fact. At trial, Respondents did not call any customers at all, and offered only the self-serving statements of Tronox executives and their hired experts.

Fuller explanations of why these factual assertions are wrong are found in Complaint Counsel’s corresponding Reply Findings of Fact. (CCRRFF ¶¶ 383-395 (discussing reasons why Respondents Proposed Findings are misleading, incomplete and contrary to the weight of the evidence that substitution to sulfate grades is limited, including customer testimony, TiO₂ producer testimony, and Respondents own documents).

761. Therefore, this Court concludes that Complaint Counsel’s alleged market for chloride-process TiO₂ must fail because they have not met their burden of proving that a narrow market for chloride-process TiO₂—which excludes sulfate-process TiO₂—exists. *See Arch Coal*, 329 F. Supp. 2d at 122 (“The burden . . . is squarely on plaintiffs to establish that [the product at issue] is a separate relevant market); *SunGard Data Sys.*, 172 F. Supp. 2d at 182-83; *Oracle*, 331 F. Supp. 2d at 1172.

Response to Proposed Conclusion No. 761

The Proposed Conclusion is contrary to the weight of the evidence and should be rejected. First, although Respondents seemingly cite to *SunGard* to support the general concept of challenging a market definition as too narrow, there are major differences between *SunGard* and this case, including rapid changes in customer requirements, and the difficulty that even the parties had in delineating what the relevant products actually were. Moreover, the Court observed that

over the course of the proceeding, the witnesses substantially changed their perspectives on the substitutability of different products, and their responses were “vague and confused,” making the product market definition even more difficult. *SunGard Data Sys.*, 172 F. Supp. 2d at 182-83. None of those sorts of factors cited by the court were factors in this case. Additionally, the citation to *Oracle* relates to a discussion of competitive effects, not market definition.

762. This Court concludes that the relevant market includes all TiO₂ of the rutile crystal structure, whether manufactured by the chloride process or the sulfate process.

Response to Proposed Conclusion No. 762

The Proposed Conclusion is contrary to the weight of the evidence and should be rejected. The evidence in the record establishes that the sale of chloride TiO₂ is a relevant product market. (CCRRFF ¶¶ 366-451).

IV. COMPLAINT COUNSEL FAILED TO PROVE ITS ALLEGED GEOGRAPHIC MARKET.

763. A properly defined geographic market charts “the region in which the seller operates, and to which the purchaser can practicably turn for supplies.” *Cardinal Health*, 12 F. Supp. 2d at 49 (citation omitted). The “evidence must address where consumers could practicably go, not . . . where they actually go.” *FTC v. Tenet Health Care Corp.*, 186 F.3d 1045, 1052 (8th Cir. 1999); *see also Bathke v. Casey’s Gen. Stores, Inc.*, 64 F.3d 340, 346 (8th Cir. 1995) (articulating the test as the distance “customers will travel in order to avoid doing business at” the entity that has raised prices rather than the distance customers would travel absent a price increase) (citation omitted).

Response to Proposed Conclusion No. 763

The Proposed Conclusion is misleading in part and incomplete. *Bathke* is a predatory pricing case involving gas stations, not a merger case, and the quoted text is actually an example in a treatise, not the court’s articulation of a test for determining a relevant geographic market in a merger case. *Bathke v. Casey’s Gen. Stores, Inc.*, 64 F.3d 340, 346 (8th Cir. 1995). Additionally, this Proposed Conclusion, and Respondents’ other Proposed Conclusions, omit key law from the Supreme Court in *Brown Shoe* and from the Commission’s decision in *Polypore*, including key

portions of *Polypore* that specifically set out the analytical framework based on the *Horizontal Merger Guidelines*: “Where suppliers can set prices based on customer location, and customers cannot avoid targeted price increase through arbitrage, suppliers may be able to exercise market power over customers located in a particular geographic region, even if a price increase to customers located in other geographic regions would be unprofitable.” *Polypore*, 150 FTC at *16 (citing *Horizontal Merger Guidelines* § 4.2.2). (See generally CCCOL ¶¶ 17, 18).

764. Like the relevant product market, courts apply the hypothetical monopolist test to determine whether a geographic market has been properly defined. *Sysco Corp.*, 113 F. Supp. 3d at 33 (quoting U.S. Dep’t of Justice & Fed. Trade Comm’n, *Horizontal Merger Guidelines* § 4.1.1 (2010)). “If buyers would respond to the SSNIP by shifting to products produced *outside* the proposed geographic market, and this shift were sufficient to render the SSNIP unprofitable, then the proposed geographic market would be too narrow.” *Arch Coal*, 329 F. Supp. 2d at 123.

Response to Proposed Conclusion No. 764

The Proposed Conclusion is an incorrect application of the hypothetical monopolist test to the relevant market. *Arch Coal* involved a market based on the location of suppliers rather than based on the location of customers. *Arch Coal*, 329 F. Supp. 2d at 123 (“The geographic market should be delineated as “a region such that a hypothetical monopolist that was the only present or future *producer of the relevant product at locations* in that region . . .”). Indeed, the opinion cites to Section 1.21 of the *1997 Horizontal Merger Guidelines*, which addresses markets based on “the location of each merging firm (or each plant of a multiplant firm)” rather than Section 1.22 of the *1997 Guidelines*, which addresses “geographic markets consisting of particular locations of buyers.” Compare *1997 Horizontal Merger Guidelines* §§ 1.21 (locations of suppliers), 1.22 (locations of customers) with *2010 Horizontal Merger Guidelines* §§ 4.2.1 (locations of suppliers), 4.2.2 (locations of customers).

