PSD PERMIT APPLICATION FOR AS-BUILT RECONCILIATION

Integrated Aluminum Rolling Mill – Bay Minette, AL
Revisions to Equipment Design, Operating Specifications, and Emissions Limits

Novelis

Not just aluminum, Novelis Aluminum.™

Novelis Corporation

Prepared By:

TRINITY CONSULTANTS
10 Inverness Center Parkway, Suite 130
Birmingham, AL 35242
(205) 973-0657

Updated May 2026

Project 250101.0023

Trinity Consultants

TABLE OF CONTENTS

1. APPLICATION SUMMARY 1-1
   - 1.1 Project Description 1-1
   - 1.2 Summary of Regulatory Applicability 1-2
   - 1.3 Air Quality Analysis 1-3
   - 1.4 Summary of BACT Determinations 1-3
   - 1.5 Air Permitting Program Applicability and Project Timeline 1-4
   - 1.6 Organization of Air Permit Application 1-4

2. PROPOSED FACILITY AND OPERATIONS DESCRIPTION 2-1
   - 2.1 Proposed Facility Location 2-1
   - 2.2 Proposed Facility Operations Summary 2-4
   - 2.3 Proposed New Emissions Units 2-4
     - 2.3.1 "Cold End" Scrap Processing Systems 2-4
     - 2.3.2 "Hot End" Melting and Casting Area 2-6
     - 2.3.3 Hot Rolling Area 2-14
     - 2.3.4 Cold Rolling Area 2-17
     - 2.3.5 Coil Finishing Area 2-17
     - 2.3.6 Auxiliary Systems 2-19

3. PSD APPLICABILITY ASSESSMENT 3-1
   - 3.1 PSD Source Classification 3-1
   - 3.2 PSD Applicability Methodology 3-1
   - 3.3 Project Potential Emissions 3-2
   - 3.4 PSD Applicability Summary 3-2
     - 3.4.1 EPA Guidance on PSD Permit Revisions 3-3

4. SCRAP PROCESSING AREA CHANGES 4-1
   - 4.1 Process Equipment Changes 4-1
   - 4.2 Control Device Changes 4-1
   - 4.3 Air Emissions Changes 4-1
   - 4.4 Suggested PSD Permit Changes 4-1
   - 4.5 BACT Determination Updates 4-2
   - 4.6 Air Quality Analysis Updates 4-2

5. MELTING & CASTING AREA CHANGES 5-1
   - 5.1 Process Equipment Changes 5-1
     - 5.1.1 Updates to As-Permitted Process Equipment Specifications 5-1
     - 5.1.2 Changes to Emission Unit Naming Conventions 5-3
     - 5.1.3 Removal of As-Permitted Equipment 5-4
     - 5.1.4 Addition of New Emission Units 5-4
   - 5.2 Control Device Changes 5-4
     - 5.2.1 Hot Baghouse Changes 5-4
     - 5.2.2 Dross Press Control Configuration Change 5-5
   - 5.3 Air Emissions Changes 5-5
     - 5.3.1 Decoater Air Emissions Quantification 5-5
     - 5.3.2 Sidewell Melting Furnace Air Emissions Quantification 5-5
     - 5.3.3 Novelis Dual Chamber (NDC) Furnace Air Emissions Quantification 5-6

5.3.4 Round Top Furnace Air Emissions Quantification 5-6
5.3.5 Holding Furnace Air Emissions Quantification 5-7
5.3.6 In-Line Degasser Air Emissions Quantification 5-7
5.3.7 Sow Dryer Air Emissions Quantification 5-7
5.3.8 Dross House Air Emissions Quantification 5-8
5.3.9 Dross Press Air Emissions Quantification 5-8
5.3.10 Ceramic Foam Filter (CFF) and Deep Bed Filter (DBF) System Air Emissions Quantification 5-8
5.3.11 Molten Metal Utility Heaters Air Emissions Quantification 5-9
5.3.12 Casting Unit Air Emissions Quantification 5-9
5.3.13 Melting and Casting Ingot Saw Air Emissions Quantification 5-9
5.4 Suggested PSD Permit Changes 5-9
5.4.1 Decoater (X003-X005) PSD Permit Changes 5-9
5.4.2 Sidewell Melting Furnace (X006-X008) PSD Permit Changes 5-10
5.4.3 NDC Furnace (X009) PSD Permit Changes 5-10
5.4.4 Round Top Furnace (X010-X011) PSD Permit Changes 5-10
5.4.5 Holding Furnace (X008-X011) PSD Permit Changes 5-10
5.4.6 In-Line Degasser (X008-X011) PSD Permit Changes 5-10
5.4.7 Sow Dryer (X006-X007) PSD Permit Changes 5-11
5.4.8 Dross House (X004) PSD Permit Changes 5-11
5.4.9 Dross Press (X008-X009) PSD Permit Changes 5-11
5.4.10 Melting and Casting Ingot Saw (X012) PSD Permit Changes 5-11
5.4.11 Melting & Casting Insignificant Support Operations 5-12
5.5 BACT Determination Updates 5-12
5.5.1 NDC Recycle Furnace NO_X BACT Evaluation Updates 5-12
5.5.2 Holding Furnace NO_X BACT Evaluation Updates 5-13
5.5.3 Sow Dryer NO_X BACT Evaluation Updates 5-14
5.5.4 Dross Press $PM/PM_{10}/PM_{2.5}$ BACT Evaluation Updates 5-16
5.5.5 Molten Metal Utility Heaters BACT Evaluation Updates 5-16
5.6 Air Quality Analysis Updates 5-17

6. HOT ROLLING AREA CHANGES 6-1
6.1 Process Equipment Changes 6-1
6.1.1 Updates to As-Permitted Process Equipment Specifications 6-1
6.1.2 Removal of As-Permitted Equipment 6-1
6.1.3 Addition of New Emission Units 6-1
6.2 Control Device Changes 6-1
6.2.1 Ingot Scalper Filtration Unit Changes 6-1
6.2.2 Hot Reversing Mill Mist Eliminator Changes 6-2
6.2.3 Hot Finishing Mill Mist Eliminator Changes 6-2
6.3 Air Emissions Changes 6-2
6.3.1 Scalper Air Emissions Quantification 6-2
6.3.2 Scalper Chip Handling System and Conveyer Air Emissions Quantification 6-2
6.3.3 Pusher Furnace Air Emissions Quantification 6-3
6.3.4 Hot Reversing Mill Air Emissions Quantification 6-3
6.3.5 Hot Finishing Mill Air Emissions Quantification 6-3
6.4 Suggested PSD Permit Changes 6-3
6.4.1 Scalper and Scalper Chip Handling System (X013) PSD Permit Changes 6-3
6.4.2 Pusher Furnace (X014) PSD Permit Changes 6-4
6.4.3 Hot Reversing Mill (X015) PSD Permit Changes 6-4

6.4.4 Hot Finishing Mill (X015) PSD Permit Changes....6-4
6.5 BACT Determination....6-4
6.6 Air Quality Analysis Updates....6-4

7. COLD ROLLING AREA CHANGES 7-1
7.1 Process Equipment Changes....7-1
7.1.1 Updates to As-Permitted Process Equipment Specifications....7-1
7.2 Control Device Changes....7-1
7.3 Air Emissions Changes....7-1
7.4 Suggested PSD Permit Changes....7-2
7.5 BACT Determination....7-2
7.5.1 Updated Economic, Environmental, and Energy Impacts of $PM/PM_{10}/PM_{2.5}$ Control Technologies for Cold Rolling Mill....7-3
7.5.2 Updated Economic, Environmental, and Energy Impacts of VOC Control Technologies for Cold Rolling Mill....7-3
7.6 Air Quality Analysis Updates....7-4

8. COIL FINISHING AREA CHANGES 8-1
8.1 Process Equipment Changes....8-1
8.1.1 Updates to As-Permitted Process Equipment Specifications....8-1
8.1.2 Addition of New Emission Units....8-1
8.2 Control Device Changes....8-1
8.3 Air Emissions Changes....8-2
8.3.1 Tension Leveler Air Emissions Quantification....8-2
8.3.2 Alkaline Cleaning Line Air Emissions Quantification....8-2
8.3.3 Coating Line Air Emissions Quantification....8-2
8.3.4 Edge Trimmer Air Emissions Quantification....8-3
8.4 Applicable Requirements Summary for New Emission Units....8-3
8.4.1 NSPS Applicability Analysis....8-4
8.4.2 NESHAP Applicability Analysis....8-5
8.4.3 Alabama SIP Regulation Applicability Analysis....8-6
8.5 Suggested PSD Permit Changes....8-6
8.5.1 Tension Leveler (X018) PSD Permit Changes....8-7
8.5.2 Alkaline Cleaning Line (X018) PSD Permit Changes....8-7
8.5.3 Coating Line (X018) PSD Permit Changes....8-7
8.5.4 Edge Trimmer (X018) PSD Permit Addition....8-7
8.6 BACT Determination....8-7
8.6.1 Tension Leveler VOC BACT Evaluation Updates....8-8
8.6.2 Coating Line NO_X BACT Evaluation Updates....8-8
8.6.3 Edge Trimmer Electrostatic Oiler BACT Evaluation....8-9
8.6.4 Edge Trimmer Scrap Baller $PM/PM_{10}/PM_{2.5}$ BACT Evaluation....8-15
8.7 Air Quality Analysis Updates....8-18

9. BALANCE OF PLANT AUXILIARY SYSTEMS 9-1
9.1 Process Equipment Changes....9-1
9.1.1 Updates to As-Permitted Process Equipment Specifications....9-1
9.1.2 Removal of As-Permitted Equipment....9-1
9.1.3 Addition of New Emission Units....9-1
9.2 Air Emissions Changes....9-4
9.2.1 Cooling Towers Air Emissions Quantification....9-4

9.2.2 Emergency Generator Engines Air Emissions Quantification 9-4
9.2.3 Fire Pumps Air Emissions Quantification 9-5
9.2.4 Building Heating Systems Air Emissions Quantification 9-5
9.2.5 Diesel Fuel Storage Air Emissions Quantification 9-6
9.2.6 Paved Haul Roads Air Emissions Quantification 9-6
9.3 Suggested PSD Permit Changes 9-7
9.3.1 Hot Water Boiler (X019) PSD Permit Changes 9-7
9.3.2 Cooling Tower (X020) PSD Permit Changes 9-7
9.3.3 Emergency Generator Engines and Fire Pump Engines (X021) PSD Permit Changes 9-7
9.3.4 Paved Haul Roads (X022) PSD Changes 9-9
9.3.5 Building Heating Systems PSD Changes 9-9
9.4 BACT Determination 9-9
9.4.1 Building Heating System (AS-19a and AS-19b) BACT Evaluation Updates 9-10
9.5 Air Quality Analysis Updates 9-29

10. PROCESS SUPPORT AUXILIARY SYSTEMS 10-1
10.1 Process Equipment Changes 10-1
10.1.1 Updates to As-Permitted Process Equipment Specifications 10-1
10.1.2 Removal of As-Permitted Equipment 10-1
10.1.3 Addition of New Emission Units 10-1
10.2 Control Device Changes 10-3
10.3 Air Emissions Changes 10-3
10.3.1 Hot Baghouse Lime Silos Air Emissions Quantification 10-3
10.3.2 Cold Baghouse Dry Sorbent Silos Air Emissions Quantification 10-4
10.3.3 Hot Rolling Area Storage Tanks Air Emissions Quantification 10-4
10.3.4 Cold Rolling Area Storage Tanks Air Emissions Quantification 10-5
10.3.5 Coil Finishing Storage Tanks Air Emissions Quantification 10-5
10.3.6 Anodizing Test Unit Air Emissions Quantification 10-6
10.3.7 Filtering Aid Material Handling Air Emissions Quantification 10-6
10.3.8 Cold Mill Coil Marking Machine Air Emissions Quantification 10-6
10.3.9 Mill Roll Grinding Machines Air Emissions Quantification 10-7
10.3.10 Coil Finishing Roll Grinding Machine Air Emissions Quantification 10-7
10.3.11 Bearings Washing Machine Air Emissions Quantification 10-7
10.3.12 Hot Mill Parts Washing Bay Air Emissions Quantification 10-8
10.3.13 Small Parts Washers Air Emissions Quantification 10-8
10.3.14 Waste Water Treatment Plant Air Emissions Quantification 10-9
10.4 Applicable Requirements Summary for New Emission Units 10-10
10.5 Suggested PSD Permit Coverage 10-10
10.6 BACT Determination 10-11
10.7 Air Quality Analysis Updates 10-13

APPENDIX A. FACILITY EMISSION UNIT INVENTORY, PLOT/SITE PLANS AND BACT LIMIT SUMMARY

APPENDIX B. PROCESS FLOW DIAGRAMS

APPENDIX C. SUPPORTING EMISSIONS DOCUMENTATION

APPENDIX D. ADEM APPLICATION FORMS

APPENDIX E. SAFETY DATA SHEETS (SDS)

APPENDIX F. RBLC AND SIMILAR FACILITY BACT LIMIT SEARCH SUMMARY

APPENDIX G. NO_X CONTROL COST ANALYSIS

APPENDIX H. CO CONTROL COST ANALYSIS

APPENDIX I. VOC CONTROL COST ANALYSIS

APPENDIX J. GHG CONTROL COST ANALYSIS

APPENDIX K. EMERGENCY ENGINE CONTROL COST ANALYSIS

APPENDIX L. HOT ROLLING MILL CONDENSABLE PM CONTROL COST ANALYSIS

LIST OF FIGURES

Figure 2-1. Area Map Showing Novelis' Bay Minette Facility Property 2-2

Figure 2-2. Site Layout and Nearby Land Use at Novelis' Bay Minette Facility 2-3

Figure 4-1. Scrap Processing Area As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View) 4-4

