GERDAU

August 12, 2016

Mr. Ian MacMillan
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4178

Sent via courier

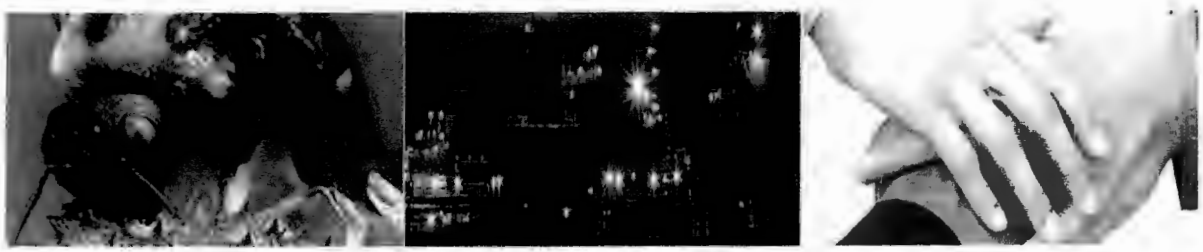
Re: Redacted Risk Reduction Plan

Mr. MacMillan:

Please find attached a redacted version of our Risk Reduction Plan (RRP) originally submitted to the South Coast Air Quality Management District (SCAQMD) on July 1, 2016. It has come to our attention that the RRP plan contains some privileged and confidential information regarding the estimated costs of some of the Risk Reduction Measures proposed. Some of these Risk Reduction Measures entail major construction projects which have yet to be awarded to contractors. We feel this information has the potential to interfere with our bidding and negotiation process with potential contractors. We kindly ask the SCQMD to consider amending our current RRP with the changes incorporated in body of the attached redacted version before it is released to the public domain.

Regards,

Jesse J White
Environmental Manager
Gerdau – Rancho Cucamonga Mill (TAMCO, facility ID# 18931)
12459-B Arrow Route
PO Box 325
Rancho Cucamonga, CA 91739



Risk Reduction Plan
Rule 1402

Prepared for:
Gerdau Long Steel North America TAMCO Steel Mill
Rancho Cucamonga, California

Prepared by:
Ramboll Environ US Corporation

Submittal Date:
July 1, 2016

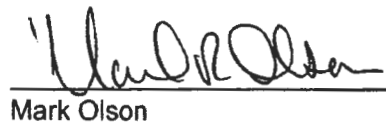
Joseph Hower, PE, DEE
Principal

REGISTERED PROFESSIONAL ENGINEER
JOSEPH W. HOWER
No. 22116
MECHANICAL
STATE OF CALIFORNIA

RAMBOLL ENVIRON

Certification [(f)(3)(I)]

I certify that this Risk Reduction Plan meets the requirements for such plans set forth in South Coast Air Quality Management District Rule 1402(f)(3) and that I am officially responsible for the processes and operations of the Gerdau Longsteel North America TAMCO steel minimill in Rancho Cucamonga, California.



4/4/2016

Mark Olson
Vice-President and General Manager

Date

Contents

Acronyms and Abbreviations

AB:	Assembly Bill
ARB:	(California) Air Resources Board
AER:	Annual Emissions Report
AERMOD:	American Meteorological Society/Environmental Protection Agency regulatory air dispersion model
CEQA:	California Environmental Quality Act
CFD:	Computational Fluid Dynamics
Cr(VI):	Hexavalent chromium
ACFM:	Actual Cubic Feet per Minute
DPM:	Diesel Particulate Matter
DST:	Dustless Sweeping Technology
FDM:	Fluid Dynamic Model
HARP:	Hotspots Analysis and Reporting Program
HEPA:	High-efficiency particulate air
HI:	Hazard Index
HRA:	Health Risk Assessment
MEIR:	Maximally Exposed Individual Resident
MEIW:	Maximally Exposed Individual Worker
NED:	National Elevation Dataset
OEHHA:	Office of Environmental Health Hazard Assessment
PM_{10}:	Particulate Matter less than 10 microns in diameter
PMI:	Point of Maximum Impact
PPM:	Parts Per Million
PTC:	Permit to Construct
REL:	Reference Exposure Level
RRP:	Risk Reduction Plan
RWQCB:	Regional Water Quality Control Board
SCAQMD:	South Coast Air Quality Management District
TAC:	Toxic Air Contaminant
ULPA:	Ultra Low Particulate Air Filters
USEPA:	United States Environmental Protection Agency
USGS:	United States Geological Survey
UTM:	Universal Transverse Mercator
WRAP:	Western Regional Air Partnership

Executive Summary

On January 20, 2015, TAMCO ("Gerdau", SCAQMD Facility ID 018931), wholly-owned subsidiary of Gerdau Longsteel North America, submitted a Health Risk Assessment (HRA) for its steel minimill ("Mill") in Rancho Cucamonga, California. The HRA for 2011 operations was submitted pursuant to the November 20, 2014 letter from Mr. Ian MacMillan, AB2588 Program Supervisor, at the South Coast Air Quality Management District (SCAQMD or "the District") and following the requirements of the Air Toxics "Hot Spots" Information and Assessment Act ([Assembly Bill] AB 2588) and SCAQMD Rule 1402, *Control of Toxic Air Contaminants from Existing Sources*. References to the HRA throughout this report refer to the 2011 HRA as modified by the SCAQMD and described in the October 8, 2015 letter from SCAQMD. The health risk parameters chosen in the HARP2 model are consistent with the SCAQMD Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act ("SCAQMD Supplemental Guidelines") (SCAQMD 2015).