Complaint Counsel has alleged a price discrimination market based on the location of customers under Section 4.2.2 of the *2010 Horizontal Merger Guidelines* (Section 1.22 under the

1997 Guidelines). Thus, the correct application of the hypothetical monopolist test is not found in *Arch Coal*, but in *Polypore*, which also involved a price discrimination market based on the locations of customers. (See CCCOL ¶¶ 18, 19). To be clear, the evidence in the record establishes that, applying the *Merger Guidelines* framework, the relevant geographic market is North America. (CCCOL ¶¶ 17-21).

765. [REDACTED]

[REDACTED] Complaint Counsel's economist, however, did not analyze whether TiO₂ is a global market, even though he admitted the transaction is a "worldwide merger." FOF ¶ 330. The record shows there is significant international trade of TiO₂. FOF ¶¶ 271-284. In addition, TiO₂ prices rise and fall together across geographic regions. FOF ¶¶ 306-325. There is a substantial amount of evidence that shows marginal customers can and do purchase TiO₂ from other places around the world in response to even small changes in price.

Response to Proposed Conclusion No. 765

It is correct that Complaint Counsel has alleged a geographic market of sales to customers in North America, but this Proposed Conclusion should otherwise be rejected as contrary to the weight of the evidence, not probative, and misleading. Complaint Counsel's responses can be found at the corresponding Reply Findings of Fact. (CCRRFF ¶ 330) (describing why Respondents' proposed finding is misleading and incomplete because it failed to acknowledge that Dr. Hill applied the hypothetical monopolist test as set out in the Horizontal Merger Guidelines); CCRRFF ¶¶ 271-284 (discussing reasons why Respondents proposed findings are vague and misleading, including the fact that Respondents do not acknowledge that their statistics include anatase grades of TiO₂, and are contrary to the weight of the evidence, including customer testimony, TiO₂ producer testimony, and Respondents' own documents, that demonstrate that the appropriate geographic market is North America); CCRRFF ¶¶ 306-325 (describing how Respondents proposed findings are misleading, incomplete and contrary to the record because, among other reasons, there is not a statistically significant co-movement of prices across

geographic regions, because price “co-movement” is not an accepted method of defining a relevant market, nor does it rebut the conclusion of the hypothetical monopolist test, and because there is substantial evidence, including Respondents’ own documents and testimony that there is regional pricing of TiO₂)).

Respondents have cited no evidence that “marginal customers can and do purchase TiO₂ from other places in the world,” have not identified whether these are North American customers, and, in any case, “TiO₂” would include anatase TiO₂, which Respondents concede is not at issue. (CCFF ¶¶ 334-36).

766. Based on the Court’s foregoing findings of fact and the applicable legal standards and principles set forth here, the Court concludes that Complaint Counsel has failed to prove its alleged relevant geographic market. This Court concludes that the relevant geographic market in which to analyze the effects of the merger is worldwide.

Response to Proposed Conclusion No. 766

The Proposed Conclusion should be rejected as contrary to the weight of the evidence and inaccurate. (CCFF ¶¶ 134-322).

V. COMPLAINT COUNSEL HAS FAILED TO SHOW THAT THE MERGED FIRM IS LIKELY TO UNILATERALLY HARM COMPETITION.

A. Market Shares Do Not Predict the Competitive Effects of the Merger

767. “[S]tatistics concerning market share and concentration are ‘not conclusive indicators of anticompetitive effects.’” *Arch Coal*, 329 F. Supp. 2d at 130 (quoting *United States v. Gen. Dynamics Corp.*, 415 U.S. 486, 498 (1974)). Market shares do not “as a matter of logic, necessarily give a proper picture of a company’s future ability to compete.” *Gen. Dynamics.*, 415 U.S. at 501. “Evidence of market concentration simply provides a convenient starting point for a broader inquiry into future competitiveness.” *Baker Hughes*, 908 F.2d at 984. “That the government can establish a prima facie case through evidence on only one factor, market concentration, does not negate the breadth” of the competitive effects analysis. *Id.*

Response to Proposed Conclusion No. 767

The citation to *General Dynamics* is misleading. Immediately after the quoted language, the Court continued: “In most situations, of course, the unstated assumption is that a company that

has maintained a certain share of a market in the recent past will be in a position to do so in the immediate future. Thus, companies that have controlled sufficiently large shares of a concentrated market are barred from merger by s 7, not because of their past acts, but because their past performances imply an ability to continue to dominate with at least equal vigor.” *Gen. Dynamics*, 415 U.S. at 501.

Moreover, under the Section 7 framework, when the government establishes a *prima facie* case, “the defendants must produce evidence that ‘show [s] that the market-share statistics [give] an inaccurate account of the [merger’s] probable effects on competition’ in the relevant market.” *Heinz*, 246 F.3d at 715 (internal citation omitted).