Figure 4-2. Scrap Processing Area As-Permitted vs. As-Built Modeling Setup Comparison (3D/Elevation View) 4-5

Figure 5-1. Melting & Casting Area As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View) 5-18

Figure 5-2. Melting & Casting Area As-Permitted vs. As-Built Modeling Setup Comparison (3D/Elevation View) 5-20

Figure 5-3. Melter-Holder Hot Baghouse Combined Stack (MHHBH) As-Permitted vs. As-Built Downwash Parameter Comparison (3D/ View) 5-21

Figure 6-1. Hot Rolling Area As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View) 6-7

Figure 6-2. Hot Rolling Area As-Permitted vs. As-Built Modeling Setup Comparison (3D/Elevation View) 6-8

Figure 6-3. Ingot Scalper Stack (SCLP1) As-Permitted vs. As-Built Downwash Parameter Comparison (3D/ View) 6-9

Figure 7-1. Cold Rolling Area As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View) 7-5

Figure 7-2. Cold Rolling Area As-Permitted vs. As-Built Modeling Setup Comparison (3D/Elevation View) 7-6

Figure 7-3. . TCM Stack (TCM1) As-Permitted vs. As-Built Downwash Parameter Comparison (3D/ View) 7-7

Figure 8-1. Coil Finishing Area As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View) 8-20

Figure 8-2. Coil Finishing Area As-Permitted vs. As-Built Modeling Setup Comparison (3D/Elevation View) 8-20

Figure 8-3. Coating Line RTO (CL1) As-Permitted vs. As-Built Downwash Parameter Comparison (3D/ View) – Winds Out of West 8-22

Figure 8-4. Coating Line RTO (CL1) As-Permitted vs. As-Built Downwash Parameter Comparison (3D/ View) – Finishing Mill High Bay Influenced Wind Sectors 8-23

Figure 9-1. Area Source As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View) 9-30

LIST OF TABLES

Table 3-1. Proposed Project Potential Emissions (As-Permitted to As-Built) 3-6

Table 4-1. As-Permitted Modeling Input Parameters for Scrap Processing Area Point Sources 4-6

Table 4-2. As-Built Modeling Input Parameters for Scrap Processing Area Point Sources 4-6

Table 5-1. As-Permitted Modeling Input Parameters for Melting & Casting Area Point Sources 5-22

Table 5-2. As-Built Modeling Input Parameters for Melting & Casting Area Point Sources 5-22

Table 6-1. As-Permitted Modeling Input Parameters for Hot Rolling Area Point Sources 6-10

Table 6-2. As-Built Modeling Input Parameters for Hot Rolling Area Point Sources 6-10

Table 7-1. VOC Control Costs for Cold Rolling Mill in As-Built Configuration 7-4

Table 7-2. As-Permitted Modeling Input Parameters for Cold Rolling Area Point Sources 7-8

Table 7-3. As-Built Modeling Input Parameters for Cold Rolling Area Point Sources 7-8

Table 8-1. Remaining PM Control Technologies Ranked for Edge Trimmer Scrap Baller 8-17

Table 8-2. As-Permitted Modeling Input Parameters for Coil Finishing Area Point Sources 8-24

Table 8-3. As-Built Modeling Input Parameters for Coil Finishing Area Point Sources 8-24

Table 9-1. Remaining Control Technologies Ranked by Effectiveness for NO_X for the Building Heating Systems 9-18

Table 9-2. Emission Factors for Various Fuels 9-27

Table 9-3. Remaining Control Technologies for the Building Heating Systems Ranked by Effectiveness for GHG 9-28

1. APPLICATION SUMMARY

Novelis Corporation (Novelis) plans to complete constructing and to initially operate one of the first fully integrated greenfield aluminum production facilities built in the U.S. in nearly four decades. Novelis is currently in the process of constructing the proposed facility at the South Alabama Mega Site (herein referred to as the Bay Minette site) located at 49700 Alabama Highway 287 Bay Minette, AL 36507. The Bay Minette site is located near Alabama Highway 287 and I-65 in Baldwin County and is approximately 32 miles from the Port of Mobile, with access to five (5) class-1 railways, Interstate I-65, and Interstate I-10. Novelis is investing an estimated $5 billion to construct the new low-carbon aluminum recycling facility and aluminum rolling mill (i.e., an integrated aluminum rolling mill). This new facility will apply low-carbon strategies/methods/technologies to serve the strong North American demand for flat-rolled, low-carbon aluminum sheet for beverage can makers and will support the automotive industry in meeting their long-term sustainability targets. The Bay Minette project is expected to create approximately 1,000 high-paying skilled labor, advanced manufacturing, and administration jobs during the operational phase.

Based on an analysis of the potential emissions from the project's equipment scope contained within the August 2022 initial application and subsequent application updates leading up to the February 2023 final permit issuance, the facility will be classified as a major source under the Prevention of Significant Deterioration (PSD) construction permitting program. Baldwin County has been designated by the EPA as unclassified/attainment area for all criteria pollutants, thus the Bay Minette project is only subject to PSD requirements under the Alabama's State Implementation Plan (SIP)-approved New Source Review (NSR) permitting program.

Through the final engineering design and initial construction process for the Bay Minette facility that commenced after issuance of the initial PSD permit, it became necessary to make certain minor changes to the original equipment configuration and design specifications. To accommodate the project changes and facilitate issuance of a revised PSD permit, Novelis is submitting this as-built PSD permit revision application to reconcile all relevant engineering design details and operating details contained in the initial PSD permit application to the current project configuration. Due to the changes to the project equipment scope described herein, various regulatory applicability determinations from the original application have been re-evaluated and presented in this application. Updated emission calculations and a revised PSD applicability summary table are also presented. This application addresses all required elements under Alabama Department of Environmental Management (ADEM) Admin. Code r. 335-3-14-.04 for emission units affected by the as-built changes, which will allow for an efficient review by ADEM. Towards that end, Novelis will also be seeking opportunities to proactively engage with ADEM staff to provide assistance where it is beneficial to facilitate the processing of this application and issuance of the revised PSD permit.

1.1 Project Description

With the facility, Novelis anticipates that the Bay Minette facility will be the most sophisticated and sustainable aluminum rolling mill of its kind. The Bay Minette project will make significant use of advanced automation and digital technologies, including artificial intelligence, augmented reality and robotics. As noted in the Emission Unit Index provided in **Appendix A**, key process areas covered in the project scope include aluminum scrap processing, melting and casting, hot rolling, cold rolling, and coil finishing. Supporting auxiliary systems include cooling towers, emergency engines, building heating systems, dry material handling silos, diesel fuel storage and refueling stations, storage tanks for process materials, parts washing equipment, and various other support operations. Process equipment include scrap processing systems (debalers, shredders, separators, sorting, etc.), shredded scrap rotary decoaters, melting and

holding furnaces, ingot production and preparation equipment (scalpers and ingot preheating furnaces), hot rolling mill (reversing and finishing mill), cold rolling mills (2-stand/tandem cold mill), and coil finishing lines (tension levelling, strip cleaning, coil coating, edge trimming, etc.). The plant will initially produce predominantly 3000-series and 5000-series alloy in coiled sheets form for the food and beverage container and automotive markets. The proposed initial startup/commissioning timeframe for parts of the Bay Minette project is late Spring 2026, and the Bay Minette facility will be progressively commissioned as various process areas and regulated equipment in those areas begin initial operations over the next 6-12 months into calendar year 2027.

1.2 Summary of Regulatory Applicability

Pursuant to ADEM Admin. Code r. 335-3-14-.04(1), construction of a new major stationary source located in an area designated as attainment or unclassifiable is required to conduct a PSD permitting review, included a Best Available Control Technology (BACT) analysis, an Air Quality Analysis, and an Additional Impacts Analysis. The Bay Minette facility will be classified as a major source under the PSD permitting program. PSD review is required for pollutants whose emission increases, due to the project, exceed the relevant PSD Significant Emission Rate (SER) after the major source threshold (MST) for a single regulated NSR pollutant is exceeded.

Emission increases of volatile organic compounds (VOCs), particulate matter (PM), particulate matter with an aerodynamic diameter less than ten (10) microns (PM_{10}), particulate matter with an aerodynamic diameter less than two and one-half (2.5) microns ($PM_{2.5}$), carbon monoxide (CO), nitrogen oxides (NO_x), and greenhouse gases (GHGs) in units of carbon dioxide equivalents (CO_2e) due to the Bay Minette project are greater than the applicable SERs, and thus, the necessary elements of a PSD permit application for the these pollutants were included in the original application submittal and are being revised as necessary with this as-built reconciliation permit revision application. The Bay Minette project will not result in significant emissions of any other regulated pollutant, including sulfur dioxide (SO_2) and lead, and since the facility's potential for emitting these pollutants falls well below the triggering threshold, explicit PSD avoidance permit limits for the pollutants are unnecessary.

The same basic PSD applicability analysis conclusions reached in the original August 2022 PSD application for the Bay Minette facility will continue to apply to this as-built reconciliation permit action. However, the equipment design and specification changes addressed in this permit application do require updates to certain aspects of the prior PSD determinations including BACT emission limits, where minor changes in design criteria occurred. None of the proposed final design changes substantively affect the main conclusions of the prior PSD review process. The basic form and contents of the PSD permits issued for the Bay Minette facility will largely be unchanged, but certain process rate values and emission limits will need to be updated to reflect the minor differences in the final selected equipment purchases/installations as compared to the preliminary engineering design concept that the original construction permits were based upon.

The various new emission units to be installed as part of Bay Minette project will also be subject to federal New Source Performance Standards (NSPS) and/or National Emission Standards for Hazardous Air Pollutants (NESHAP). Novelis demonstrated non-applicability for the specific set of NSPS and NESHAP regulations noted in **Sections 4.1 and 4.2** of the original August 2022 PSD permit application and obtained a permit shield from these non-applicable federal air quality regulations. In addition, certain standards and limitations in the state air quality regulations from the ADEM Administrative Code apply as documented in the initial PSD permits. A discussion of the applicability of any federal and state air quality regulations impacted by the

proposed as-built changes are documented within each process area-specific section of this PSD permit revision application.

1.3 Air Quality Analysis

All air dispersion modeling analyses were submitted under separate cover as a "Volume 2" to the original PSD application with the final as-permitted modeling report being submitted in November 2022. These prior modeling analyses performed for the as-permitted configuration of the Bay Minette facility included an evaluation of ambient impacts due to Bay Minette project in the area surrounding the Bay Minette site, which is designated as a Class II area, and in one regional Class I area (Breton Wilderness). The Class II analyses provided in Volume 2 of the original PSD application demonstrated that Bay Minette project will not cause or contribute to an exceedance of any National Ambient Air Quality Standards (NAAQS) or any Class II PSD Increments. In the Class I analysis also provided in Volume 2 of the original PSD application, compliance was demonstrated with the Air Quality Related Values (AQRV) (i.e., visibility and deposition impacts) for the regional Class I areas surrounding the Bay Minette facility using an accepted screening technique recommended by the Federal Land Managers (FLM). An Additional Impacts Analysis, consisting of a growth analysis, soils and vegetation analysis, and a Class II area visibility impact assessment, was also included in Volume 2 of this original PSD application.

Novelis has carefully reviewed the as-built changes to the Bay Minette facility with respect to all relevant impacts on the modeling input parameters for modeled sources. As-built changes are relatively minor in nature and would not be expected to substantively impact the key conclusions of the as-permitted Class I and II modeling analysis dating back to November 2022. Each process area specific section that follows in this application qualitatively addresses the impacts on modeling input parameters of each as-built change to assist ADEM in its review of Novelis' application.

Consistent with the as-built modeling scoping discussions held with ADEM in December 2025 and January 2026, Novelis has prepared this revised version of the originally submitted PSD air quality analysis (Volume 2) which largely retains all of the model versions, modeling methodologies, and modeling input parameters besides those directly impacted by the as-built changes. The purpose of this as-built modeling update is to demonstrate how the as-built changes do not substantively affect modeled impacts (even for the cumulative set of changes that were made since the original permitting and modeling) in a such a manner that would adversely influence the key conclusions of the as-permitted Class I and II area modeling study.

1.4 Summary of BACT Determinations

A BACT analysis is required for each proposed emission unit emitting pollutants for which PSD permitting requirements are triggered. For the Bay Minette project, these PSD triggering pollutants are PM, PM_{10}, $PM_{2.5}$, CO, NO_x, VOC, and GHGs. The detailed BACT Analysis for the primary emission sources and all significant auxiliary systems at the Bay Minette facility was addressed in **Sections 5 through 10** of Volume 1 to the original PSD application package. A summary of the BACT determinations for each emissions source category and the revised BACT limits proposed with the as-built reconciliation are documented in a series of pollutant-specific BACT limit summary tables provided in **Appendix A**. The detailed BACT analysis for each source for the five (5) pollutant groupings from **Sections 6 through 10** and **Appendices F through L** of the original August 2022 application are supplemented as necessary within the emission unit grouping sections of this as-built reconciliation permit revision application.