Gerdau submitted the initial Risk Reduction Plan (RRP), pursuant to the HRA approval letter from the SCAQMD, dated October 8, 2015, on April 5, 2016. As summarized in the letter, the modeled residential cancer risk, cancer burden, maximum chronic hazard index (HI), and maximum acute HI exceed the Action Risk Levels set forth in Rule 1402. Gerdau now submits this revised RRP in accordance with Rule 1402(f)(2) requirements, adding the diesel engine powering the crane in the rebar yard, and oral comments received from SCAQMD staff in late June, 2016.

Through the AB2588 HRA process, Gerdau has identified the major risk drivers: 1) Melt Shop fugitives, 2) baghouse, and 3) entrained road dusts. To reduce risks from these sources, Gerdau has made and implemented a number of changes in equipment operations and procedures that have effectively further reduced potential toxic air contaminants (TACs) and associated risks since 2013. Further, Gerdau proposes to implement additional operational changes to further reduce risks from these sources. These risk reduction measures implemented and/or proposed include the following:

Risk Reduction Measure #1: Construction of the new Melt Shop Emissions Control System, including a new pulse jet baghouse;

Risk Reduction Measure #2: Replacement of all diesel light towers with either solar-powered or electric units;

Risk Reduction Measure #3: Replacement of all portable diesel welders and other diesel powered non-mobile source equipment to non-diesel powered units;

Risk Reduction Measure #4: Paving of the Finished Goods Yard;

Risk Reduction Measure #5: Watering on roadways and storage piles;

Risk Reduction Measure #6: Application of chemical dust suppressants on roadways and storage piles;

Risk Reduction Measure #7: Sweeping on all the paved roads and parking lots;

Risk Reduction Measure #8: Cleaning pedestrian pathways;

Risk Reduction Measure #9: Installation of wheel wash station for scrap truck; and

Risk Reduction Measure #10: Relocation of Ladle preheater and new exhaust stacks.

Based on calculation of post-implementation risk discussed in Appendix A, and summarized in Section 6, if the currently proposed (or equivalent) risk reduction measures discussed further in Section 5 are approved by the SCAQMD and implemented by Gerdau, modeled cancer risks at the maximum exposed individual resident (MEIR) will be reduced to 7.2 in a million, modeled cancer risks at the maximum exposed individual worker (MEIW) will be reduced to 0.9 in a million, both of which will be below the SCAQMD Rule 1402 Action Risk Level of 25 in a million and the public notification level of 10 in a million. Additionally, the modeled cancer burden will be reduced to 0.20. The maximum chronic HI and maximum acute HI will be reduced below the SCAQMD public notification thresholds. In summary, Gerdau's future operations and risk profile satisfy Rule 1402 standards, when the measures proposed (or equivalent measures) are implemented.

1 Introduction

On January 20, 2015, Gerdau TAMCO ("Gerdau", SCAQMD Facility ID 018931) submitted a third draft Health Risk Assessment (HRA) for its steel minimill ("Mill") in Rancho Cucamonga, California. The HRA was submitted pursuant to the SCAQMD's November 20, 2014 comment letter in accordance with the Air Toxics "Hot Spots" Information and Assessment Act ([Assembly Bill] AB 2588) and South Coast Air Quality Management District (SCAQMD) Rule 1402, *Control of Toxic Air Contaminants from Existing Sources*. On October 8, 2015, SCAQMD approved the HRA after making the following modifications: (1) expand the receptor grid domain and (2) re-evaluate the risks using the Hotspots Analysis and Reporting Program (HARP2, version 15197) ([Air Resources Board] ARB 2015), which incorporates the new Office of Environmental Health Hazard Assessment (OEHHA) Risk Assessment Guidelines (OEHHA 2015). While the emissions and air dispersion modeling did not change in the modified version of the HRA, modeled cancer risks at residential receptors increased by a factor of about 3.5 as a result of the revised risk assessment methodology, which imposed more stringent assumptions contained in HARP2. Revisions in the risk assessment methodology include, but are not limited to, refinements of the assumptions and methodologies relating to children, and refinements to intake rates for various exposure pathways including inhalation, soil, dermal, and home grown produce. References to the HRA throughout this report refer to the 2011 HRA as detailed in the SCAQMD letter on October 8, 2015. The health risk parameters chosen in the HARP2 model are consistent with the SCAQMD Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act ("SCAQMD Supplemental Guidelines") (SCAQMD 2015).

Gerdau submitted the original Risk Reduction Plan (RRP) on April 5, 2016, pursuant to the HRA approval letter from Mr. Ian MacMillan at SCAQMD, dated October 8, 2015. As summarized in the letter, the modeled residential cancer risk, cancer burden, maximum chronic hazard index (HI), and maximum acute HI exceed the Action Risk Levels set forth in Rule 1402. According to Rule 1402(f)(2), facilities with risks in excess of these Action Risk Levels must submit a RRP within 180 days of HRA approval. Gerdau now submits this revised RRP in accordance with Rule 1402(f)(2) requirements and oral comments received from SCAQMD staff in late June, 2016.

To facilitate the review process, this RRP follows Rule 1402(f)(3) for the contents to be included in such Risk Reduction Plans. The primary components of this plan are as follows:

- A list of potential Facility changes and control measures currently being considered to further reduce emissions,
- A proposed schedule for implementing those measures, and
- A projection of the future expected risk from the Facility after implementation of all these potential (or equivalent) measures.