768. “[T]he court must engage in a comprehensive inquiry into the future competitive conditions in a given market.” *AT&T*, 310 F. Supp. 3d at 190 (citations omitted). “[D]etermining the existence or threat of anticompetitive effects has not stopped at a calculation of market shares” and, therefore, “[a] finding of market shares and consideration of [the presumption created by market shares] should not end the court’s inquiry.” *Oracle*, 331 F. Supp. 2d at 1111; *see also Baker Hughes*, 908 F.2d at 992. Courts must also assess the “structure, history and probable future” of the relevant product market. *Gen. Dynamics*, 415 U.S. at 498.

Response to Proposed Conclusion No. 768

The Proposed Conclusion is misleading because the selective quotations from *Oracle* and *Baker Hughes* suggest that Complaint Counsel cannot carry its burden by establishing a presumption that the transaction is anticompetitive. To the contrary, as *Baker Hughes* explains, upon the government’s establishment of a *prima facie* case, Respondents have the burden of producing evidence to rebut the presumption that the transaction is anticompetitive. *Baker Hughes*, 908 F.2d at 982. That includes producing evidence that “‘show[s] that the market-share statistics [give] an inaccurate account of the [merger’s] probable effects on competition’ in the relevant market.” *Heinz*, 246 F.3d at 715 (internal citation omitted). Moreover, *United States v. AT&T* is currently under appeal to the U.S. Court of Appeals for the D.C. Circuit.

Further, to the extent that the Proposed Finding could be interpreted to suggest that the Section 7 violation in this case “stopped at a calculation of market shares,” that suggestion is contradicted by the record. (CCCOL ¶¶ 28-35).

769. Based on these findings, this Court concludes that Complaint Counsel’s calculation of market shares, even if they were the proper shares to calculate for this case, are not indicative of likely anticompetitive effects from the merger. Therefore, a presumption of anticompetitive effects based on market concentration does not satisfy Complaint Counsel’s burden of proof to establish a violation of Clayton Act Section 7.

Response to Proposed Conclusion No. 769

The Proposed Conclusion should be rejected as contrary to the weight of the evidence and inconsistent with the Merger Guidelines. *See* Merger Guidelines § 5.3 (“Mergers resulting in highly concentrated markets that involve an increase in the HHI of more than 200 points will be presumed to be likely to enhance market power. The presumption may be rebutted by persuasive evidence showing that the merger is unlikely to enhance market power.”) Respondents bear the burden of producing evidence to rebut the presumption that the transaction is anticompetitive, *Baker Hughes*, 908 F.2d at 982.

Further, the market share statistics for a North American market for sales of chloride TiO₂ establish that the Proposed Acquisition would result in a post-merger HHI in excess of 3,100 and a post-merger market share of greater than 30%. Therefore, the merger is presumed “likely to enhance market power,” unless “rebutted by persuasive evidence.” *See Heinz*, 246 F.3d at 716-17 (HHI increase of 510 points creates presumption of harm “by a wide margin”). The market shares and HHI levels here are comparable to the levels found to be unlawful by courts. In *FTC v. University Health, Inc.*, 938 F.2d 1206, 1219 (11th Cir. 1991), the court found that the FTC “clearly established a *prima facie* case of anticompetitive effect” when it proved that a merger of two nonprofit hospitals would have reduced the number of competitors from five to four and

resulted in a combined share of about 43 percent, an increase in HHI of over 630, and a post-merger HHI of 3200. *Univ. Health*, 938 F.2d at 1211 n.12, 1219. That far exceeds levels that the Commission has found unlawful. *See Hosp. Corp. of Am. v. FTC*, 807 F. 2d. 1381 (7th Cir. 1986) (upholding Commission decision finding Section 7 violation where two acquisitions reduced number of competitors from 11 to 7, and increased the HHI to 2300); *In re The B.F. Goodrich Co.*, 110 FTC 207, 59-62 (1988) (Opinion of the Commission) (acquisition led to increase in HHI of 200-300 points, to just over 1600 at the highest, and Commission concluded that “the concentration data create a relatively strong presumption of anticompetitive effects”).

B. Complaint Counsel Has Failed to Produce Evidence that the Merger Will Result in Anticompetitive Effects in Its Alleged Relevant Market.

770. “Analysis of the likely competitive effects of a merger requires [a determination] of . . . the transaction's probable effect on competition in the relevant product and geographic markets.” *Arch Coal*, 329 F. Supp. 2dat 117. “[A]ntitrust theory and speculation cannot trump facts, and . . . cases must be resolved on the basis of the record evidence relating to the market and its probable future.” *Id.* at 116-117. Therefore, Complaint Counsel cannot “simply [make] conclusory allegations that . . . the merger will significantly limit competition without any evidence.” *Advocacy Org. for Patients & Providers v. Mercy Health Servs.*, 987 F. Supp. 967, 974 (E.D. Mich. 1997). Rather, they must show “anticompetitive effects . . . that will result from the merger.” *Id.*

Response to Proposed Conclusion No. 770

The citation to *Advocacy Org.* should be rejected, as the quotations are pure dicta and in any event not applicable to this case, as Complaint Counsel has put on significant anticompetitive effects evidence. (CCCOL ¶¶ 28-35) *Advocacy Org.* involved a merger the government had not challenged, but a private plaintiff had sought a last minute restraining order against the transaction. *Advocacy Org.*, 987 F. Supp. at 969. The court expressly rejected the request for a restraining order based on the equitable defense of laches. *Id.* at 970. The remainder of the opinion was offered for the sake of argument only, was not necessary to the resolution of the case, and is

therefore dicta. *Id.* (“Assuming *arguendo* that laches was not appropriate, this court still would not find an injunction warranted here.”).