1.5 Air Permitting Program Applicability and Project Timeline

To accommodate Novelis' current schedule for the Bay Minette project, Novelis would like to pursue a goal of having a draft permit issued for public comment in April 2026 in anticipation of the earliest commissioning of regulated process areas beginning as early as late second quarter 2026. This target draft permit issuance date would ensure that all of the minor modifications to proposed permit limits for affected sources final design and to also cover the new sources not envisioned in the original construction permit basis in 2022 for various insignificant support and auxiliary equipment in each process area (e.g., building heaters, parts washers, backup generators, etc.) could be made prior to the start of the commissioning process. To that end, Novelis has been and will continue to seek every opportunity to proactively engage with ADEM staff to provide whatever assistance necessary to facilitate the review and processing of this application and thereby meet these key project target dates.

1.6 Organization of Air Permit Application

Following this application summary in **Section 1**, an updated general process and site overview is included in **Section 2** to reflect the as-built configuration of the Bay Minette facility along with a description of emission sources. An updated PSD assessment for the as-built configuration of the Bay Minette facility addressing all PSD applicability considerations is provided in **Section 3.** The remaining **Sections 4 to 10** are organized by process area and address as-built process equipment and control device design and operational changes, associated air emissions changes, suggested PSD permit revisions to accommodate the as-built changes, confirmed or otherwise updated BACT determinations, and a discussion of any potential impacts on the air quality analysis from the as-built changes.

Supporting these main report sections are a series of appendices. An emission unit inventory, updated site layout drawing, and summary of BACT determinations is provided in **Appendix A**. A complete set of updated process flow diagrams is provided in **Appendix B**. A detailed set of supporting emissions documentation is included in **Appendix C** reflecting all as-built changes. A complete set of Alabama's State Implementation Plan (SIP) forms covering the project are provided in **Appendix D**. The key safety data sheets (SDS) files for the process units used directly or otherwise referenced in the emission calculations or BACT determinations are electronically and listed in **Appendix E**. Supplemental BACT documentation is included in the remaining application appendices, where the original appendix section reference from the August 2022 application is retained for clarity and continuity with the original BACT determinations. These BACT-related appendices only include updates for substantive as-built changes because in most cases, the prior BACT supporting documentation for the August 2022 original PSD application continues to apply with no necessary updates or changes.

2. PROPOSED FACILITY AND OPERATIONS DESCRIPTION

2.1 Proposed Facility Location

Novelis is currently in the process of building its new fully integrated aluminum production facility at a greenfield site in Bay Minette, AL referred to as the South Alabama Megasite. The Bay Minette site is located just off Alabama Highway 287 (AL-287) and Interstate 65 (I-65) in North Baldwin County. The Bay Minette site is approximately twenty-three miles from interstate 10 (I-10), five (5) miles from US highway 31 (US 31), and five (5) miles from Alabama Highway 59 (AL 59). The facility will be located on an approximately 2,000-acre tract of undeveloped land. **Figure 2-1** shows a general map of the area surrounding the facility, roads, and general boundaries of towns and nearby municipalities. The property boundary of the facility is also shown. **Figure 2-2** shows a closer, more detailed view of the facility, its boundaries, and the land use in the immediate surrounding area of the Bay Minette site. As can be seen from **Figure 2-2**, the land use near the facility is predominately rural and more than one mile of interstate frontage. The Universal Transverse Mercator (UTM) coordinates centered around the emission sources are 429.114 kilometers (km) East and 3,424.283 km North in Zone 16 (NAD 83).

Figure 2-1. Area Map Showing Novelis' Bay Minette Facility Property

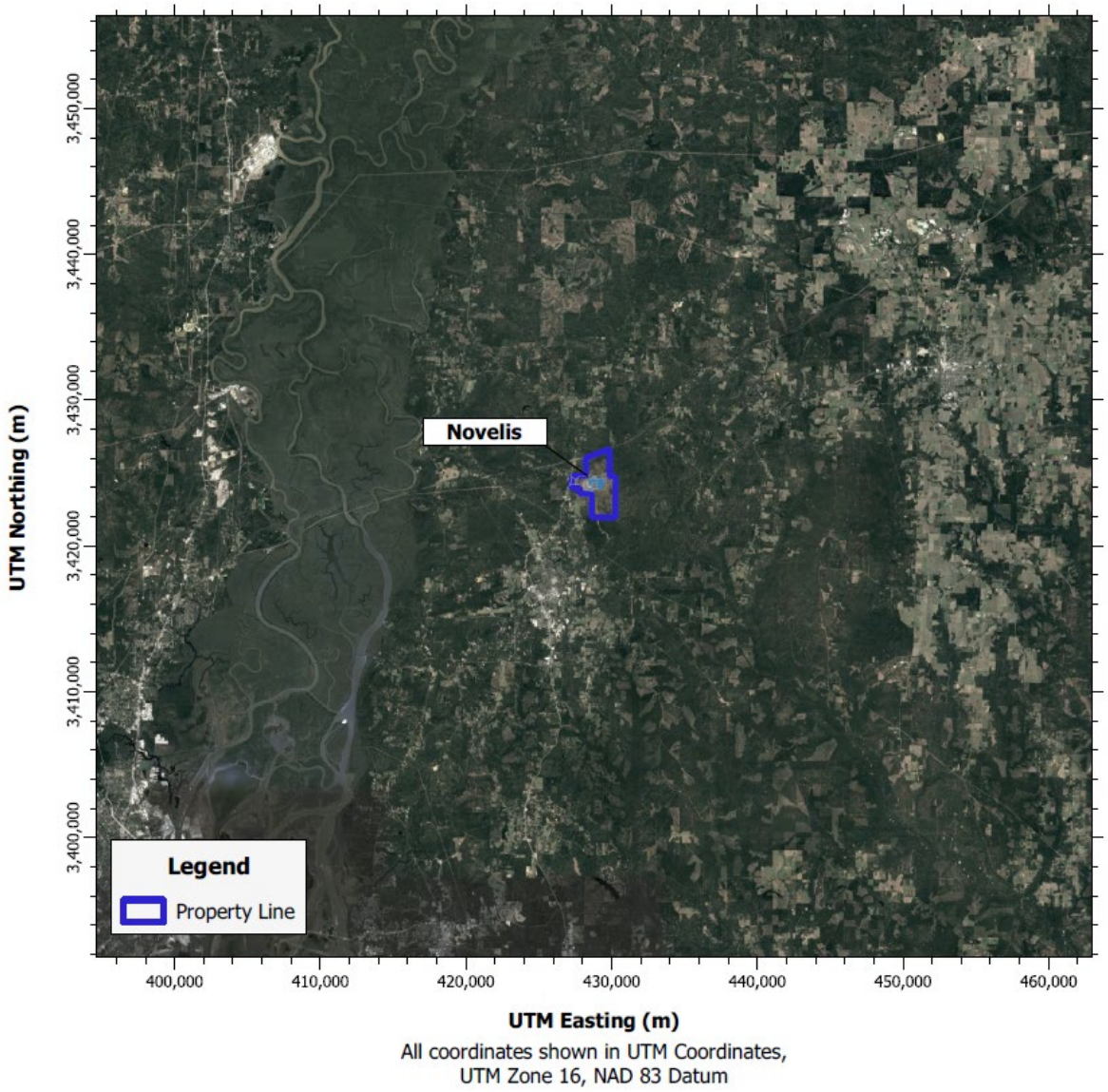
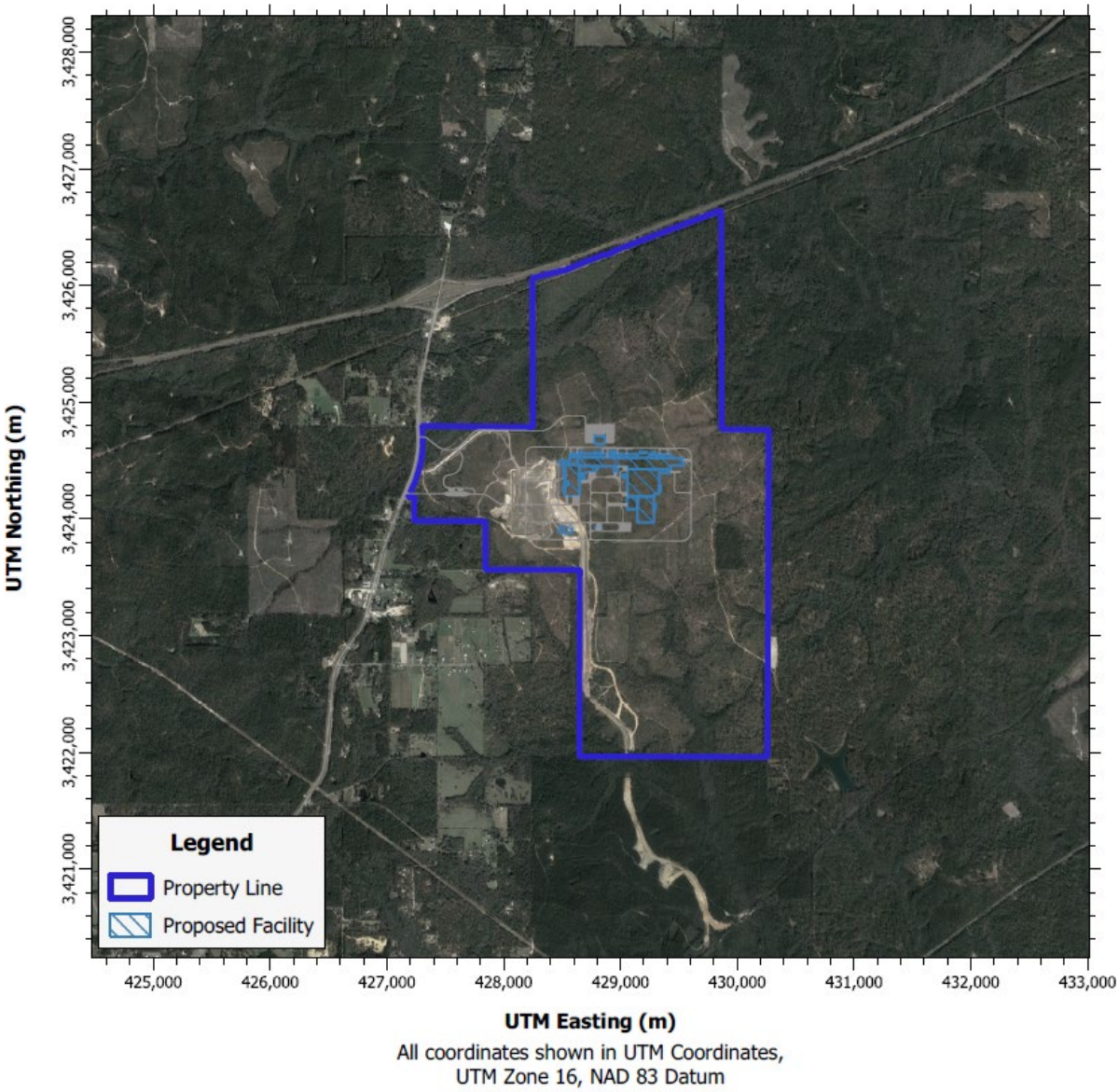


Figure 2-2. Site Layout and Nearby Land Use at Novelis' Bay Minette Facility



2.2 Proposed Facility Operations Summary

The Bay Minette facility will produce high-quality, flat-rolled, low-carbon aluminum sheets from aluminum ingots produced internally or supplied by external sources. The Bay Minette facility's targeted aluminum sheet markets primarily include beverage can and other food and beverage container companies, and the automotive industry.

Novelis commenced construction in Spring 2023 shortly after issuance of the construction permits and intends on commencing operations in the second quarter of 2026. The facility will be classified under Standard Industrial Classification (SIC) code 3341, "Secondary Smelting and Refining of Nonferrous Metals", which covers establishments primarily engaged in recovering nonferrous metals and alloys from new and used scrap and dross or in producing alloys from purchased refined metals, and SIC code 3353, "Aluminum Sheet, Plate, and Foil," which covers establishments primarily engaged in flat rolling aluminum and producing similar products by continuous casting.

The operations at the facility can be isolated into the following six (6) process area-specific categories, each of which is represented in more detail in the relevant process flow diagrams presented in **Appendix B** to this application:

1. "Cold End" Scrap Processing Systems
2. "Hot End" Melting and Casting Systems
3. Hot Rolling
4. Cold Rolling
5. Coil Finishing
6. Auxiliary Systems

2.3 Proposed New Emissions Units

2.3.1 "Cold End" Scrap Processing Systems

2.3.1.1 Scrap Processing Line #1 (Flex Line)

A scrap aluminum shredding line designated as Scrap Processing System Line #1 (Flex Line) (Emission Unit ID SP-01) will be installed as part of this project to reduce the average size of feedstock scrap for ease of downstream handling and melting in downstream process equipment. The scrap supply to the "flex line" will be sourced from the automotive and/or can stock markets, and thus, the term "flex" refers to the flexibility of this process line to receive feedstocks of different alloys from different scrap supply markets and downstream target uses. This shredding line will contain equipment classified as a new aluminum scrap shredder as defined under the NESHAP for Secondary Aluminum Production at 40 CFR Subpart RRR (herein referred to as "SMACT") and will be accomplished through the use of several discrete unit operations that will operate in a continuous manner as described below. After the scrap is shredded, the scrap sorting processes are not considered aluminum scrap shredders under SMACT.

Open market scrap, post-industrial automotive and can scrap, and "runaround" scrap (aluminum scrap materials generated on-site by aluminum casting, extruding, rolling, scalping, cutting, and trimming operations and that do not contain paint or solid coatings) are fed into the first stage of the Scrap Processing Line #1 for debaling and pre-shredding. This stage is designed for breaking oversized material in preparation for further downstream processing. Following the pre-shredding stage, the material enters the hammermill shredder, ideal for the now mid-sized scrap. Hammermill shredder discharge material then

enters several separation processes configured in series: a magnet separator for separating ferrous and non-ferrous material, an air knife for separating heavy materials from light materials and dust, a screener for further separation by size, and finally an eddy current separator separating materials by electric conductivities to separate non-ferrous metals from waste. Unwanted, non-aluminum materials are removed during these separation stages to promote overall metal quality and purity prior to decoating and melting.