In compliance with Rule 1402, this RRP presents additional risk reduction measures the Mill is proposing to further reduce emissions, and to ensure that the risk reductions are sustainable. Gerdau reserves the right to amend or modify this RRP depending on the results of future SCAQMD discussions and rulemaking that may impact the Mill.

Existing Conditions

Gerdau has been monitoring lead, manganese, and nickel concentrations at its four onsite monitors close to the fenceline since September 2012.[1] The onsite monitoring data submitted to the SCAQMD on a monthly basis showed a decreasing trend in 2015 compared to the earlier years. The 30-day average concentrations for lead at all monitors are below the US EPA ambient air lead concentration limit of 0.150 $\mu g/m^3$ and for nickel, are below the OEHHA's chronic reference exposure level (REL) of 0.014 $\mu g/m^3$ since January 2015. The recent 30-day average concentrations for manganese are mostly below 0.27 $\mu g/m^3$, equivalent to 3 times the OEHHA's chronic REL of 0.09 $\mu g/m^3$ for Rule 1402 Action Risk Level, at east fenceline monitors (monitors #1 and #4). As required by the recently adopted Rule 1420.2, *Emission Standards for Lead from Metal Melting Facilities*, the sampling is currently conducted on a daily basis. The ambient air lead concentration limit of 0.15 $\mu g/m^3$ will be enforceable commencing 90 days from approval of the Lead Ambient Monitoring and Sampling Plan.

Since 2013, Gerdau has made and implemented a number of changes in equipment operations and procedures that have effectively further reduced potential TACs and associated risks. These changes include the following:

- Completed modification for the ladle heaters and baghouse dust loading system;
- Implemented Melt Shop enclosure practices (e.g., door policy) to minimize fugitive Melt Shop emissions;
- Shutting down the EAF when the on-site weather station indicates northeast winds exceed 15 miles per hour; this will not be necessary once the new baghouse and melt shop modifications are implemented;
- Replaced the diesel light towers with solar or electric operation;
- Paved several previously unpaved areas near the Melt Shop of the Mill;
- Increased roadway sweeping using a particulate matter less than 10 microns in diameter (PM_{10}) efficient sweeper;
- Applied water and chemical dust suppressants to roadways and storage piles; and
- Installed a wheel wash station to prevent scrap trucks from tracking out material when exiting the scrap yard.

In addition, to further control emissions from the EAF and eliminate fugitive emissions from the Melt Shop completely, Gerdau proposes to upgrade the existing Melt Shop evacuation system and baghouse by replacing the existing shaker style baghouse with a 800,000 cfm pulse jet type baghouse system with a stack, with 100,000 cfm available for serving the slag loading operation as needed.

The proposed Gerdau changes discussed in this RRP have been developed based on consultations with the SCAQMD, as well as with Gerdau's contractors, consultants, and

[1] Since September 2012, Gerdau has operated four ambient monitors located adjacent to the Mill, Monitor #1 at SA recycling center, Monitor #2 at south of the baghouse, Monitor #3 at north of office, and Monitor #4 at the east fenceline.

vendors. Gerdau believes that this RRP is responsive to the SCAQMD input and feedback provided thus far. This RRP presents and discusses risk reduction measures currently proposed and provides an assessment of the expected emissions reductions and corresponding risk levels following completion of all measures proposed (or equivalent measures).

The additional risk reduction measures currently proposed and discussed in this RRP are as follows:

- Construction of the new Melt Shop evacuation system with the new pulse jet style baghouse system;
- Replacement of the diesel portable welders and other non-mobile diesel equipment under the SCAQMD Rule 219 with non-diesel powered welders; and
- Paving of the existing unpaved Finished Goods Yard.

2 Facility Identification [(f)(3)(A)]

This Plan is for the following facility:

Gerdau TAMCO Rancho Cucamonga Steel Mini-Mill
12459-B Arrow Route
Rancho Cucamonga, California 91739

SCAQMD Facility ID 018931
SIC Code 312, NAICS Code 331111

3 Risk Characterization [Rule 1402 (f)(3)(B)]

Based on conservative default modeling parameters, Gerdau AB 2588 2011 HRA approved by the SCAQMD indicated the following health risk endpoints as shown in Table 1. The cancer and non-cancer risk results are shown for both risk assessment guidelines in place at the time Gerdau submitted the HRA on January 20, 2015 (using the HARP1 model) (ARB 2012) and per the current guidelines in place, which were used to comply with the SCAQMD letter dated October 8, 2015 (using the HARP2 model) (ARB 2015). The emissions and air dispersion modeling in both 2011 scenarios are identical. These theoretical risks were calculated based on the 2011 emission inventory and include the following emission categories: 1) Electric Arc Furnace (EAF) baghouse, 2) billet reheat furnace, 3) caster spray chamber, 4) entrained road dusts, 5) fugitive dust from material handling, and 6) other fuel combustion sources.