771. Where competitors in the same market combine businesses, the transaction may have unilateral anticompetitive effects “if the acquiring firm will have the incentive to raise prices . . . independent of competitive responses from other firms.” *H&R Block*, 833 F. Supp. 2d at 81. Anticompetitive effects are also more likely when “the merger would result in the elimination of a particularly aggressive competitor in a highly concentrated market.” *Staples*, 970 F. Supp. at 1083. Complaint Counsel claims that Tronox’s acquisition of Cristal will lead to unilateral output decreases, but in fact, the evidence demonstrates *no* incentive for the combined company to decrease production unilaterally. FOF ¶¶ 730-734.

Response to Proposed Conclusion No. 771

The Proposed Conclusion of law is incomplete, as unilateral anticompetitive effects can result through additional mechanisms, including output suppression. (CCCOL ¶¶ 34, 35). The Proposed Conclusion misstates Complaint Counsel’s allegation on this point, which is that there is an increased likelihood of unilateral output suppression due to the combined firm’s increased incentive and ability to suppress output in the North American market. (CCFF ¶ 551). Respondents’ claims about the evidence are not supported by the cited Proposed Findings, which address the incentives to coordinate, not suppress output unilaterally. And in any event, those Proposed Findings are addressed in Complaint Counsel’s corresponding Reply Findings of Fact. (CCRRFF ¶¶ 592-704 (discussing why Respondents’ criticisms of Dr. Hill are based on assertions that are vague and misleading, and further describing why Dr. Hill’s analysis is consistent with evidence such as Respondents’ ordinary course documents, and other real world evidence that reflects business realities)).

772. “[O]rdinary course-of-business documents, including those generated by the defendants,” can be probative of whether a proposed merger is likely to result in competitive harm. But as with any other piece of documentary evidence, assessing the probative value of defendants’ own documents and statements requires an examination of the context, circumstances, and foundation of the proffered evidence.” *AT&T*, 310 F. Supp. 3d at 204. However, “a trial by slide deck leaves much to be desired!” *Id.* at 208. “[C]areful consideration should be given to the views of individuals whose responsibilities, expertise, and experience relating to the issues in

question provide particular indicia of reliability.” PX9085-007 (Horizontal Merger Guidelines § 2.2.1).

Response to Proposed Conclusion No. 772

The Proposed Conclusion misquotes the *Merger Guidelines*; the actual quote is: “The Agencies give careful consideration to the views of individuals whose responsibilities, expertise, and experience relating to the issues in question provide particular indicia of reliability.” *Horizontal Merger Guidelines* § 2.2.1. The *Merger Guidelines* also note that “Documents describing industry conditions can be informative regarding the operation of the market and how a firm identifies and assesses its rivals, particularly when business decisions are made in reliance on the accuracy of those descriptions.” *Id.* Moreover, *United States v. AT&T* is currently under appeal to the U.S. Court of Appeals for the D.C. Circuit, and thus may be vacated.

773. “It is beyond dispute that, to be probative in a particular case, expert testimony must incorporate assumptions that are ‘reasonable’ in light of the record evidence.” *AT&T*, 310 F. Supp. 3d at 221 (citing *Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 242 (1993) (“When an expert opinion is not supported by sufficient facts to validate it in the eyes of the law, or when indisputable record facts contradict or otherwise render the opinion unreasonable, it cannot support a jury's verdict.”)). An expert’s opinion cannot be relied upon when “facts adduced at trial regarding the real-world operation of [the industry] demonstrated that his testimony ‘rests on assumptions’ that are ‘implausible and inconsistent with record evidence.’” *AT&T*, 310 F. Supp. 3d at 221-22 (dismissing an expert’s model) (quoting *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 594 n.19 (1986)); see also *Brook Grp.*, 509 U.S. at 242; *FTC v. CCC Holdings, Inc.*, 605 F. Supp. 2d 26, 70-72 (D.D.C. 2009) (dismissing an expert’s model because “the data and predictions cannot reasonably be confirmed by the evidence”). “When an expert opinion is not supported by sufficient facts to validate it in the eyes of the law, or when indisputable record facts contradict or otherwise render the opinion unreasonable, it cannot support a jury's verdict.” *Brooke Grp.*, 509 U.S. at 242.