Scrap Processing Line #1 primarily feeds the Scrap Sorting Line #1 (SP-05) via a direct conveyor connection. Scrap Processing Line #1 can also feed Scrap Processing Line #4 (SP-04) via Scrap Sorting Line #1 for further flexibility in processing this specialized scrap processing line focusing primarily on scrap segregation by alloy type. Shredded scrap from Scrap Processing Line #1 and Scrap Sorting Line #1 is fed to a weigh hopper/feeder supplying the shredded material to the downstream Decoaters.

PM, PM_{10}, and $PM_{2.5}$ are the only regulated pollutants expected to be emitted by each unit operation associated with Scrap Processing Line #1 and Scrap Sorting Line #1. Various pick-up points collect emissions generated by the stages of the shredding lines. Scrap Processing Line #1 is ducted to Cold Baghouse #1 (Control Device ID CBH1). Dust pickup points for hoods and enclosures serving the Scrap Sorting Line #1, the weigh/hopper feeder for Decoater #3, and the cold shredded scrap feed systems to Decoater #3 are all routed to Cold Baghouse #4 (CBH4).

2.3.1.2 Scrap Processing Line #2 (CBS Line - UBC)

Scrap Processing Line #2 (SP-02) involves scrap processing from direct feed of used beverage can (UBC) bales. The stages of this "can body stock (CBS)" Line are similar to the Scrap Processing Line #1 on the Flex Line and include a debaler and pre-shredder, hammermill shredder, magnet separator, air knife, and eddy current separator. Unwanted, non-aluminum materials are removed during these separation stages to promote overall metal quality and purity prior to decoating and melting. Scrap Processing Line #2 feeds shredded scrap to either of the two (2) weigh/hopper feeders associated with the two (2) downstream Decoaters #1 and #2 on the CBS Line.

PM, PM_{10}, and $PM_{2.5}$ are the only regulated pollutants expected to be emitted by the Scrap Processing Line #2. Various pick-up points collect emissions generated by the stages of the line. The Scrap Processing Line #2 is ducted to Cold Baghouse #2 (CBH2).

2.3.1.3 Scrap Processing Line #3 (CBS Line – Class 1 & 3)

Scrap Processing Line #3 (SP-03) involves direct feed of post-industrial can scrap commonly referred to as Class 1 & Class 3 scrap. Class 1 scrap typically includes clean, undercoated cans or cups, skeleton, slitter or trim scrap that is compacted or briquetted consisting of only 3XXX series alloys. Class 1 scrap cannot be lacquered, painted, coated or otherwise contaminated with foreign materials, and Class 1 scrap is typically restricted to contain less than 1.5% residual lubricants from the can making process. Class 3 scrap is new production 3XXX series alloys from can maker containing painted and decorated aluminum, but free of all of the other contamination applicable to Class 1 scrap. These post-industrial can scrap classifications are generally much cleaner and more uniform than open market scrap and other forms of post-industrial scrap. Therefore, Scrap Processing Line #3 only includes a single quad shaft-type shredder with a direct transfer conveyor feed to the weigh/hopper feeders, and it does not require as many separation processes as Scrap Processing Lines #1 and #2 with a more diverse scrap mix.

PM, PM_{10}, and $PM_{2.5}$ are the only regulated pollutants expected to be emitted by the Scrap Processing Line #3. Various pick-up points collect emissions generated by the stages of the line. The Scrap Processing Line

#3 is ducted to Cold Baghouse #3 (CBH3) which also serves the weigh/hopper feeders and the cold shredded scrap feed systems associated with Decoaters #1 and #2 on the CBS Line.

2.3.1.4 Scrap Sorting Line #1

A final stage of sorting following the Scrap Processing Line #1 is completed in Scrap Sorting Line #1 (SP-05). The Scrap Sorting Line #1 receives shredded and clean scrap from the last stages of the SMACT-affected Scrap Processing Line #1 and uses X-ray transmission (XRT) imaging for detailed material classification of the clean shredded scrap feed. This XRT sorting process is fully enclosed and provides a wide range of material classification and sorting capabilities depending on the specific material properties and sizes being used to differentiate between desired aluminum shred products and undesired contaminants consisting primarily of heavy metals to be separated from the primary clean shredded scrap feed. The shredded scrap from this operation is then conveyed to the Weigh Hopper/Feeder used to supply material to the decoaters (and primarily Decoater #1 on the Flex Line) for further processing. As the Scrap Sorting Line #1 does not "crush, grind, granulate, shear, or break aluminum scrap into a more uniform size", it is not classified as aluminum scrap shredders under SMACT, and thus, has been designated as a separate emission unit for the purposes of this PSD permit application.

PM, PM_{10}, and $PM_{2.5}$ are the only regulated pollutants expected to be emitted by the Scrap Sorting Line #1. Various pick-up points collect emissions generated by the stages of the sorting line. Scrap Sorting Line #1 is ducted to Cold Baghouse #4 (CBH4).

2.3.2 "Hot End" Melting and Casting Area

2.3.2.1 Decoaters

Three (3) new natural gas-fired rotary decoating kilns will be used to remove lacquers, oils, water, dust, and fines from aluminum scrap. One (1) decoater (Decoater #3; MC-01) will be installed on the Flex Line, and two (2) decoaters (Decoaters #1 and #2; MC-02 and MC-03) will be installed on the CBS Line. The decoaters will have the capability to supply hot shredded scrap to any of the five (5) sidewell melting furnaces or the Novelis Dual Chamber (NDC) Recycle Furnace. The shredded and sorted scrap will be sourced mainly from the three (3) Scrap Processing Lines via a scrap conveyor belt but can also be fed manually from shredded scrap storage bunkers. As a "unit used primarily to remove various organic contaminants such as oil, paint, lacquer, ink, plastic, and/or rubber from aluminum scrap (including used beverage containers) prior to melting", Decoaters #1-#3 will be classified as a new scrap dryer/delacquering kiln/decoating kiln as defined under SMACT.

The Decoaters use natural gas-fired combustion systems and any "fuel value" of incoming feed materials to primarily remove various organic contaminants such as oil, paint, lacquer, ink, plastic, and/or rubber from aluminum scrap (including used beverage containers) prior to melting. This aluminum decoating process is commonly performed in rotary kilns to maintain optimal temperatures and oxygen conditions for efficient remove of organic contaminants. The Decoaters have multiple primary control loops to respond continuously to maintain ideal conditions of temperature and oxygen content. Process gas containing circulated gases and generated contaminants pass from the combustion chamber through the kiln material discharge hood and down the kiln to the material inlet charge end of the kiln. The gases move up the kiln towards the material inlet location dropping in temperature. From the charging section, the process gas is drawn out of the kiln into the combustion chamber through a cyclone unit and the hot gas circulation fan. Incorporated in the ductwork upstream of the circulation fan is an automatic water dilution system, which would activate to protect the system in the event of a process gas over-temperature condition. The entry and exit air locks provide for continuous charging and discharging of material while maintaining the necessary process

environment, by not allowing outside air to influence the process. The hot gas circulation fan discharges process gases into an afterburner designed to reduce volatile organics in the gas stream. Hot gases from the afterburner can then be recycled back into the kiln for reuse and energy conservation to the extent practicable with the remainder exhausted to the flue connected into the baghouse capture and collection system.

The Decoaters will have an alternate operating scenario involving a scrap drying function for feed materials that do not contain oils, paints, or lacquers. In this operating mode, higher aluminum process rates are achievable because heat from the hot gas recirculation system is only needed to vaporize (dry) the moisture in the scrap feed and energy is not required to remove paints/coatings/lacquers. While this alternate operating mode does have a higher process rate, regulated air pollutant emissions form this "drying mode" are expected to be lower than for the primary "decoating mode" at all operating levels. As a result, this alternate operating mode does not affect the potential emission calculations or the BACT analysis. Dried scrap from this Decoater alternate operating mode would follow the same downstream use as the decoater scrap (i.e., use as feed/charge materials to the sidewell and NDC furnace). The process rates assigned for the primary "decoating mode" and alternate "drying mode" for the Decoaters represent the maximum hourly potential aluminum throughput rates for the Decoater considering inherent process equipment constraints and design capabilities. These Decoater process rates do not represent voluntary operating limitations that Novelis is seeking to be added to the initial air permit.

The Decoater exhaust outlets are routed from the integral afterburner to corresponding hot baghouses for additional waste gas treatment. Hot Baghouse #1 (HBH1) serves the decoater exhaust flue, entry/exit airlock enclosures, upper/lower rotary kiln seal hoods, and hot shred conveyors for Decoater #3. Hot Baghouse #3 (HBH3) is effectively identical to Hot Baghouse #1 and serves the Decoater #1 exhaust flue, entry/exit airlock enclosures, and upper/lower rotary kiln seal hoods and the hot shred conveyors for Decoaters #1 and #2. Hot Baghouse #2 (HBH2) is shared with the duct connections for the Dross House and serves the decoater exhaust flue, entry/exit airlock enclosures, and upper/lower rotary kiln seal hoods for Decoater #2 (i.e., the hot shred conveyors for Decoater #2 are connected to HBH3 serving Decoater #3). PM, NO_X, CO, VOC, SO_2, and GHG are the primary pollutants expected to be emitted from the Decoaters. Emissions of each will be generated from natural gas combustion as well as from the actual scrap decoating process as various contaminants present on the coated aluminum scrap are volatilized and oxidized.

2.3.2.2 Sidewell Melting Furnaces

Five (5) recuperative sidewell-type melting furnaces will be installed as part of the Bay Minette project. Two (2) sidewell melting furnaces (Sidewell Melting Furnaces #4 and #5; MC-04 and MC-05) will be installed on the Flex Line, and three (3) sidewell melting furnaces (Sidewell Melting Furnaces #1 through #3; MC-06 through MC-08) will be installed on the CBS Line. These melt the prepared aluminum and also support the use of solid reactive fluxing to reduce metal oxidation and otherwise improve the aluminum quality. The furnaces can also receive and process aluminum charge materials that contain "paint, lubricants, coatings, or other foreign materials" not classified as "clean charge." For these reasons, Sidewell Melting Furnaces #1 through #5 will be classified as Group 1 furnaces under SMACT. Each sidewell furnace can receive a continuous feed of decoated aluminum scrap into the sidewell from the Decoater and/or can receive runaround scrap or post-industrial scrap charged manually in an intermittent, batch-wise fashion into the sidewell. All sidewell furnaces will have the flexibility on a short-term basis to process a charge mix ranging from 100 percent shredded and decoated scrap to 100 percent loose scrap.

Each sidewell melting furnace has two (2) main compartments: the furnace charge well (known as the "sidewell") and the furnace main hearth. The two (2) compartments are separated by refractory-lined walls

with archways below the molten metal level to allow for thermal distribution and metal circulation between compartments. A sub-surface molten metal mixing helps to distribute shredded and decoated scrap into molten aluminum present in the sidewell. Loose scrap can also be manually charged to the sidewell in an intermittent, batch-wise fashion. Scrap melting in the sidewell occurs due to transfer of heat between the molten aluminum present in the sidewell and the aluminum scrap charged to the furnace. Molten aluminum from the sidewell of each furnace is circulated into the main hearth chamber of the sidewell furnace through the use of stirring devices. The heat source for melting in the main hearth of each sidewell is provided by natural gas-fired, regenerative burners located within the walls of the main hearth chamber. The sidewell furnaces each have high-efficiency, low NO_X regenerative natural gas burners totaling 38 MMBtu/hr arranged to maximize circulation and residence time of the exhaust gas inside the main hearth of the furnace to transfer necessary energy to heat the molten metal bath.

The main hearth chamber is equipped with a flue hearth for manual charging of prime (i.e., unalloyed, pure aluminum) and remelt secondary ingot (RSI) in the "hard charge" form (i.e., sows, T-bars, pigs, etc.). Once charged, the flue door is closed and hot process gas produced in the main hearth of the furnace is passed over the aluminum charge prior to being ducted out of the sidewell furnace main hearth flue, which is ducted into a hot baghouse. This effectively dries and preheats aluminum charge materials before contact with the molten aluminum bath present in the furnace main hearth. An automated hydraulic pushing arm is used to move the aluminum charge materials through the furnace flue hearth until reaching a sloped charging ramp, where aluminum hard charge is introduced into the main hearth molten bath.

Throughout an operating cycle and simultaneously with the addition of charge materials, solid reactive chloride salt flux is added to help purify the metal. The salt fluxing agent combines with impurities present in the molten metal and rises to the surface of the metal as dross. The dross is manually skimmed from the surface of the molten metal in both the charge well and the main hearth. To skim dross from the main hearth, a door on the main hearth chamber is opened and skimming booms are used to physically pull dross out and transfer it into dross holding pans sitting under the door lip which are subsequently transferred to the Dross Presses or directly to the Dross House.