Analysis of the AB2588 HRA results showed that approximately 90 percent of the risks were due to emissions from the Melt Shop fugitives, EAF baghouse, diesel light stands, and entrained road dusts. Upon learning these sources are the major risk contributors, Gerdau evaluated alternative process design or equipment upgrade options to reduce the TAC emissions from both stack and fugitive sources and the associated risks. To this end, Gerdau has taken the following actions to reduce the impacts from several emission sources:

- Completed modification for the ladle heaters and baghouse dust loading system;
- Implemented Melt Shop enclosure practices (e.g., door policy) to minimize fugitive Melt Shop emissions;
- Shutting down the EAF when the on-site weather station indicates northeast winds exceed 15 miles per hour; this will not be necessary once the new baghouse system and melt shop modifications are implemented;
- Replaced the diesel light towers with solar or electric operation;
- Paved several previously unpaved areas of the Mill;
- Increased roadway sweeping using a PM10 efficient sweeper; and
- Applied water and chemical dust suppressants to roadways and storage piles;
- Installed a wheel wash station to prevent scrap trucks from tracking out material when exiting the scrap yard

Because Gerdau AB2588 HRA risk estimates are based on the 2011 throughput, which is one of the lowest production years historically, Ramboll Environ evaluated risks for this RRP assuming operation at Gerdau's permit limit (e.g., maximum allowable throughput of 51,210 tons/month of scrap) to ensure risk mitigation measures in the RRP are effective regardless of any fluctuation of the production rates. Gerdau no longer wishes to exercise the provision in the permit that could allow operation at higher levels (80,000 tons/month of scrap).

As will be discussed in detail below, based on the estimated emissions reductions associated with the proposed or equivalent Risk Reduction Measures discussed in Section 5, Ramboll Environ estimated the facility-wide residual risk that would remain after the implementation of the proposed measures (Post-Implementation HRA) shown in Table 1.

Risk/Hazard Index	2011 HRA (HARP1)	2011 HRA (HARP2)	Post-Implementation HRA (HARP2)
Maximally Exposed Individual Resident cancer risk	15.1 in one million	52.7 in one million	7.2 in one million
Maximally Exposed Individual Resident cancer risk, without the home grown produce pathway	14.9 in one million	41.7 in one million	6.1 in one million
Maximally Exposed Individual Worker cancer risk	24.6 in one million	23.2 in one million	0.9 in one million
Cancer Burden	0.62	3.08	0.20
Maximum Chronic Hazard Index, Resident	0.55	0.53	0.16
Maximum Chronic Hazard Index, Worker	3.48	3.19	0.59
Maximum 8-hour Chronic Hazard Index	--	1.42	0.24
Maximum Acute Hazard Index, PMI	3.04	3.04	0.49

Potential risks at the MEIR are presented both with and without the home grown produce pathway, as that pathway accounts for approximately 16% of the potential cancer risk. The home grown produce pathway assumes that 13.7% of a resident's total fruit and vegetable intake is composed of home grown produce, which is unlikely that households in the urban area surrounding TAMCO have gardens large enough to produce this amount, if they have gardens at all. Therefore the average fraction of a resident's diet from home grown produce is expected to be much lower or zero.

This RRP presents further changes that are proposed for implementation at the Mill, to further reduce risks in accordance with SCAQMD Rule 1402.

4 Sources For Risk Reduction [Rule 1402 (f)(3)(C)]

As discussed above, in anticipation of risk reduction per Rule 1402 requirements, Gerdau has taken actions to reduce emissions and associated risks. Results of the 2011 HRA indicate that the residential cancer risk, the cancer burden, the chronic HI at the MEIW, and the acute HI exceed the SCAQMD Rule 1402 Action Risk Level of 25 in one million for cancer risk, 0.5 for cancer burden, and 3 for HI, respectively. Thus, identification of sources from which risk needs to be reduced, as required in SCAQMD Rule 1402(f)(3)(C), will focus on these risk metrics.

As shown in the Gerdau's 2011 HRA and summarized in the tables below, 94% of the calculated cancer risk at the modeled MEIR is due to emissions from hexavalent chromium [Cr(VI)], dioxins and furans, cadmium and lead from the baghouse and the Melt Shop, and Diesel Particulate Matter (DPM) emissions from the diesel engine exhausts. 93% of the calculated chronic HI at the modeled MEIW is due to manganese and arsenic emissions from the baghouse, the Melt Shop, and the entrained road dusts. 98% of the calculated acute HI is due to nickel emissions from the baghouse, the Melt Shop, and the entrained road dusts. Therefore, the risk reduction focus is on the baghouse and the potential fugitive emissions sources such as the Melt Shop and the entrained road dust. Further control of these potential point source and fugitive emissions will significantly reduce emissions and be sufficient to reduce the associated risk or HI below the Rule 1402 Action Risk Levels.

Table 2: 2011 HRA Risk Breakdown at MEIR, MEIW and PMI Locations

Receptor Location	Health Effect	Total Risk or HI	Major Risk Contributors[1]		
			Chemical	Risk or HI by Chemical	Percentage of total
MEIR	Cancer	52.7	Cr(VI)	26.2	50%
			Dioxins-w/o	7.7	15%
			DPM	6.8	13%
			Cadmium	6	11%
			Lead	3.1	6%
MEIW	Chronic HI	3.19	Manganese	2.56	80%
			Arsenic	0.40	13%
PMI	Acute HI	3.04	Nickel	2.99	98%

[1] Obtained from the AB2588 HRA using 2011 emissions inventory.

5 Evaluation and Specification of Available Risk Reduction Measures and Proposed Schedule [Rule 1402 1402(f)(3)(D), (f)(3)(E), and (f)(3)(F)]

To reduce potential impacts from the major risk contributors: 1) baghouse, 2) Melt Shop fugitives, and 3) entrained road dust emissions at the Mill, Gerdau proposed the risk reduction measures discussed below. Gerdau reserves the right to modify proposed measures discussed herein based on further discussions with SCAQMD and other considerations regarding proposed modifications.