Response to Proposed Conclusion No. 773

The citations to *Brooke Group* are inapposite. *Brooke Group* involved a Robinson-Patman Act claim along with certain conduct claims, and the issue before the Court was, in the face of uncontested facts, could the expert’s opinion, which contradicted those uncontested facts, allow the case to the go to a jury. *Brooke Grp.*, 509 U.S. at 242. Notably, this particular language related

to “primary-line injury under the Robinson-Patman Act.” *Id.* at 243. Moreover, *United States v. AT&T* is currently under appeal to the U.S. Court of Appeals for the D.C. Circuit

Regardless, it is Respondents’ expert that offered opinions contradicted by the factual record, not Complaint Counsel’s. *See FTC v. Tronox, Ltd., No. 18-cv-1622 (D.D.C. Sep. 5, 2018) (Slip. Op. at 34)* (“The Court finds that Dr. Hill’s overall conclusions are more consistent with the business realities of the TiO₂ industry than those proffered by Dr. Shehadeh, even if the Cournot and Capacity Closure models are subject to valid criticisms.”) .

774. Complaint Counsel claims that the merged firm would reduce its output of TiO₂. (Administrative Complaint, Docket No. 9377, December 5, 2017). Evidence shows exactly the opposite—the merged firm plans to increase its production after the transaction. FOF ¶¶ 121-130, 22. Complaint Counsel did not present any credible testimony or data indicating that the merged firm planned to decrease its production of TiO₂ after the transaction. Furthermore, prior instances where Tronox has temporarily reduced its production were not attempts to influence price, but instead due to mechanical issues, regular maintenance, or weak market conditions and unsustainable financial positions. FOF ¶¶ 544-565. Furthermore, the commercial realities of TiO₂ production incentivize producers to run their plants “flat out.” FOF ¶¶ 572-91.

Response to Proposed Conclusion No. 774

The Proposed Conclusion misstates Complaint Counsel’s claim, which is that there is an increased likelihood of unilateral output suppression due to the combined firm’s increased incentive and ability to suppress output in the North American market. (CCFF ¶ 551). The other assertions and conclusions are addressed in Complaint Counsel’s corresponding Reply Findings of Fact. (CCRRFF ¶¶ 121-130 (discussing reasons why proposed findings are vague, incomplete and misleading, including, among other issues, the fact that the asserted increases in output are based largely on self-serving testimony, relate exclusively to the Yanbu plant, have not been verified, and that in multiple instances, the cited testimony is simply referring to the fact that the combined firm would aggregate the capacity of two firms); CCRRFF ¶¶ 544-565 (discussing how

Respondents' proposed findings are vague, misleading and contrary to the weight of the evidence, including Respondents' documents and public disclosures emphasizing the connection between reducing TiO₂ production and supporting higher TiO₂ pricing); CCRRFF ¶¶ 572-591 (discussing how Respondents' proposed findings are vague, incomplete, misleading and contrary to the weight of the evidence, including the real world evidence that Respondents have not consistently operated their TiO₂ plants flat out)).

Respondents' reference to their Proposed Finding 22 does not relate to increased production but instead relates to the purported increased vertical integration. That proposed finding also is highly misleading. (See CCRRFF ¶ 22 (discussing Respondents failure to distinguish between high grade feedstock and sulfate feedstock)).

775. Similarly, Complaint Counsel's economic expert fails to reflect a realistic or accurate portrayal of the dynamics of the TiO₂ industry. FOF ¶¶ 609-704, 722-737. His analysis also contains a number of fundamental mistakes and errors including the inability of his models to accurately reflect the real-world TiO₂ industry. FOF ¶¶ 670-85. This Court concludes that the Complaint Counsel's economic expert's econometric analysis rests on assumptions that "do[] not make sense as a matter of logic and, more importantly, that have not been supported by sufficient real-world evidence." *AT&T*, 310 F. Supp. 3d at 224. Therefore, it "is not supported by sufficient facts to validate it in the eyes of the law" and "cannot support a decision." *Tenet Health Care*, 186 F.3d at 1053 n.13.

Response to Proposed Conclusion No. 775

The Proposed Conclusion is contrary to the weight of the evidence. These factual assertions are addressed in Complaint Counsel's corresponding Reply Findings of Fact. (CCRRFF ¶¶ 609-704, 722-737 (discussing the reasons that Respondents' proposed findings are vague, misleading and incomplete, and emphasizing that Dr. Hill's conclusions were consistent with the qualitative evidence of likely unilateral and coordinated effects); CCRRFF ¶¶ 670-685 (describing why Respondents' characterizations of errors in Dr. Hill's analysis overstates the so-called errors, fails to acknowledge that he notified the Respondents of the errors and addressed them as soon as

he was aware of them, and that the coding errors did not change the economic results relating to incentives of the merged firm)).

In their Proposed Conclusion, in addition, Respondents inappropriately refer to the Proposed Findings 670-685 as providing support for a proposition that Dr. Hill's models, somehow due to the coding errors that he addressed, do not "accurately reflect the real-world TiO₂ industry." However, Dr. Hill fully addressed those errors, and nothing in the cited findings raises questions about whether his model reflects the real world. Indeed, Dr. Hill's evidence is consistent with the real world concerns about the incentives of the combined firm to withhold output, an incentive that Tronox already has operated on as a stand alone producer. (CCRRFF ¶¶ 609-704).