Hoods are located over each charge well, main hearth, and furnace flue hearth, where emissions are routed to baghouses. Sidewell Melting Furnaces #4 and #5 are ducted to Hot Baghouse #4 (HBH4). Sidewell Melting Furnaces #1 and #2 are ducted to Hot Baghouse #5 (HBH5), and Sidewell Melting Furnace #3 is ducted to Hot Baghouse #6 (HBH6) shared with Holding Furnace #2 and In-Line Degasser #2. $PM/PM_{10}/PM_{2.5}$, NO_X, CO, VOC, SO_2, and GHG are the primary pollutants expected to be emitted from the sidewell furnaces. Emissions of each will be generated from natural gas combustion as well as from the actual melting process as various contaminants present on the aluminum scrap are volatilized as well as from dross formation associated with the salt fluxing.

2.3.2.3 Novelis Dual Chamber (NDC) Recycle Furnace

One (1) new NDC Recycle Furnace (or NDC Furnace; MC-09) will be installed on the Flex Line, which supports solid reactive fluxing and has the capability of receiving and processing aluminum charge materials that contain "paint, lubricants, coatings, or other foreign materials" not classified as "clean charge." For these reasons, the NDC Furnace will be classified as a Group 1 furnace under SMACT.

The NDC Furnace consists of a chamber with the main hearth and two (2) sidewells (one "open" and one "enclosed") similar to the Sidewell Melting Furnaces described above. Stirring devices will be installed in each sidewell to circulate molten aluminum. Scrap shreds are continuously charged into the open sidewell to melt them using the heat of the molten material. In the open sidewell, away from the stirring device, various types of scraps (runaround scrap and post-industrial automotive scrap) are charged by a fork truck

or loader as required. A small quantity of a fluxing agent is continuously added into the sidewell. High-efficiency low NO_X regenerative burners installed at the main hearth chamber heats the one chamber of the furnace. The NDC furnace has high-efficiency, low NOx regenerative natural gas burners totaling 48 MMBtu/hr in the main hearth chamber arranged to maximize circulation and residence time of the exhaust gas inside the main hearth of the furnace to transfer necessary energy to heat the molten metal bath. Molten metal flows from the main hearth into the enclosed sidewell, from the enclosed sidewell to the open sidewell, and back into the main hearth from the open sidewell creating a "closed loop" recirculation patten. A sidewell skim sill is located below the main door sill in case of an overfill of metal coming out of the furnace during drossing.

The other chamber of the NDC Furnace is called a dry hearth charging chamber and is fed via a charging machine with runaround scrap, post-industrial automotive/can scrap, and/or open market scrap. The charging chamber has a cold-air burner with a maximum burner heat input rating of 11.3 MMBtu/hr, where the cold air burner is fired in a fuel-rich condition to maintain the chamber free oxygen concentration and to hold the chamber temperature at a target temperature for optimum removal of various organic contaminants (such as oil, paint, lacquer, or other coating types). Another stirring device circulates molten metal between the main chamber and the charging chamber. Molten metal flows from the NDC Furnace to the holding furnaces via pneumatically controlled tapping plugs at the hearth level as well as at the midpoint of the bath.

Hoods are located over the open sidewell, side door, sidewell skim sill, main hearth, and charging chamber, where emissions are routed to a common shared baghouse Hot Baghouse #7 (HBH7). Hot Baghouse #7 is shared with Holding Furnace #3 and In-Line Degasser #3. $PM/PM_{10}/PM_{2.5}$, NO_X, CO, VOC, SO_2, and GHG are the primary pollutants expected to be emitted from the NDC Furnace. Emissions of each will be generated from natural gas combustion as well as from the actual melting process as various contaminants present on the coated aluminum scrap are volatilized as well as from dross formation associated with the salt fluxing.

Dross is manually skimmed from the surface of the molten metal in multiple locations within the NDC Furnace. To skim dross from the main hearth, a door on the main hearth chamber is opened and skimming booms are used to physically pull dross out and transfer it into dross holding pans sitting under the door lip. Dross is skimmed from the surface of the molten metal at the open sidewell on the same side of the furnace as the main hearth door. Finally, dross is skimmed from the surface of the enclosed sidewell using a "side door" on the same side of the furnace where loose scrap is charged to the open sidewell. All dross removed from the sidewell and main hearth portions of the NDC Furnace is subsequently transferred to the Dross Presses or directly to the Dross House.

2.3.2.4 Round Top Melting Furnaces

Two (2) new natural gas fired round top furnaces will be installed [one (1) Round Top Furnace #2 (MC-10) for the Flex Line and one (1) Round Top Furnace #1 (MC-11) for the CBS Line]. The furnaces will predominantly melt clean charge and will not use reactive chlorine/fluorine containing flux. However, Novelis is seeking the operating flexibility to use third-party scrap (similar to internal runaround scrap from the rolling mill) that would be bare aluminum with small amounts of lubricants/oils on the surface. Because third-party scrap that could be charged to the Round Top furnaces may not always be "entirely free of paints, coatings, and lubricants", these units will be classified as Group 1 Furnaces under SMACT.

To load a Round Top Furnace, the furnace cover will be removed and overhead charge buckets will transfer scrap and prime material through the opening at the top of the furnace with the use of an overhead crane system. If significant time is expected between loading charge buckets, the furnace cover will be replaced to avoid unnecessary heat loss. Once fully charged, the furnace cover will be closed and the aluminum charge

will be exposed to heat from the regenerative burners to facilitate the melting process. Each furnace will be equipped with a stirring device to agitate the molten metal and create heat uniformity in the batch. Dross can be skimmed from the surface of the molten metal in the round top furnace using a similar skim boom-based process described previously for the other melting furnaces, where the furnace metal surface is accessed from the cleaning door. Alloying agents/hardeners can also be fed to the Round Top Furnaces as needed where the specific alloying elements used and specific formulation will depend on the desired product specifications.

Emissions generated from the Round Top Furnaces will each be routed to respective hot baghouses (Hot Baghouses #8 and #9; HBH8 & HBH9) shared with the holding furnaces and in-line degassers. Low NO_X regenerative burners are used to heat the furnace and metal is circulated with a stirring device. The Round Top furnaces have a regenerative natural gas-fired combustion system with total maximum burner heat input capacity of 112.0 MMBtu/hr. The regenerative combustion system consists of three (3) burner pairs, where each burner is equipped with a regenerator (heat exchanger). One of the regenerators of the burner pair will be heated by the waste gases extracted from the furnace chamber, while the other burner/regenerator configuration of the pair is used simultaneously to heat the furnace. The cold combustion air is heated by the heat storage media before it is mixed with the natural gas fuel and burned. Once the regenerative burner cycle time has elapsed, the flow directions in the "heating mode" and "firing mode" burners are reversed. A hood is located over the cleaning door and emissions from this hood, main furnace flue, and "exhausting mode" regenerative burner duct connections are routed to a baghouse. $PM/PM_{10}/PM_{2.5}$, NO_X, CO, VOC, SO_2, and GHG are the primary pollutants expected to be emitted from the Round Top Furnaces.

2.3.2.5 Holding Furnaces

Four (4) new holding furnaces will be installed to receive molten metal from the upstream melting furnaces as well as clean charge materials during startup and other non-routine operating periods. Two (2) Holding Furnaces will be installed on the Flex Line (Holding Furnaces #3 and #4; MC-12 and MC-13) to discharge molten metal into two (2) associated In-Line Degassers #3 and #4 at the two (2) Flex Line casting pits (a.k.a., DC3 & DC4). The remaining two (2) Holding Furnaces will be installed on the CBS Line (Holding Furnaces #1 and #2; MC-14 and MC-15) to discharge molten metal into the two (2) associated In-line Degassers #1 and #2 at the two (2) CBS Line casting pits (a.k.a., DC1 and DC2). The holding furnaces support solid reactive fluxing. Therefore, the holding furnaces will be classified as Group 1 furnaces under SMACT.

Once tapped, molten aluminum produced by any of the eight (8) upstream melting furnaces [five (5) Sidewell Melting Furnaces, NDC Furnace, or two (2) Round Top Furnaces] will flow via troughs to one (1) of the four (4) molten aluminum holding furnaces. As the designated holding furnace is being filled, the doors to the furnace remain open so that operators can monitor the filling process and perform other metal processing steps. A forklift with a boom attached is used to mix the metal flowing into the holding furnace as it fills, if necessary. Alloying agents are added to the molten bath and to metal in the trough leading from the melting furnaces. The exact composition of the alloying agents added is dictated by the properties of the molten metal entering the holding furnace and the designated properties of the final cast ingot, which are monitored by analyzing samples taken after the metal has been treated in the melting furnaces. After the necessary alloying agents are added, solid reactive flux is injected into the holding furnaces to help with metal purity control. Dross generated during the Holding Furnace operating cycle will be removed through a skimming door, placed in dross pans, and transferred to the Dross Presses or directly to the Dross House for further processing. Heat will be provided by two (2) natural gas-fired cold air burners. The holding furnaces each have low NO_X, cold-air natural gas burners totaling 27 MMBtu/hr arranged to allow charging, skimming, fluxing, and casting and to facilitate cleaning from the exterior of the furnace.

Once the designated holding furnace is filled, it will be tilted gradually upward to provide a continuous flow of molten aluminum for ingot casting. After alloying, fluxing, and drossing activities are all complete, the metal is ready for transport through one of four (4) in-line degassers to the cast bay. After the cast bay is prepared, one of the four (4) holding furnaces is tilted to allow metal to flow into the trough which ultimately feeds the cast center.

Under normal operation, the designated holding furnace remains tilted and metal flows until the desired cast length has been achieved. Typically, a small amount of molten metal is retained in the furnace as the heel, allowing for additional molten metal transfers during subsequent casting cycles. At this point, the holding furnace returns home and can be refilled by tapping any number of the eight (8) associated melting furnaces. Once the holding furnace is filled to its desired level, it is tilted and emptied once again. This cycle repeats until the desired number of ingots has been cast in the cast bay.

Hoods are located over each furnace hearth door and flux door, where emissions are routed to a baghouse. Holding Furnace #1 is routed to Hot Baghouse #9 (HBH9). Holding Furnace #2 is routed to Hot Baghouse #6 (HBH6). Holding Furnace #3 is routed to Hot Baghouse #7 (HBH7), and Holding Furnace #4 is routed to Hot Baghouse #8 (HBH8). $PM/PM_{10}/PM_{2.5}$, NO_X, CO, VOC, SO_2, and GHG are the primary pollutants expected to be emitted from the holding furnaces. Emissions of each will be generated from natural gas combustion as well as from flux addition and dross formation from the salt fluxing.

2.3.2.6 In-Line Degasser

As a "device exterior to a furnace, located in a transfer line from a furnace, used to refine (flux) molten aluminum", four (4) In-Line Degassers will be classified as new in-line fluxers per SMACT. Two (2) In-Line Degassers #3 and #4 (MC-33 and MC-16) will be installed on the Flex Line, and two (2) In-Line Degassers #1 and #2 (MC-18 and MC-17) will be installed on the CBS Line. The degassers will be used to remove dissolved hydrogen from the molten metal as it flows from the Holding Furnaces to the casting bay. The proposed treatment process is based on the gas flotation principle. A rotor injects and evenly disperses an ascending flow of tiny bubbles of process gas (inert gas) into the melt. Hydrogen is removed by desorption into the gas bubbles. The inclusions are captured by the bubbles, either by collision when sufficiently large, or radial interception if too small. The bubbles with the inclusions then rise to the surface of the melt forming dross. Alkali compounds are reduced, especially when adding chlorine to the process gas. A small quantity of chlorine gas with argon serving as an inert carrier gas will condition the metal. In addition, if additional treatment is required for alkaline elements (e.g., sodium, calcium, and lithium) removal, the same process will happen in this in-line degasser, as a final metal conditioning step prior to casting.

If dross is generated during the degasser operating cycle, it will be removed at the end of the cast sequence and placed into dross pans, which will then be transferred to the Dross Presses or directly to the Dross House for further processing. However, based on the sealed degasser hood design planned for this system, dross generation is expected to be negligible, as the sealed design prevents ingress of ambient air/oxygen and negligible opportunity to form oxides (i.e., dross). As it flows out of the flux box towards the casting bay, metal flows through a mass of filtering media designed as a final physical separation step for any remaining impurities.

The operating cycle for the In-Line Degassers is defined to be "initial Holder tilt to final Holder home", as this accurately reflects the time metal is actually flowing through the fluxers (i.e., a shorter time period than the defined holder cycle which includes the time to fill the holder furnace and the associated holder activities to prepare the metal for casting).

On both the Flex Line CBS Line where a dedicated degasser serves a single holding furnace, emissions are routed into the associated Holding Furnace chamber whenever metal flow through the degasser is occurring and are discharged into the baghouse serving the Holding Furnace. PM, PM_{10}, $PM_{2.5}$, and HCl are the primary pollutants expected to be emitted from the degasser from the metal production.

2.3.2.7 Sow Dryers

To support the melting furnaces, two (2) Sow Dryers (Sow Dryers #1 and #2; MC-19 and MC-20) are planned, which dry and preheat aluminum sows and other forms of hard "clean charge" materials prior to manually feeding into the furnaces. The Sow Driers will be fired with natural gas via six (6) cold air burners. The emissions from natural gas combustion will exhaust through a dedicated, uncontrolled stack for release to the atmosphere.

2.3.2.8 Dross Handling and Storage

Dross produced during aluminum melting and processing activities in each of the eight (8) Melting Furnaces, four (4) Holding Furnaces, and four (4) In-line Degassers will be removed from each unit, collected in dross pans, and transported either to the Dross Presses #1 through #2 (MC-24 and MC-22) or directly to the Dross House (MC-21).