Estimated emissions reductions presented below are approximate and are based on information known to date. Such estimates may be revised as a result of ongoing discussions with SCAQMD staff. This RRP includes any modifications that have been implemented but were not accounted for in the 2011 HRA and the newly proposed changes to be implemented.

The completion dates as provided in the following Risk Reduction Measures are based upon best estimates at this time. Future issues that may arise from permitting and approval from the SCAQMD, local and/or other agencies or delays in procurement of certain equipment may affect proposed schedules presented herein.

Risk Reduction Measure #1: Construction of a new Melt Shop Emissions Control System, which is different from that for which the SCAQMD issued a Permit to Construct (P/C). This is because the risk profile changed with HARP2 in ways that required Gerdau to modify the proposed system. Gerdau discussed the proposed relocation of the baghouse system, originally approved on January 9, 2009 and modified on December 10, 2014 with City of Rancho Cucamonga and the City staff concluded that the relocated project is in compliance with the approved plans and thus no additional entitlement review is needed from the City. The letter from the city dated on February 18, 2016 is included in Attachment 1. In addition, Gerdau met with SCAQMD staff on March 30, 2016, submitted a P/C application on June 7, 2016, and anticipates obtaining a P/C for the revised baghouse project no later than September 2016. The proposed new system will control the emissions associated with the Melt Shop and EAF. The system will replace the existing 700,000 acfm shaker baghouse with a pulse air jet style baghouse with 800,000 cfm airflow rate including 100,000 cfm available for serving the slag loading operation as needed.

The proposed Melt Shop/Baghouse primary system design include the following primary elements:

a. Replace the existing shaker type baghouse with an 800,000 acfm pulse jet baghouse;
b. Connect new ductwork to the existing ductwork and route the air stream to the new baghouse;
c. Install a new spark arrestor located in front of the new baghouse where exhaust gas enters the baghouse inlet manifold and distribute gas to the fabric filter modules to reduce inlet temperature and promote mixing to prevent sparks and large particles from breaking bags;

d. Use of Dustex or equivalent high side inlet design with gas distribution baffling that provides true cross-flow in the baghouse module and maintains a quiescent zone in the hopper, reducing potential dust re-entrainment;

e. Installation of new induced draft fans after the baghouse to direct exhaust into the new 127 foot stack located east of the existing baghouse;

f. 100,000 cfm available for serving the slag loading operation as needed; and

g. New baghouse dust conveying system and rail car load out structure.

Gerdau has implemented an improved Melt Shop enclosure practice (e.g., door policy) to minimize fugitive Melt Shop emissions (see Attachment 2). Gerdau's subcontractor, Bender Corporation (Bender), established a mathematical model of Gerdau's ventilation pattern to estimate the air flow inside the Melt Shop. In addition, Bender evaluated the existing in-draft velocity of the Melt Shop and identify areas of improvements for achieving in-draft velocity greater than 200 feet per minute at any opening of the Melt Shop. As explained in the ventilation study provided in Attachment 3, the new emission control system would increase inward air velocity into the building so proper ventilation inside the Melt Shop is maintained and fugitive emissions from the Melt Shop are eliminated. Based on this analysis, Gerdau will be able to attain in-draft velocities greater than 200 ft per minute after the new emission control system is fully operating as required by SCAQMD Rule 1420.2.

As part of the adoption of Rule 1420.2 Appendix 1, *Requirements for Total Enclosures with Negative Air*, differential pressure monitors will be installed by April 1, 2018 as per the rule's requirements. In order to increase the reliability of the operation of the new system, connections between the pressure monitor to the enclosure of the Melt Shop will be constructed of a hard pipe material (as opposed to flex hose), with the intent of providing better weather resistance and durability. Also, a thermal insulation membrane will be installed between the enclosure of the Melt Shop wall and the pressure monitor to help ensure that the heat from the enclosure does not affect the equipment. Further, the pressure monitor will be installed inside a covered box in order to shield the equipment from the elements (sun, rain, wind). In addition to these extra precautions, one (1) spare calibrated pressure monitor will be kept onsite ready to allow for a timely replacement should any of the pressure monitors fail.

Regarding the control for dioxin and furan emissions, Gerdau has gathered data from the other steel mini-mills and has researched available literature for the best available technology for mitigating dioxins and furans, with the goal of achieving a dioxin and furan exhaust outlet concentrations below 0.1 ng/m^3. Gerdau has been working with Tenova Goodfellow, which used Computational Fluid Dynamics (CFD) modeling of the proposed new geometry of the offgas primary system to optimize post-combustion of gases and spray quenching for cooling. Gerdau plans to replace the spray system of the existing quenching tower. The new spray system will include the following elements:

- Total of 8 nozzles instead of 5 nozzles
- Decrease average water droplet size from 350µm to 50µm
- Increase the maximum water rate capacity from 70 gallons per minute (gpm) to 110 gpm

- Dual fluid nozzles with variable flow

By adjusting the quench time period and generation of the smaller size water droplets for spraying, Gerdau would be able to control the off-gas temperature more efficiently through ramping up the water usage as needed; hence re-formation of dioxins and furans can be minimized. Further details of the modeling analysis are provided in Attachment 4.