Moreover, it is Respondents' expert that offered opinions contradicted by the factual record, not Complaint Counsel's. *See FTC v. Tronox, Ltd., No. 18-cv-1622 (D.D.C. Sep. 5, 2018) (Slip. Op. at 34)* ("The Court finds that Dr. Hill's overall conclusions are more consistent with the business realities of the TiO₂ industry than those proffered by Dr. Shehadeh, even if the Cournot and Capacity Closure models are subject to valid criticisms.") . Finally, *United States v. AT&T* is currently under appeal to the U.S. Court of Appeals for the D.C. Circuit.

776. Complaint Counsel's failure to present any credible evidence of anticompetitive effects in its alleged relevant market is fatal to their case as to that alleged relevant market. *See Oracle*, 331 F. Supp. 2d at 1172.

Response to Proposed Conclusion No. 776

The Proposed Conclusion is contrary to law and should be rejected. Complaint Counsel may establish a presumption of anticompetitive effects in a relevant market by showing the merger will lead to undue concentration. (CCCOL ¶ 22). This Proposed Conclusion is also inaccurate,

because Complaint Counsel produced substantial evidence of anticompetitive effects. (CCFF ¶¶ 398-727; *see* CCCOL ¶¶ 28-35).

VI. COMPLAINT COUNSEL HAS FAILED TO PROVE THAT THE MERGED ENTITY WILL LIKELY COORDINATE WITH OTHER TIO2 PRODUCERS.

777. The government must “put forward sufficient evidence to show more than a theoretical ‘possibility’ of coordination.” *AT&T*, 310 F. Supp. 3d at 246. Because “Section 7 involves *probabilities*, not certainties or possibilities,” Complaint Counsel must show that it is not only possible, but more likely than not, that the merger will “enabl[e] or encourag[e] post-merger coordinated interaction among firms in the relevant market that harms [consumers].” *Baker Hughes*, 908 F.2d at 984; *FTC v. OSF Healthcare Sys.*, 852 F. Supp. 2d 1069, 1086 (N.D. Ill. 2012); *Oracle*, 331 F. Supp. 2d at 1109 (rejecting government claim where it had not proved that defendants “would likely engage in coordinated interaction”).

Response to Proposed Conclusion No. 777

The citation to *Baker Hughes* is incorrect, as the quoted language does not appear in the opinion.

The language from *OSF Healthcare* does not track the Proposed Conclusion. There, the court explained: “Although ‘the risk that a merger will induce adverse coordinated effects may not be susceptible to quantification or detailed proof,’ such a risk can be evaluated by reviewing market concentration and any history of collusion in the relevant market.” *OSF Healthcare*, 852 F. Supp. 2d at 1086 (quoting *Merger Guidelines* § 7.1). Respondents then bear the burden of “produc[ing] evidence of structural market barriers to collusion specific to this industry that would defeat the ordinary presumption of collusion that attaches to a merger in a highly concentrated market.” *Id.* at 1087 (internal quotation marks omitted); *see also* (CCCOL ¶¶ 29, 32).

The cite to *Oracle* is misleading. Respondents cite only to page 1109 of the decision, which is a brief summary by the Court of its conclusions. However, they fail to refer to the Court’s discussion of the factors which give rise to a concern about coordination, and its additional reference to the fact that the government in that case did not even offer evidence relating to coordination: “Plaintiffs do not contend that any of those conditions are presented in the proposed

merger which must, therefore, be analyzed for unilateral anticompetitive effects.” *Oracle*, 331 F. Supp. 2d at 1109. Since the government did not raise coordination, the Court did not, despite Respondents characterization, “reject” a coordination theory in that case.

Finally, the citation to *United States v. AT&T* is also misleading, because that case involved a vertical merger—not a horizontal merger between competitors like the one at issue here. As courts and commentators have noted, mergers of competitors create a risk of coordinated interaction, where, as here, the market is concentrated and has demonstrated conduciveness to coordination. *See Heinz*, 246 F.3d at 724-25 (“[W]here rivals are few, firms will be able to coordinate their behavior, either by overt collusion or implicit understanding, in order to restrict output and achieve profits above competitive levels.”); *FTC v. Univ. Health, Inc.*, 938 F.2d 1206, 1218 n. 24 (11th Cir. 1991) (high concentration makes it “easier for firms in the market to collude, expressly or tacitly, and thereby force price above or farther above the competitive level”); *FTC v. Elders Grain, Inc.*, 868 F.2d 901, 906 (7th Cir. 1989) (“an acquisition which reduces the number of significant sellers in a market already highly concentrated and prone to collusion by reason of its history and circumstances is unlawful in the absence of special circumstances.”). Moreover, *United States v. AT&T* is currently under appeal to the U.S. Court of Appeals for the D.C. Circuit.

778. Coordination “describes the process, not in itself unlawful, by which firms in a concentrated market might in effect share monopoly power . . . by recognizing their shared economic interests and their interdependence with respect to price and output decisions.” *Brooke Grp.*, 509 U.S. at 227. Where the government asserts that coordinated effects will be likely post-transaction, the government must prove that such effects are probable. *See Baker Hughes*, 908 F.2d at 984; *see also Oracl*, 331 F. Supp. 2d at 1109 (rejecting Section 7 claim where government failed to prove that market participants “would likely engage in coordinated interaction” post-merger).