One (1) of two (2) planned dross presses can be used to extract molten metal from the dross prior to routing it to the Dross House. The pressing cycle commences with the dross press door opening and a forklift truck positioning the dross pan within the dross press chamber. The pressing sequence begins as the specially designed air-cooled ram head is lowered into the surface of the dross. This press head is designed to squeeze aluminum out of the dross to maximize the in-house recovery while at the same time cooling the dross. The press head does not disturb the dross surface or promote formation of dross particles as would occur within a rotary dross cooler or other types of mechanically aided dross cooling devices. The plug of dross in the pan is simply compressed to separate molten aluminum from the semisolid impurities and flux materials.

Once the pressing cycle is complete, the dross pan can be removed from the press. The system is then ready for the next pan to be positioned in the press. The pressed dross "skull" remaining in the skim pan is routed to the Dross House, and the recovered metal is used as a charge material for the melting furnaces. Based on these principles of operation, one of the benefits from employing a dross press cited by the manufacturer, other than recovering more aluminum for processing, is the ability to cool the dross more quickly, thereby minimizing the amount of any residual dust and fume generation within the plant.

The Dross Presses will be equipped with an integral exhaust collection and filtration system, used primarily for nuisance fume/dust control to prevent worker exposure at the opening of the equipment which discharges directly into the production building. Through the use of integral filtration unit, Novelis will ensure any PM/PM_{10}/$PM_{2.5}$ emissions that are associated with the operation of the Dross Presses are captured and controlled to the same level of performance as the main Dross House area.

Once dross pans are moved to the Dross House either directly from the furnaces/degasser or from the Dross Presses, dross will be cooled, stored, and eventually shipped off-site for third-party processing and metal reclamation. Hot Baghouse #2 shared with Decoater #2 is used to control PM emissions associated with the Dross House and collects any PM/PM_{10}/$PM_{2.5}$ generated by the dross pan cooling stations, pan dumping stations, and truck loading operation.

2.3.2.9 Molten Metal Transfer and Casting Operations

In order to prevent temperature drop when molten metal comes in contact with the refractory of the trough, during transfer from melting furnaces to holding furnaces, the troughs will be electrically pre-heated. The project includes a total of 46 small hand-held Molten Metal Utility Heater units (MC-35) spread across various casting, holder, and melting areas to remove moisture present on hand tools that the operators use in close direct contact with molten metal and to support removal of molten metal blockages in the trough system. The units are identified as a preventative safety measure for protection against potential molten metal explosions. These heaters are sources of uncaptured natural gas combustion byproduct emissions. The Molten Metal Utility Heater burners do not have stacks and thus combustion by-product emissions are released into the Melting & Casting Area building.

A new cast bay consisting of four (4) direct chill casting pits and capable of supporting twenty (20) vertically-oriented ingot casting molds will be installed as part of the Bay Minette project. All of the DC1 to DC4 casting pits will each hold five (5) ingots. Molten metal will flow from the in-line degassers through a metal filtration process and into casting molds where molten metal solidifies, forming ingots. All of DC1 to DC4 casting bays use both a ceramic foam filter (CFF)-type and a deep bed filter (DBF)-type metal filtration device. The CFF and DBF refractory must be preheated to ensure that filter box inside temperatures are within acceptable ranges and do not lead to temperature drop of molten metal. This heat will be provided by dedicated natural gas-fired preheaters (MC-26, MC-27, MC-28, and MC-34). The CFF/DBF preheaters are sources of uncaptured natural gas combustion byproduct emissions. The CFF/DBF preheater burners do not have stacks and thus combustion by-product emissions are released into the Melting & Casting Area building.

On an intermittent basis between ingot casting cycles, Novelis plans to apply a small amount of a Gargoyle Arctic SHC 226E or 200 series synthetic base lubricating oil[1] stock to the ingot casting molds to facilitate the DC casting process and prevent the molten aluminum from adhering to the surface of the molds. The high temperature of the molten aluminum is assumed to eventually drive off the lubricant in the form of VOC emissions from the DC1-DC4 Casting Unit- Lubricant Usage (MC-31) released into the Melting & Casting Area building.

2.3.2.10 Melting and Casting Ingot Saw

An ingot sawing operation will be located in the Melting & Casting area for cutting reject ingots down to smaller sizes before feeding to the melting furnaces. The operation of the Ingot Saw will generate aluminum fines, which will be collected by a saw process cyclone and discharged into a hopper. Exhaust air from the cyclones will vent to a dedicated filtration unit (Filtration Units #1; FLT1) that discharges exhaust directly into the production building. Chips generated by the saw will be transferred to a briquetting unit, which will convert the chips to consistently sized briquettes. There are no emissions associated with the briquetting system.

Emissions from the Ingot Saw will consist of filterable PM and hazardous air pollutants (HAP) associated with the aluminum dust generated by the saws and VOC associated with lubricant usage. Condensable PM emissions are excluded due to the process temperature. Therefore, filterable PM emissions are equivalent to total PM emissions.

[1] SDS included in Appendix E.

2.3.3 Hot Rolling Area

The hot rolling area will consist of one (1) ingot scalper, one (1) scalper chip handling system pneumatic conveyor associated with a briquetting machine, three (3) Pusher Furnaces, one (1) Hot Reversing Mill (HRM), and one (1) Hot Finishing Mill (HFM). The following subsections provide detailed descriptions of the unit operations associated with the hot rolling area.

2.3.3.1 Ingot Scalper

One (1) Ingot Scalper will be installed in the front end of the hot rolling area. This scalper will be used for machining the rolling surfaces and edges of the ingots. Specifically, this scalper will cut the ingot surfaces to the required dimensions, remove the casting skin and metallurgical impurities from the ingot surfaces, and establish the required surface quality. Undiluted high-performance cutting lubricant will be applied in relatively low quantities to facilitate the machining process.

The operation of the Ingot Scalper will generate aluminum chips, which will be captured by a chip collection hood and routed to a dedicated crusher. A fan will be used to pneumatically convey these crushed chips through one of two (2) product collection cyclones. Exhaust air from the scalper chip production collection cyclones (inherent process equipment) will be discharged directly to an add-on emissions control device (Filtration Unit #4; FLT4) for PM generated by the scalpers and primary chip handling system. The collected chips will be transferred to one of eight (8) chip storage bins. After passing through a de-dusting process, these chips will eventually be fed to a briquetting machine. In summary, the chip processing system for the Ingot Scalper will consist of a dedicated crusher, product collection cyclones, a filtration unit-type PM control device, and associated chip storage bins. Chips generated by the scalper will be sorted by alloy type. Emissions from the Ingot Scalper will consist of filterable PM associated with metal dust generated by the scalpers and VOC associated with lubricant usage.

2.3.3.2 Scalper Chip Handling System Pneumatic Conveyor for Briquetter

The Scalper Chip Handling System Pneumatic Conveyor for the Briquetter (HR-03) will transport scalper chips from the chip bins associated with the Ingot Scalper operation to the hopper feeding the briquetting machine. The purpose of the machine is to produce uniform size briquettes with increased density that results in better melting efficiency in the furnaces where they are consumed. An induced draft fan will blow the scalped chips into a product collection cyclone, where the scalped chips will be dropped into the hopper. The exhaust air from the product collection cyclone will be tied into the main Ingot Scalper filtration unit's collection system for PM emission control. However, to offer the flexibility of direct venting of the pneumatic conveyor production collection cyclone's discharge air to the atmosphere during periods of maintenance of the Ingot Scalper larger filtration unit, the potential PM emissions for the cyclone are quantified without taking credit for the additional PM removal offered by the Ingot Scalper's filtration unit. The scalped chip transport systems associated with the pneumatic conveyors will be almost entirely enclosed to minimize the possible sources of fugitive dust generation.

2.3.3.3 Pusher Furnaces #1 - #3

Three (3) Pusher Furnaces will be installed in the hot rolling area. The primary purpose of these Pusher Furnaces is to (1) reheat and soften the ingots, thereby minimizing the mechanical force required to reduce an ingot's thickness during rolling operations, and (2) raise the alloy's temperature above the recrystallization temperature to prevent strain-hardening from taking place during rolling. The temperature in each Pusher Furnace will follow a controlled cycle, which will vary depending on the type of alloy and intended metallurgical properties. Each Pusher Furnace will be equipped with multiple natural gas-fired open flame burners in each temperature-controlled furnace zone and will have a total rated capacity of

104.9 MMBtu/hr per furnace. A shared central recuperator or individual burner "self-recuperative" system will be used to preheat incoming combustion air for the burners. The recuperators will use exhaust gas to preheat combustion air and improve fuel efficiency. Each Pusher Furnace will exhaust through a dedicated natural draft stack to discharge natural gas combustion byproduct emissions (i.e., Pusher Furnaces are not a known source of emissions from aluminum processing).

2.3.3.4 Hot Rolling Mill – Reversing Mill and Finishing Mill

The Hot Rolling Mill will include one (1) single-stand reversing Roughing Mill (i.e., Reversing Mill) and one (1) four (4)-stand Finishing Mill, along with roller tables, a vertical edger, shears, and coilers. After passing through a vertical edger, the ingot will proceed via the roll table to the single-stand HRM. The mill's reversing capabilities will allow the aluminum slab to pass back and forth through the HRM (edger and main mill stand). The roller spacing will be adjusted with each pass, such that each subsequent pass through the rollers further reduces the slab's thickness. Due to the significant amount of heat that will be formed by the pressure applied to the work rolls in the HRM, a water-based oil emulsion will be used as a coolant for the work rolls while they are in operation. The coolant will also double as a lubricant to prevent aluminum from sticking to the steel work rolls. Various spray headers above and below the roll table will be used to cool and lubricate the rollers, edger, and shears. The roll coolant emulsion used in the HRM and HFM is composed of purified water mixed with hydrocarbons in the form of base rolling oil and additives. The water to hydrocarbon ratio for a typical hot roll mill coolant package is approximately 90%-95% purified water and 5%-10% hydrocarbons. The HRM base rolling oil (QH EVEROLL™ A 2300 NS1 or equivalent; refer to SDS in **Appendix E**) is a mineral oil-based emulsifiable fluid with a high molecular weight, high boiling point, and low vapor pressure. Additives used in the HRM coolant package include long-chain, high molecular weight, and low volatility emulsifiers, surfactants, fatty esters, fatty acids, and antioxidants. The intended purpose for adding each material is generally to prevent corrosion/oxidation, control thermal stability, and prevent premature degradation.

In addition to roll coolant, a kerosene-based petroleum distillate (or similar light hydrotreated petroleum distillate) will be sprayed as a "bite aid" to facilitate the work rolls biting onto the ingot during the threading process at the mill stand. A coolant recirculation system is used to transport used coolant from the mill sump, store "dirty" coolant for further processing, remove contaminants washed from the aluminum slab and mill enclosure using a filtration process, store clean coolant, and cool the outgoing coolant destined for the HRM's spray system.

The roll table feeding the HFM will span a sufficient distance from the HRM stand to allow the tail end of the slab to exit the Reversing Mill stand while it is being initially fed and threaded into the Finishing Mill. Before a new ingot can be fed into the HRM, the HFM initial "bite" process must be completed wherein the head end of the slab is confirmed to occupy a satisfactory position at the Stand 1 roll bite. The four (4) sets of hydraulic roll stands in the HFM have a basic 4-high configuration (i.e., work roll and backup roll above and below the aluminum strip). The progressively smaller gaps between the work rolls in each of the four (4) HFM stands are then used to compress the slab into a raw gauge coil. These raw gauge coils are further processed in the downstream cold rolling and finishing areas to produce final gauge and width coils meeting specifications to satisfy customer demands.

When the slab is reduced in thickness in the HFM, the total mass and volume of metal remains essentially the same (with the exception of head and tail scrap to remove deformed ends of the coil being processed) but the dimensions are redistributed. Because the width of the slab is minimally changed throughout the hot rolling process, any reduction in thickness creates a proportional increase in length to maintain the constant volume/mass. For example, if a slab with a starting thickness of 1 inch is rolled down to 0.1 inches in the Finishing Mill, the 10 times reduction in thickness results in a coil that is about 10 times longer than the

slab. Therefore, the line speed of the strip exiting the third and final stand of the Finishing Mill is 10 times faster than the speed of the slab entering the first mill stand. This "strip acceleration" phenomenon requires roll speeds for Stand 1, Stand 2, Stand 3, and Stand 4 to be progressively higher from stand-to-stand. Each speed increase from Stand 1 to Stand 2, from Stand 2 to Stand 3, etc. must be large enough to keep tension on the strip and prevent buckling, but the increase cannot be too large or strip tears can occur. The roll gap at each mill stand is another operating parameter that can be controlled to maintain the correct gauge reduction and strip tension. Larger gauge reductions at each stand require more turning power, so roll speeds and turning power must also be coordinated. The HFM's control system uses sensors measuring strip tensions, roll speeds, and roll power relationships to ensure the raw gauge coil specifications are maintained and the incoming slab can be efficiently processed without unnecessary line speed slowdowns or excessive roll power consumption.

Similar to the HRM, a water-based oil emulsion roll coolant is applied at the HFM to remove excess heat; to avoid dulling strip surface or causing undesirable surface marks, and to prevent the aluminum strip from sticking to the steel work rolls. Coolant is applied to the work roll-strip interface by a series of sprayers located at each mill stand (above and below the strip). Slab cooler spray systems are also used at the entry hood and inter-stand areas of the Finishing Mill to further remove heat from the strip. The HFM base rolling oil (LMC-XX or equivalent; refer to SDS in **Appendix E**) is a highly refined hydrotreated heavy naphthenic petroleum distillate with a high molecular weight, high boiling point, and low vapor pressure. Additives used in the HFM coolant package serve the same general purpose as the HRM coolant additives and include long-chain, high molecular weight, and low volatility emulsifiers, synthetic lubricants, surfactants, fatty esters, fatty acids, and antioxidants. A similar coolant recirculation system to the HRM is used for the HFM to minimize coolant losses and maintain a stable and high-quality coolant supply available to the mill.