Moreover, the Canadian Department of Environment and Climate Change has a regulation for industry of < 0.1 ng/m^3. Canada-Wide Standard for Dioxins and Furans: Steel Manufacturing Electric Arc Furnaces is provided in Attachment 5, and Tenova Goodfellow has worked with Gerdau's Canadian mills in Selkirk, Manitoba, Canada and Whitby, Ontario, Canada to help them achieve less than 0.1 ng/m^3 concentration through implementing additional operational and maintenance procedures, specifically in cleaning of overall system. During February 29 to March 2, 2016, Gerdau staff visited Manitoba mill to learn their operational and maintenance procedures for dioxin and furan mitigation. As documented in the trip report provided in Attachment 6, Gerdau plans to implement similar process and steps at Rancho Cucamonga mill to best control dioxins and furans. Therefore, 0.1 ng/m^3 is used to estimate dioxin and furan emissions in this RRP.

Estimated Emissions Reduction: All Melt Shop fugitive TAC emissions will be captured and routed through the new Melt Shop Evacuation system as described above. Compared to the outlet grain loading of 0.0036 gr/dscf for the existing baghouse based on the Gerdau's source test conducted in September 2014, Gerdau anticipates the new emission control system can meet a grain loading of 0.00047 gr/dscf, which would decrease Cr (VI), lead, and other metals by approximately 85% of the current level. As discussed above, Gerdau is committed to invest in a system that will keep the dioxins and furans concentration below 0.1 ng/m^3. Gerdau will conduct source tests for dioxins and furans (and other TACs) after the system has been commissioned, to verify the emissions performance.

Estimated Cost: Installation cost is estimated at [redacted] annual operational and maintenance costs increase are estimated at [redacted]

Estimated Completion Date: March 2018.

Risk Reduction Measure #2: Replacement of all of the diesel light towers with either solar-powered or electric units. As discussed in Section 4 of this plan, DPM emissions were the third largest risk contributor at the MEIR. Gerdau previously had six portable diesel light towers onsite in 2011; upon learning these engines would increase the cancer risk, Gerdau has switched these diesel engines to solar powered or electric units. A diesel light tower was last used on January 15, 2016. All of the diesel light towers have now been removed from the site.

Estimated Emissions Reduction: Due to the removal of all diesel light towers used onsite, all DPM emissions from these engines are eliminated, which in turn reduced the overall risk associated with DPM emissions.

Estimated Cost: The cost for the solar-powered or electric units is estimated at $33,600 per year (i.e. $2,800 per month or $936 per month for each unit and Gerdau currently uses 3 towers onsite).

Estimated Completion Date: This measure has already been implemented.

Risk Reduction Measure #3: Replacement of portable diesel equipment (e.g., welders) exempt per SCAQMD Rule 219 with non-diesel powered units and thus, reduce DPM emissions and decrease the associated risks. Options for alternative non-diesel engine specifications are provided in Attachment 7.

Estimated Emissions Reduction: Eliminating these onsite diesel equipment will further reduce the DPM emissions, and thus eliminate the cancer risks associated with the DPM from this equipment.

Estimated Cost: Approximately $30,000 capital cost of engines.

Estimated Completion Date: September 2018.

Risk Reduction Measure #4: Paving the Finished Goods Yard to reduce the entrained dust from the traffic movement on the unpaved areas. Gerdau plans to pave a 379,719 square foot finished goods yard located in the northeast side of the Mill as shown on Attachment 8, Area 8.

Estimated Emissions Reduction: Paving the unpaved area would improve the road surface and minimize pulverization of surface material being lifted and dropped from vehicular traffic, and thus, lower the re-entrained dust emissions. Ramboll Environ assumed a control efficiency of 99% for paving based on the mitigation measures for fugitive dust control from SCAQMD California Environmental Quality Act (CEQA) air quality analysis handbook.[2]

Estimated Cost: Installation cost is estimated to be in a range of [redacted]

Estimated Completion Date: September 2018.

Risk Reduction Measure #5: Watering on roadways and storage piles during operating shifts to increase the surface moisture and reduce fugitive entrained road dusts. Gerdau currently utilizes water trucks to apply water for dust suppression on paved and unpaved roadways with vehicular traffic, as well as areas such as scrap and slag yards where wind may cause fugitive dust. Attachment 9 indicates the areas undergoing watering activities.

Estimated Emissions Reduction: Watering is a typical mitigation measures for controlling fugitive road dusts at relatively moderate to low cost. As discussed above, Gerdau utilizes water trucks to reduce the fugitive dust emissions. Ramboll Environ calculated the combined control efficiency for watering and sweeping for paved road using the empirical equation derived from the field measurements documented in the USEPA report.[3] As stated in the report, the control efficiency is a function of number of vehicle passes since application. Detailed calculations are presented in Appendix B. For the

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[2] SCAQMD. CEQA Air Quality Analysis Handbook, Mitigation Measures and Control Efficiency for Fugitive Dust, Table XI-D. Available at http://www.aqmd.gov/docs/default-source/ceqa/handbook/mitigation-measures-and-control-efficiencies/fugitive-dust/fugitive-dust-table-xi-d.doc?sfvrsn=2. Accessed in March 2016.

[3] USEPA. 1992. Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures. Table 3-1.

unpaved roads, Ramboll Environ conservatively assumes 84% reduction resulting from application of chemical dust suppressants only, obtained from the mitigation measures of the SCAQMD CEQA air quality handbook as discussed in Risk Reduction Measures #6.[4] For fugitive dust emissions from scrap handling and slag processing, 90% reduction is assumed due to watering based on the SCAQMD mitigation measures for material handling and storage piles.[5]

Estimated Cost: The costs associated with the water truck rental are $28,800 per year.