Response to Proposed Conclusion No. 778

The Proposed Conclusion is incomplete and incorrect. *Brooke Group* describes in part the incentives surrounding coordination, which the Court described as “Tacit collusion, sometimes

called oligopolistic price coordination or conscious parallelism,” 509 U.S. at 227, but the description is non-exhaustive. (CCCOL ¶ 29).

Baker Hughes does not stand for the cited proposition. Indeed, the Court’s only use of the word probable in that case was to affirm the established principle that once the government has established a *prima facie* case based on market share statistics, defendants in a merger case can rebut the case by providing evidence that the market share statistics, standing alone, did not establish a “probable” effect of the acquisition in reducing competition. 908 F. 2d. at 991. In this case, of course, Complaint Counsel has not based its case on market share statistics alone. (CCCOL ¶¶ 28-35).

Further, while citing to a limited number of cases, Respondents have ignored a number of well-established cases. *See Elders Grain*, 868 F.2d 901, 906 (1989) (“An acquisition which reduces the number of significant sellers in a market already highly concentrated and prone to collusion by reason of its history and circumstances is unlawful *in the absence of special circumstances.*” (emphasis added)); (CCCOL ¶ 32). Again, as the D.C. Circuit has explained, Respondents must show “structural barriers,” unique to this industry, that are sufficient to defeat the “ordinary presumption of collusion” that attaches to a merger in a highly concentrated market. *Heinz*, 246 F.3d at 725; (CCCOL ¶ 38). Respondents have not shown such special circumstances or structural barriers.

Finally, the cite to *Oracle* is again wrong, because as the Court described, the government did not attempt to “prove that market participants ‘would likely engage in coordinated interaction’ post-merger.” 331 F. Supp. at 1113.

779. Complaint Counsel advances a theory that “the mechanism of tacit coordination that is most strongly supported by the evidence is a form of output restriction in which the major” TiO₂ producers “would constrain their production so that increases in supply would lag behind increases in demand, thereby creating an upward pressure on price.” *Arch Coal*, 329 F. Supp. 2d

at 131. “What this means is that the FTC must show projected future tacit coordination, which itself may not be illegal, which is speculative and difficult to prove, and for which there are few if any precedents.” *Id.* This “makes [Complaint Counsel’s] burden to establish anticompetitive effects in the post-merger . . . market more difficult.” *Id.* at 132.

Response to Proposed Conclusion No. 779

The Proposed Conclusion is incomplete and contrary to the law. First, Complaint Counsel coordinated effects claims are not limited to tacit coordination. (CCCOL ¶ 29). Second, although it is true the district court in *Arch Coal* had branded coordination via output suppression a speculative, “novel theory,” 329 F. Supp. 2d at 131, the D.C. Circuit expressly rejected this: “the court agrees with the FTC that there is nothing novel about the theory it has advanced in this case.” *FTC v. Arch Coal, Inc.*, No. 04-5291 (D.C. Cir. Aug. 20, 2004) (Order Denying Emergency Motion for Injunction Pending Appeal).

Further, “an acquisition which reduces the number of significant sellers in a market already highly concentrated and prone to collusion by reason of its history and circumstances is unlawful *in the absence of special circumstances.*” *Elders Grain*, 868 F.2d at 906 (emphasis added). (CCCOL ¶ 32). Respondents have shown no such special circumstances. Again, as the D.C. Circuit has explained, Respondents must show “structural barriers,” unique to this industry, that are sufficient to defeat the “ordinary presumption of collusion” that attaches to a merger in a highly concentrated market. *Heinz*, 246 F.3d at 725. (CCCOL ¶ 38).

Finally, the Proposed Conclusion runs contrary to established principles of merger law that make it a priority to prevent the development of a market structure prone to coordination. “Tacit coordination is feared by antitrust policy even more than express collusion, for tacit coordination, even when observed, cannot easily be controlled directly by the antitrust laws. It is a central object of merger policy to obstruct the creation or reinforcement by merger of such oligopolistic market structures in which tacit coordination can occur.” *Heinz*, 246 F.3d at 725 (emphasis added)

(quoting 4 Phillip E. Areeda, Herbert Hovenkamp & John L. Solow, *Antitrust Law* ¶901b2, at 9 (rev. ed. 1998)).

780. “A market is conducive to tacit coordination, then, where producers recognize their ‘shared economic interests and their interdependence with respect to price and output decisions.’” *Arch Coal*, 329 F. Supp. 2d at 131 (quoting *Brooke Group*, 509 U.S. at 227). “Successful coordination requires two factors: (1) reaching terms of coordination that are profitable to the firms involved and (2) an ability to detect and punish deviations that would undermine the coordinated interaction.” *Arch Coal*, 329 F. Supp. 2d at 131. Coordination, at a minimum, “requires harmonizing the incentives of participating firms and mitigating firm uncertainty concerning rival firms, so that they can effectively coordinate their behavior.” *In re B.F. Goodrich Co.*, No. 9159, 1988 WL 1025464, at *65 (FTC Mar. 15, 1988), modified by 1989 WL 1126669 (FTC Apr. 5, 1989). Coordination also requires the ability to successfully enforce the consensus. Firms will not coordinate production or pricing unless they can “retaliate effectively if and when cheating occurs.” *Id.*; see also PX9085-028 (Horizontal Merger Guidelines § 7) (noting the “ability of rival firms to engage in coordinated conduct depends on the strength and predictability of rivals’ responses to a price change or other competitive initiative”).