Like the HRM, Novelis plans to apply a kerosene-based petroleum distillate (or similar light hydrotreated petroleum distillate) "bite aid" to the HFM stands to facilitate the initial "biting" process of feeding the slab into each of the four (4) mill stands, if a bite refusal is expected to occur. The kerosene cleans the work rolls with each new slab fed to the mill to ensure the bare metal of the work roll is exposed to the face of the aluminum slab thereby enabling reliable threading of the slab into the mill. Any residual roll coolant or contaminating hydraulic oils or greases on the work roll when the biting process is being initiated may prevent the slab from securely entering the mill stand causing slabs to be rejected, misaligned, or otherwise improperly secured. The amount of kerosene needed to be effective can vary with the product being rolled, coolant formulation and associated coolant properties, physical arrangement of the mill, and rolling practices (including gauge reduction and line speed).

After exiting the mill stand, the strip is edge-trimmed to ensure the coil maintains a constant width throughout its length. Edge trim scrap is conveyed to a storage tub for staging before being transported to the furnace charge handling area of the Melting & Casting area. The trimmed strip is then fed to a tension reel that wraps the emerging strip onto a cylindrical mandrel beginning the tightly wound coil using a "belt wrapper." After the tail end of the strip emerges from the mill, the hot rolled coil is complete. The mandrel of the coiler then contracts, so it can be removed leaving only the coiled aluminum strip.

Emissions from the HRM and HFM will consist of filterable PM, condensable PM, and VOC. The air pollution control train for the hot rolling mills starts with a dedicated fume collection system consisting of hoods and enclosures for both the HRM and HFM. Each of the HRM and HFM "fume exhaust systems" will route the collected emissions from the mill to a dedicated mist eliminator (Mist Eliminator #1 or ME1 for the HRM and Mist Eliminator #2 or ME2 for the HFM).

2.3.4 Cold Rolling Area

2.3.4.1 Tandem Cold Mill #1

One (1) 4-high Tandem (2-stand) Cold Mill (TCM) (CR-01) will provide cold rolling capability. In the TCM, the hot rolled coils are unwound, rolled and gauge reduced, and rewound. This process can be repeated with multiple "passes" for a single coil through the TCM to reduce the coils to the desired thickness, depending on the targeted end-product specifications. The overall mill assembly is designed to produce coils with accurate dimensions (both thickness and width), appropriate flatness, and freedom from surface defects.

A water-based oil emulsion roll coolant package is applied to the back side of the work rolls and to the bottom of the strip at the entry and inter-stand locations. Other minor components of the organic fraction of the water-based oil emulsion roll coolant mixture include linear C12-C16 alcohols, heavy organic contaminants (i.e., hydraulic fluid, gear oil, etc.), and coolant additives (such as biocides and surfactants). Although this coolant application process serves several functions, its primary function is to remove heat generated from the compression of the aluminum strip and to prevent sticking of the strip to the steel work rolls. A secondary system of spray headers for "bite lube" supplied with base rolling oil will be installed on the TCM. The TCM base rolling oil (Magiesol® 47 or equivalent; refer to SDS in **Appendix E**) is a mineral oil-type petroleum distillate with a high molecular weight, high boiling point (487-538 deg. F), and low vapor pressure (0.034 mmHg at "room temperature"). The base rolling oil, used as both the oil fraction of the water-based oil emulsion and as the bite lube, performs two primary objectives: 1) spray lubrication at the entry to each mill stand, and 2) water containment through the use of sprays at carefully selected locations throughout the mill. The bite lube's function in water containment is to dilute and/or remove water from the strip to prevent water streaking and/or staining, which are defects considered unacceptable on can sheet products. Entrained water-oil emulsion coolant and rolling oil mist and vapor will be captured through the mills' hooding and fume containment systems and will be routed to a condenser designed primarily for condensable PM emissions control and secondarily for some VOC emissions control and then a multi-stage mist eliminator system designed for PM control.

2.3.5 Coil Finishing Area

2.3.5.1 Tension Leveler

One (1) can coating line Tension Leveler (CF-01) will be installed at the Novelis Bay Minette Facility. The tension leveler consists of a set of rolls that flex and stretch process metal to remove any buckling and promote flatness and uniformity when in "bending mode". The tension leveler can also operate in "pure stretch mode" in which the work rolls are opened and not engaged on the strip. The flattening is achieved by both bending and stretching the coil strips through application of tension by the grip of the entry and exit rolls in bending mode and the bridle rolls in pure stretch mode. When bending, a lubricant is sprayed onto the coil strip at the tension leveler rolls to protect the surface of the metal as it passes over the rolls. The applied lubricant has a low vapor pressure meaning it has the potential to become volatile; however, the contribution to VOC emissions within the coil finishing area building will be relatively small.

2.3.5.2 Alkaline Cleaning Line

One (1) can coating Alkaline Cleaning Line (CF-02) will be installed at the facility. At the entry end of the can coating line, upstream of the entry accumulator, aluminum coils are unwound and stitched to the preceding coil. The strip first passes through the tension leveling section and then passes through a cleaning and rinsing section where a water-based alkaline solution is sprayed onto the sheet to remove any

previously applied residual lubricant oil that may present on the coil surface prior to downstream surface coating processes. Any water mist generated from the intensive spray cleaning is collected and routed through a scrubber (Wet Scrubber #1; SC1) with an integral demister before being routed out of the building via a stack. Some organic material and inorganic PM, either as a gas or aerosol, may be present in the water mist routed through the scrubber. Novelis will use a hot air blower to remove any moisture on the strip at the exit of the Alkaline Cleaning Operation.

2.3.5.3 Coating Line #1

The Coating Line (CF-03) is used to apply coating to both sides of the strip. The coater has a "S" type configuration with a set of back-up rolls, one top coating head with two rolls (applicator and pick-up roll), and one back coating head with two rolls (applicator roll and pick-up roll). The coating heads are designed to work at the same time and are placed in a way to permit coating of both sides of the strip in one continuous pass through the coating line. The coating machine is designed for the precise application of the coating to the top and bottom side of the passing strip via forward or reverse application. A curing oven will be utilized to cure the reference strip at maximum process speed when a coating (not exceeding the defined maximum solvent load) is applied to it. The oven will be capable of reaching the defined target peak metal temperature (PMT). The oven is heated by recovered heat from the regenerative thermal oxidizer (RTO) (RTO1) and by zone burners (one for each zone) mounted in the zone circulation chamber. An air cooler will cool the strip after it leaves the curing oven. Filtered ambient air will be fed to the air cooler's last zone either from the inside or from the outside of the building. The air will then be cascaded into the upstream cooling zones. Exhaust air from the first zone at the entry end of the air cooler will be discharged into the atmosphere without treatment. A multi-chamber RTO with a high thermal energy recovery efficiency will be used to control VOC emissions from the coating line coater heads and the curing oven using a series of natural gas-fire burners.

2.3.5.4 Edge Trimmer

As a final finished coil processing step, a high-speed Edge Trimmer will be installed at the facility to meet customer specifications for desired coil edge straightness and finished coil widths. The Edge Trimmer consists of a coil entry system, in-line coil preparation, electrostatic oiling, side trimming, scrap suction and high-speed recoiling, along with various auxiliary systems and electrics/automation. The edge trimming shears are not a source of regulated air pollutant emissions because no lubricant is used in the cutting process and no aluminum fines are generated at the cutting interface. However, the Electrostatic Oiler (CF-04) is a source of VOC and PM emissions from the application of a semi-synthetic ester-based lubricant for electrostatic application in support of food and beverage customer applications commonly referred to as "post-lube" (Bonderite® L-FM and PL-A, Coralube™ 4000 CPL, or equivalent; refer to SDS in **Appendix E**). Also, the Scrap Baller (CF-05) associated with the scrap suction and processing component of the Edge Trimmer is a source of PM emissions.

Depending on customer specifications, the Electrostatic Oiler may be used to electrostatically apply a thin, uniform film of lubricant onto the surface of the coil strip. In the Electrostatic Lubing system, lubricant is applied to the moving aluminum strip via a spray blade that employs an electrostatic process. A high voltage charge is applied to the lubricant as it leaves the spray blade. The charged and atomized lubricant is drawn by opposite charge to the surface of the coil strip. Due to the electrostatic nature of the applicator, the transfer efficiencies are extremely high and there is very minimal overspray; however, the organic component of the lubricant may evaporate over time. The minimal amounts of PM and VOC emissions from the Electrostatic Lubing process are uncaptured and discharge into the Coil Finishing building.

An integral scrap suction system on the Edge Trimmer continuously collects the thin, ribbon-like edge trimmings from the trimming shears and conveys the raw scrap to a Scrap Baller which compacts the edge trimming into dense, manageable, and easy-to-transport "balls". The compaction process of the Scrap Baller forms the scrap balls which are collected in a bin below the fully enclosed machine. Exhaust duct pickup points located on the discharge section of the Scrap Baller route any aluminum fines and other forms of PM generated by the baller and conveyance process to a venturi-type, water-based wet scrubber for PM removal. The treated exhaust from the scrubber's direct drive radial fan is discharged to the atmosphere from a roof penetrating stack on the Coil Finishing building.

2.3.6 Auxiliary Systems

2.3.6.1 Cooling Towers

A total of five (5) multi-cell mechanical draft cooling towers are present at the Bay Minette facility. One (1) cooling tower (Caster Cooling Tower #1; AS-04) supports the cooling water needs of the casting area. One (1) cooling tower (Hot Mill Cooling Tower; AS-05) supports the cooling water needs of the hot mill. One (1) cooling tower (Cold Mill Cooling Tower; AS-26) supports the cooling water needs of the cold mill. One (1) cooling tower (Finishing Cooling Tower; AS-27) supports the cooling water needs of the finishing area. One (1) cooling tower (Round Tops/Pushers Cooling Tower; AS-28) supports the cooling water needs of the round top furnaces and the pusher furnaces in the ingot casting and preparation areas. As the water flows down through the cooling towers, the draft air picks up water droplets that can be emitted from the top of each tower (i.e., "drift loss"). Mist eliminators are present on each cooling tower to minimize drift loss. PM, PM_{10}, and $PM_{2.5}$ emissions result from residual solids remaining after evaporation of liquid droplets released from the cooling tower.

2.3.6.2 Emergency Generator Engines

Nine (9) natural gas-driven emergency generators are present to supply power in the event of unforeseen outages at the Bay Minette facility. Three (3) engines are rated at 304 hp (Emergency Generator Engines #1, #2, and #10; AS-06, AS-07, and AS-29) and used to supply backup power to the Security Office, Administration Building, and Maintenance Building. One (1) engine is rated at 160.9 hp (Emergency Generator Engine #5; AS-10) and supplies backup power to critical equipment associated with the Hot Reversing Mill. Two (2) engines which supply backup power to critical equipment associated with the Hot Finishing Mill and Cold Mill are rated at 261.5 hp (Emergency Generator Engines #6 through #7; AS-11 and AS-12). Three (3) engines are rated at 63.9 hp (Emergency Generator Engines #11 through #13; AS-30 through AS-32) and supply backup power to each of the three Decoaters in the Melting and Casting area. Each engine will be fueled with natural gas, and the resulting combustion emissions will exhaust to the atmosphere through their dedicated stacks for those units that are located outside of the building. The small backup generators serving the Decoaters are located adjacent to the associated process equipment that it would service. Therefore, Emergency Generator Engines #11 through #13 (AS-30 through AS-32) are located inside of the Melting and Casting building and discharge exhaust directly into the building environment for subsequent release through roof-mounted HVAC vents. All engines are EPA Certified Engines, and Certificates of Conformity for the engines can be found in **Appendix D**.

2.3.6.3 Fire Pump Engines

There are two (2) emergency firewater "pump houses", each equipped with two (2) engines used to power the emergency firewater pumps to provide fire suppression to the Bay Minette facility. The North Pump House contains one (1) electric engine and one (1) diesel-driven engine rated at 700 hp (Fire Pump Engine #1; AS-15). The West Pump House contains two (2) diesel engines rated at 510 hp, each (Fire Pump

Engines #3 through #4; AS-17 and AS-18). All diesel engines have been certified to Tier 3 standards, and records of the certifications can be found in **Appendix D**. The electric engine is not a source of emissions, but emissions that result from the combustion of diesel fuel to power the engines will exhaust to the atmosphere through their dedicated stacks.

2.3.6.4 Building Heating Systems

Novelis has 66 building heating units to comprise a single "Building Heating Systems" designated emission unit (AS-19). The building heating units can be split into two categories: "Make-Up Air Units" and "Unit Heaters". The make-up air units are used to control the temperature in the main production buildings for the safety of workers and the protection of temperature-sensitive equipment. The 37 Make-Up Air Units (AS-19a through AS-19d) range in size from 32,000 cfm to 150,000 cfm air flow capacities with corresponding natural gas, direct-fired combustion system heat input ratings of 2.25 MMBtu/hr to 11.55 MMBtu/hr. The 22 Unit Heaters (AS-19e through AS-19h) are associated with the Central Maintenance building which stands alone in a courtyard area between the Coil Finishing building on the west side of the facility and the Melting and Casting/Scrap Processing building complex on the east side of the facility.