Estimated Completion Date: This measure has already been implemented.

Risk Reduction Measure #6: Application of dust suppressants such as Coherex, or equivalent, as needed to control the fugitive dust from storage piles and unpaved roadways by making the unpaved surface nearly the same as paved. Since June 2013, Gerdau has applied dust suppressant to the Melt Shop roads, billet yards, slag haul roads, slag processing area, and the finished goods yard in order to control fugitive dust. Coherex is a petroleum resin product that forms an asphalt-like surface on the roadways and dramatically reduces the amount of water required to maintain a dust-free surface. The product is non-toxic and approved for use by SCAQMD and the Regional Water Quality Control Board (RWQCB). The USEPA lists the use of chemical dust suppressants as one of the most effective measures for long-term stabilization of fugitive dust sources. The product brochure for Coherex is included in Attachment 10. Coherex, or an equivalent suppressant, is currently applied to surfaces requiring ongoing maintenance and other materials such as Soil2O are used to treat on all stockpiles of slag weekly. Refining the treatment schedule is an ongoing process between TAMCO, Tervita, and the dust suppressant supplier.

Estimated Emissions Reduction: Unlike watering, for which routine application is generally required, chemical dust suppressants do not require as frequent application. These chemicals suppress dust emissions by transforming the physical characteristics of the road surface, which last for a longer period of time, usually up to months. Ramboll Environ assumes 84% reduction for unpaved roads using the Coherex treatment, or equivalent material, based on the CARB study, also referenced in Western Regional Air Partnership's (WRAP) fugitive dust handbook and SCAQMD CEQA air quality analysis handbook.[6,7,8]

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[4] SCAQMD. CEQA Air Quality Analysis Handbook, Mitigation Measures and Control Efficiency for Fugitive Dust, Table XI-D. Available at http://www.aqmd.gov/docs/default-source/ceqa/handbook/mitigation-measures-and-control-efficiencies/fugitive-dust/fugitive-dust-table-xi-d.doc?sfvrsn=2. Accessed in March 2016.

[5] SCAQMD. CEQA Air Quality Analysis Handbook, Mitigation Measures and Control Efficiency for Fugitive Dust, Tables XI-B and XI-E. Available at http://www.aqmd.gov/docs/default-source/ceqa/handbook/mitigation-measures-and-control-efficiencies/fugitive-dust/fugitive-dust-table-xi-b.doc?sfvrsn=2 and http://www.aqmd.gov/docs/default-source/ceqa/handbook/mitigation-measures-and-control-efficiencies/fugitive-dust/fugitive-dust-table-xi-e.doc?sfvrsn=2. Accessed in March 2016.

[6] CARB. 2002. Evaluation of Air Quality Performance Claims for Soil-Sediment Dust Suppressants.

[7] SCAQMD. CEQA Air Quality Analysis Handbook, Mitigation Measures and Control Efficiency for Fugitive Dust, Table XI-D. Available at http://www.aqmd.gov/docs/default-source/ceqa/handbook/mitigation-measures-and-control-efficiencies/fugitive-dust/fugitive-dust-table-xi-d.doc?sfvrsn=2. Accessed in March 2016.

[8] WRAP.2006. Fugitive Dust Handbook. Available at http://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf. Accessed in March 2016.

Estimated Cost: The costs associated with dust suppressants are approximately $360,000 per year.

Estimated Completion Date: This measure has already been implemented.

Risk Reduction Measure #7: Vacuum sweeping on all the paved roads and parking lots. Gerdau currently utilizes a sweeper to operate daily on days of operation, on all paved roads that are subject to mobile equipment traffic and are accessible to mobile sweeping equipment. This cleaning is performed using a dedicated sweeper, a Tymco Regenerative Air Dustless Sweeping Technology (DST), Model DST-6 or equivalent (see Attachment 11), fitted with a high efficiency filter for dust control (99.999% on 0.5 micron particles). Other areas around the Melt Shop that are not accessible by the Tymco DST-6 will be swept with the American-Lincoln MPV-60 Industrial Rider Sweeper or equivalent or wet washed. Gerdau maintains floor cleaning records to show when the cleaning was performed.

Estimated Emissions Reduction: As discussed in Risk Reduction Measure #5, Ramboll Environ calculated the reductions as a result of both watering and sweeping using the USEPA equation derived from field measurements. The Tymco DST-6 is composed of a blower, pickup head, pressurized hopper, multi-pass cylindrical centrifugal dust separator, and particulate air filters. The blower moves air across the pickup head and the system then draws the debris-laden air stream into the hopper from which the dust in the air steam is further removed by a centrifugal dust separator and returned to the blower for the regenerative air cycle. The small portion of air steam that did not return to the blower is exhausted to the ambient air through the Ultra Low Particulate Air Filters (ULPA), which achieve 99.999% efficiency for particles as small as 0.5 micron. The dustless feature is designed to allow the sweeper to perform in all types of weather conditions.

Estimated Cost: The costs associated with this sweeping are $300,000 per year.

Estimated Completion Date: This measure has already been implemented.

Risk Reduction Measure #8: Pedestrian pathways are cleaned by wet wash or with a vacuum equipped with a filter(s) rated by the manufacturer to achieve a 99.97 control efficiency for 0.3 micron particles in a manner that does not generate fugitive dust weekly unless measurable precipitation (greater than 0.01 inches in any complete 24hr day).