Response to Proposed Conclusion No. 780

The Proposed Conclusion is incomplete, misleading, and should be rejected. Respondents offer only a limited description of how coordination could occur. Certainly the conduct described, reaching terms of coordination then punishing deviation, is one way that anticompetitive coordinated effects could occur. But coordination also includes a wide range of conduct that is “individually rational . . . but nevertheless emboldens price increases and weakens competitive incentives to reduce prices or offer customers better terms.” *Merger Guidelines* § 7. The *Merger Guidelines* explain how to evaluate a likelihood of coordinated effects. (CCFF ¶¶ 400-01). The evidence, in any event, establishes that relevant market for chloride TiO₂ in North America is already vulnerable to coordination, and that the Proposed Acquisition would make it even more vulnerable. (CCCOL ¶¶ 30-33).

781. In order to assess whether a transaction will increase the risk that producers will engage in coordinated output-constraining behavior, the court will proceed by examining the competitive state of the market today, determining whether coordinated interaction is feasible and, if so, whether there is evidence that actual or tacit coordination has occurred, and then examining the structure and dynamics of the market, the competitive strength of the merging parties, and the

likely roles that their competitors would play in a post-merger market. *Arch Coal*, 329 F. Supp. 2d at 132. This broad analysis “is necessary to determine whether the FTC has carried its burden to persuade the Court that the proposed transactions increase the risk of coordinated interaction that will likely substantially lessen competition.” *Id.*

Response to Proposed Conclusion No. 781

The Proposed Conclusion is incorrect. Although some of the information discussed in the Proposed Conclusion may be relevant to determining whether coordinated effects are likely, the proper test for evaluating a likelihood of coordinated effects is in Section 7 of the *Merger Guidelines*. (CCFF ¶¶ 398-401).

782. Complaint Counsel has failed to produce evidence to make the required showing. Complaint Counsel merely claims that the merged firm might have an incentive coordinate post-merger, but does not even purport to offer any economic modeling predicting the type of coordination that would occur in the real world. FOF ¶¶ 722-727. Complaint Counsel’s modeling suffers from numerous fundamental flaws. FOF ¶¶ 722-737. Complaint Counsel cannot establish that such coordination is probable and likely to occur as a result of the merger.

Response to Proposed Conclusion No. 782

The Proposed Conclusion is contrary to the weight of the evidence and should be rejected for the reasons set forth in Complaint Counsel’s corresponding Reply Findings of Fact. (CCRRFF ¶¶ 722-737 (discussing why Respondents proposed findings are misleading and contrary to the weight of the evidence)). Additionally, Complaint Counsel did not, nor is it required to, offer an economic model of how coordination is likely to occur. Instead, the *Merger Guidelines* explain how to evaluate a likelihood of coordinated effects. (CCFF ¶¶ 400-01). Complaint Counsel followed the *Merger Guidelines* in setting forth evidence that the relevant market for the sale of chloride TiO₂ in North America is vulnerable to coordination, CCFF ¶¶ 398-499, and that the proposed acquisition would make it more vulnerable. (CCFF ¶¶ 500-550). Further, the evidence that industry participants expect anticompetitive effects, such as increased “discipline” in the

industry, is powerful evidence consistent with the concern that the acquisition makes the relevant market more vulnerable to coordination. (CCFF ¶¶ 704-728).

783. To the contrary, the trial record confirms that Tronox/Cristal and other TiO₂ producers would lack both the ability and shared incentive to engage in the anticompetitive coordination scheme the government hypothesizes. TiO₂ suppliers have different incentives and cost structures, which makes coordination extremely difficult and highly unlikely. Each producer's incentives are unique to its particular circumstances, making aligning those incentives through coordination difficult or impossible. FOF ¶¶ 717-721. Although TiO₂ producers sell similar products, their methods and the costs of producing TiO₂ products differ dramatically from producer to producer. Specifically, TiO₂ producers have a diversity of (1) cost positions and (2) scales of operations, such as capacity and production. This wide diversity of incentives among competing producers, both globally and within North America, frustrates the ability of competitors even to reach terms of agreement for a coordinated scheme, much less to monitor performance under or enforce any agreement.

Response to Proposed Conclusion No. 783

The Proposed Conclusion, which cites to no law and little evidence, is both unsupported and contrary to the weight of the evidence. The single citation, to Respondent's Proposed Findings on producers' diversity of incentives, are addressed in Complaint Counsel's corresponding Reply Findings of Fact. (CCRRFF ¶¶ 717-721 (discussing reasons that Respondents' proposed findings are misleading and contrary to the weight of the evidence, including in particular the substantial evidence that the relevant market is vulnerable to coordination)).

Respectfully submitted,

Dated: September 17, 2018

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CERTIFICATE FOR ELECTRONIC FILING

I certify that the electronic copy sent to the Secretary of the Commission is a true and correct copy of the paper original and that I possess a paper original of the signed document that is available for review by the parties and the adjudicator.

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