Estimated Emissions Reduction: It is Gerdau's intention to reduce the potential road dust emissions from not only the process areas but also the pedestrian pathways, which would in turn reduce the chances of re-suspended dusts to travel across different areas. Ramboll Environ did not estimate the emission reductions for this specific measure, but believes that the routine housekeeping would minimize the dust being re-entrained on both paved and unpaved roads, and therefore reduce the risks associated with the roadway dust emissions.

Estimated Cost: $5,428 capital cost of the equipment.

Estimated Completion Date: This measure has already been implemented.

Risk Reduction Measure #9: Installation of a wheel wash station for scrap truck traffic exiting the Mill travelling east from the north scale. In January 2014, Gerdau installed the Neptune Maximus I Wheel Wash system that is suitable for all wheeled commercial vehicles or trailers. The system is engineered to use high volume and low pressure to eliminate track out. Attachment 12 provides a detailed description of the system.

Estimated Emissions Reduction: To prevent scrap trucks from tracking out dust at the scrap yard, Gerdau uses a wheel wash station to eliminate any potential trackout. Ramboll Environ assumed the entrained road dust emissions on the roadway segments east of the wheel wash station would be reduced by 80% based on the control efficiency for a pipe-grid trackout control device from the mitigation measures for fugitive dust from paved roads in the SCAQMD CEQA air quality handbook.[9]

Estimated Cost: The capital cost is $241,000 and the maintenance cost is $50,000 per year.

Estimated Completion Date: This measure has already been implemented.

Risk Reduction Measure #10: Relocation of the ladle preheaters and installation of the new exhaust stacks. The ladle preheaters were located within the Melt Shop building and are used to preheat empty ladles prior to use for transporting molten steel throughout the Melt Shop. The combustion emissions from the ladle preheaters used to exhaust within the Melt Shop and indirectly vented to the baghouse via the Melt Shop canopy. To reduce the heat load in the Melt Shop and air flow into the Melt Shop and thereby improve its capture efficiency, Gerdau relocated the ladle preheaters and installed additional ductwork in order to redirect the combustion emissions to vent outside the Melt Shop. This modification was completed in October 2014.

Estimated Emissions Reduction: Although there are no directly quantifiable emission reductions associated with this modification, reducing the heat load in the Melt Shop would in turn improve the overall capture efficiency of the Melt Shop, raise the plane of neutral pressure, and thus, decrease the fugitive Melt Shop emissions. With the new Melt Shop evacuation system as discussed in the Risk Reduction Measure #1, Gerdau expects to eliminate the Melt Shop fugitive emissions completely.

Estimated Cost: The costs associated with this risk reduction measure is $3,068,000.

Estimated Completion Date: This measure has already been implemented.

[9] SCAQMD. CEQA Air Quality Analysis Handbook, Mitigation Measures and Control Efficiency for Fugitive Dust, Table XI-C. Available at http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust/fugitive-dust-table-xi-c.pdf?sfvrsn=2. Accessed in March 2016.

6 Estimation of Post-Implementation Risk [Rule 1402 (f)(3)(H)]

Based on the estimated emissions reductions associated with the proposed or equivalent Risk Reduction Measures currently implemented and/or proposed and discussed in Section 5 above, Gerdau has projected the Mill-wide risk that would remain after the implementation of all the above-described measures. This assessment is presented in Appendix A. A summary of the key results metrics are summarized in Table 3:

Table 3: Post-Implementation Risk Summary

Risk/Hazard Index	Post-Implementation HRA	Rule 1402 Thresholds	HRA Result, Percent of Threshold
Maximally Exposed Individual Worker cancer risk	0.9 in a million	25 in a million	4%
Maximally Exposed Individual Resident cancer risk	7.2 in a million	25 in a million	29%
Cancer Burden	0.20	0.5	40%
Maximum Chronic Hazard Index, Worker	0.59	3	20%
Maximum 8-Hr Chronic Hazard Index, Worker	0.24	3	8%
Maximum Chronic Hazard Index, Resident	0.16	3	5%
Maximum Acute Hazard Index, Point of Maximum Impact (PMI)	0.49	3	16%

As shown above, implementation of the proposed or equivalent risk reduction measures, modeled cancer risks at the MEIR will be reduced to 7.2 in a million, modeled cancer burden will be reduced to 0.20, modeled chronic HI at the MEIW will be reduced to 0.59, and modeled acute HI at PMI will be reduced to 0.49. The MEIR cancer risk are below public notification threshold of 10 and below the SCAQMD Rule 1402 Action Risk Level of 25 in a million for cancer risk, and the cancer burden is below 0.5. Both the chronic HI and acute HI at the MEIW are also below the SCAQMD public notification threshold of 1 and below the SCAQMD Rule 1402 Action Risk Level of 3. The modeled cancer risk at the MEIW and the maximum chronic HI at the MEIR all remain below the SCAQMD Rule 1402 Action Risk Levels as those stated in the 2011 HRA. In summary, Gerdau's future operations and risk profile satisfy Rule 1402 standards, based on implementation of the measures proposed (or equivalent measures).

Source Testing

Upon completion of the mitigation measures described in this RRP, Gerdau plans to conduct testing of the new baghouse stack for dioxins and furans, along with CARB metals, lead, and hexavalent chromium. Gerdau will submit a source test protocol at least 3 months prior to conducting the testing.

7 References

California Air Resources Board (CARB). 2015. Hotspots Analysis and Reporting Program (HARP). California Environmental Protection Agency. Version 2. April. Available online at http://www.arb.ca.gov/toxics/harp/harp.htm.

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