The Central Maintenance Building requires its own building heating systems strictly for comfort heating, so the unit heaters serving the Central Maintenance Building have much lower natural gas heat input ratings ranging from 0.045 to 0.175 MMBtu/hr. Each building heating system uses a direct-fired combustion system with natural gas as the only available fuel. The potential emissions from natural gas combustion will exhaust through dedicated, uncontrolled vents for release with the heated air directly into the associated building. Building roof vents and other openings will ultimately discharge the building heating system combustion byproduct emissions to the atmosphere.

2.3.6.5 Hot Baghouse Lime Silos

Five (5) alkaline reagent storage silos are present to supply alkaline reagent (lime) to the Hot Baghouses #1- through #9 [Hot Baghouse Lime Silos (5); AS-20]. The silos will be pneumatically loaded via truck on a periodic basis. Integral bin vent filters will be used to discharge air from the pneumatic silo loading process. PM, PM_{10}, and $PM_{2.5}$ emissions are expected.

2.3.6.6 Cold Baghouse Dry Sorbent Silos

Two (2) dry sorbent storage silos are present to supply dry sorbent (diatomaceous earth or equivalent) to the Cold Baghouses #1- through #4 [Cold Baghouse Dry Sorbent Silos (2); AS-33]. The silos will be pneumatically loaded via truck on a periodic basis. Integral bin vent filters will be used to discharge air from the pneumatic silo loading process. PM, PM_{10}, and $PM_{2.5}$ emissions are expected.

2.3.6.7 Process Area Storage Tanks

The Hot Rolling area will include fourteen (14) fixed roof storage tanks [Hot Rolling Area Storage Tanks (14); AS-22] for managing the coolant supply to the HRM and HFM. As shown in Section 33 of **Appendix C** and Figure B-5 of **Appendix B**, the HRM coolant area contains four (4) main storage tanks/chambers [Sump Tank, three (3) chambers of the Emulsion Main Tank, and Storage Tank for Cleaning] and three (3) smaller, auxiliary tanks to support the main storage tanks/chambers (Base Oil Tank, Premix Tank, and Additive Tank). The basic purpose and function of these tanks is associated coolant filtration and temperature management systems are described below:

- *HRM Emulsion Sump Tank*: The Sump Tank effectively acts as a surge vessel receiving used coolant directly from the mill pan and transferring it to the dirty chamber of the Emulsion Main Tank.

- *HRM Emulsion Main Tank- Dirty Chamber*: Used coolant collected from the HRM will flow from the sump tank to the dirty coolant chamber of the Emulsion Main Tank. This portion of the tank will be equipped with a skimming device to collect impurities accumulating on the liquid's surface as waste. From this chamber, the used coolant is circulated to the intermediate chamber.
- *HRM Emulsion Main Tank- Intermediate Chamber*: The intermediate chamber of the Emulsion Main Tank, which will be located between the used coolant and clean coolant chambers, will accept overflows from both adjacent chambers along with a fresh feed of demineralized water. The resulting emulsion will be pumped to two vacuum filters located at a higher level than the tanks. The vacuum filtered emulsion will then flow to the clean coolant chamber, while skimming machines (one for each vacuum filter) will be used to remove impurities from the surface within the vacuum filter. These impurities will be discarded as waste. The filter is also equipped with an overflow connected to the used coolant chamber. Some of the emulsion from the intermediate chamber also will be pumped to the plate cooler-type, non-contact heat exchanger and electrical heater system for temperature control before being piped back to primarily the clean chamber.
- *HRM Emulsion Main Tank-Clean Chamber*: As previously indicated, vacuum filtered liquid will be accumulated in the clean coolant chamber of the Emulsion Main Tank. From this chamber, the clean coolant can be pumped through the heat exchanger/electrical heater system (i.e., the same system that heats/cools the intermediate coolant stream) for temperature control, before being piped back to the clean coolant chamber. Additionally, base rolling oil and additives from the Premix Tank can be added to the chamber. From the clean coolant chamber, the emulsion will be pumped through a backwash filter to the HRM for use as a coolant and lubricant to facilitate the rolling process. However, if the level of liquid in the clean coolant chamber reaches a threshold, this coolant will overflow into the intermediate chamber for further processing.
- *HRM Emulsion Base Oil Tank:* The smaller Base Oil Tank stores virgin/purchased rolling oil for use as a makeup in the formulation of the water-based oil emulsion roll coolant package. Makeup base rolling oil is added primarily to the intermediate coolant supply line to the heat exchanger/electrical heaters.
- *HRM Emulsion Premix Tank:* The Premix Tank has the same storage capacity as the Base Oil Tank and stores a "premixed" formulation of base rolling oil and additives. The Premix Tank primarily supplies the clean chamber of the Emulsion Main Tank.
- *HRM Emulsion Additive Tank:* Purchased coolant additives are stored in barrels and totes. Additives from these containers are transferred into a small additive tank equipped with a pump to transfer specific additive materials either into the Premix Tank or directly into the main clean coolant supply lines to the HRM coolant spray system.

An analogous coolant supply system will be installed on the HFM, where the only significant difference from the HRM coolant supply system is the size and number of storage, filtration, heating/cooling, and pumping equipment. The HFM coolant area has two (2) Main Emulsion Tanks with a larger coolant holding capacity than the HRM Main Emulsion Tank due to the higher coolant supply volumes associated with the 4-stand HFM. The HFM coolant area also uses five (5) vacuum filters as opposed to the two (2) vacuum filters used in the HRM coolant area.

The Cold Rolling area will include thirteen (13) fixed roof storage tanks [Cold Rolling Area Storage Tanks (13); AS-23] for managing the coolant supply to the TCM. As shown in Section 33 of **Appendix C** and Figure B-6 of **Appendix B**, the TCM coolant area contains six (6) main storage tanks/chambers [two (2) chambers of the TCM Emulsion Main Tank, one (1) Main Oil Separation Tank, and three (3) chambers of the

TCM Rolling Oil System Tank], five (5) smaller, auxiliary tanks to support the main storage tanks/chambers [Rolling Oil Separator Tank, Hot Edge Spray (HES) System Main Oil Tank, Base Rolling Oil Supply Tank, and two (2) Multi-Plate Filter Mixing Tanks), and two (2) rolling oil bulk storage tanks (Rolling Oil Bulk Supply Tanks #1 and #2). The basic purpose and function of these tanks and associated coolant filtration and temperature management systems are described below:

- *TCM Emulsion Main Tank – Dirty and Clean Sections (T1)*: The TCM Emulsion Main Tank (T1) is separated into two (2) main compartments: one (1) for storage of clean coolant and one (1) for storage of "dirty" cold mill coolant routed directly from the cold rolling stands and stored prior to filtration/processing for subsequent recycling back to the coolant supply systems. The dirty coolant compartment offers the water-oil emulsion recirculated from the mill sump an opportunity to separate into layers by gravity. Skimmers floating on the liquid surface in this compartment pull the separated oil/sludge fraction of the coolant from the very top of the water/oil level and pump the recovered oil/sludge to the TCM Main Oil Separation Tank (T2) and subsequently to the vacuum-type sludge filters. The oil separated from the sludge in the filter will then be fed into the TCM Rolling Oil Separator Tank (T3) with baffles internally that allow for the separation of any water that may have been carried through the sludge filter. The bottom water layer of the dirty section of the TCM Emulsion Main Tank is pumped to a water filter, which removes contaminants and returns the clean water to the clean section. The contents of the clean section of the TCM Emulsion Main Tank are pumped back to the roll coolant spray headers in the rolling mill after passing through a filter and cooling water-supplied heat exchanger for temperature management.
- *TCM Main Oil Separation (T2)*: The TCM Main Oil Separation Tank (T2) receives dirty oil separated from the TCM Emulsion Main Tank (T1) and rolling oil directly from the two (2) mill stands drained from collecting pans. The Main Oil Separation Tank feeds the vacuum-type sludge filter for processing separated dirty rolling oil.
- *TCM Rolling Oil Separator Tank (T3)*: After the oil layer from the dirty section of the TCM Emulsion Main Tank (T1) is passed through the Main Oil Separation Tank (T2) and sludge filter, the filtered rolling oil is pumped into a smaller Rolling Oil Separator Tank (T3) for further separation of water and oil. The Rolling Oil Separator Tank then supplies partially treated rolling oil into the dirty section of the TCM Rolling Oil System Tank.
- *TCM Rolling Oil System Tank – Dirty, Circulation and Clean Sections (T4)*: The dirty section of the TCM Rolling Oil System Tank (T4) receives partially treated rolling oil from the Rolling Oil Separator Tank (T3) and discharges via an overflow weir into the circulation section. Partially treated rolling oil stored in the circulation section is pumped to two (2) parallel plate filters. The coolant filtration process uses a vertically stacked series of pressure plate filters to remove metals fines and heavy oils/greases with the assistance of specially designed solid filtering aids (e.g., diatomaceous earth). The dirty oil is injected into the dirty side of the filter plate apparatus. As the oil is forced through the filtering aid "body" and subsequently through the filter cloth media, the contaminants are removed restoring the oil to a clean state and allowing for recirculation to the rolling mill. The clean oil from the plate filters is discharged into the clean section of the TCM Rolling Oil System Tank. Clean oil can be circulated through a "heating loop" using an electrical heater for raising the temperature of the clean oil, or clean oil can be directly routed to the bite lube spray headers in the TCM with or without passing through a cooling water-supplied heat exchanger for reducing the temperature of the clean oil. The clean section of the TCM Rolling Oil System Tank (T4) also supplies a vacuum distillation unit (VDU) for removing heavy oils and other impurities. The main components of the VDU process include the water stripper for removing any residual water, the electric heating assembly, vacuum distillation chamber, distillate receiver tank, distillate cooler, vacuum pump, and bottoms holding tank. The VDU operates as a closed system with no vent to the atmosphere because the distillate

overhead system achieves complete condensation without the need to vent non-condensable gases. Finally, purchased base rolling oil can be added to the dirty section of the TCM Rolling Oil System Tank (T4) from the TCM Base Rolling Oil Tank (T6) as makeup for any losses occurring in the rolling oil recirculation process. The TCM Base Rolling Oil Tank (T6) is supplied by the Rolling Oil Bulk Supply Tanks #1 and #2 (TK-001) which receive the bulk deliveries of rolling oil from trucks.

The Coil Finishing area will include twenty-two (22) fixed roof storage tanks [Coil Finishing Area Storage Tanks (22); AS-24] to support various process operations in the Coil Coating Line. Coating Tank A will store the alkaline cleaning solution (Gardoclean S 5675 or equivalent; refer to SDS in **Appendix E**) used in the Alkaline Cleaning Line, but this material does not contain any chemicals that form regulated air pollutant emissions from storage operations. Therefore, Coating Tank A is not considered further in the VOC emission calculations presented in Section 33 of **Appendix C**. Five (5) storage tanks (Coating Tanks B through E and G) will supply coatings to the primary roll coating operations in the Coating Line (refer to "Contents" Section 33 of **Appendix C** and SDS in **Appendix E** for specific coating types, properties, and compositions). One (1) storage tank (Coating Tank F) will store water contaminated with up to 10% waste solvents and coatings from the Coating Line clean process. Two (2) storage tanks (Stage 1 and 2 Alkaline Cleaning Tanks) will provide the recirculating alkaline cleaning solution bath to the Alkaline Cleaning Line. While the alkaline cleaning solution itself does not generate regulated air pollutants from storage operations, the alkaline cleaning solution bath contains a small fraction of cold rolling oils and tension leveler lubricant, which is conservatively assumed to form a pure organic compound oil layer on the surface of the alkaline cleaning tanks. Similar to the main Coating Line A for bulk storage of the alkaline cleaning chemical, the smaller Alkaline Cleaning Day Tank used for management of flow between the bulk tank and the Alkaline Cleaning Line is not a source of regulated air pollutant emissions. Seven (7) Paint Day Tanks will be used to manage flow or coatings between the main Coating Tanks B through E and G and the coater section of the Coating Line. These smaller paint day tanks have the same material properties as the larger, bulk coating tanks. Finally, four (4) Pretreatment Day Tanks will supply pretreatment chemicals to the strip preparation section of the Coating Line, but similar to the alkaline cleaning chemical tanks, these pretreatment chemicals do not contain any regulated air pollutants and do not generate regulated air pollutant emissions during storage.

Volatile organic liquids (VOL) storage vessels can be a source of VOC and HAP emissions from evaporative losses of stored material due to cyclical fluctuations in storage temperature (i.e., breathing losses) and from vapor displacement caused when material is loaded into the tank (i.e., working losses). As shown in Section 33 of **Appendix C**, Novelis has calculated the potential VOC and HAP emissions from the hot rolling, cold rolling, and coil finishing area storage tanks using TankESP®. A summary of the main tank parameters and emissions output can be found in Section 33 of **Appendix C** and detailed TankESP® reports on an individual tanks basis are available as electronic attachment to the emissions summary, upon request by ADEM. The maximum annual throughputs assigned to some of the cold rolling area tanks considers the level-controlled nature of these tanks operating in the coolant recirculation loops, and thus, the assigned throughput rates do not match the coolant/rolling oil flow capacities to the cold rolling mills in all cases.

2.3.6.8 Diesel Fuel Storage and Refueling Stations

There are four (4) diesel storage tanks located on site [Diesel Fuel Storage and Refueling Stations (4); AS-21]. The main 15,000 gallon capacity tank stores diesel fuel for various on-site material transport vehicles (e.g., fork trucks and other vehicles) operated in and around the Bay Minette facility. The remaining three (3) 572 gallon tanks store diesel to fuel the three diesel fueled fire pumps in the pump houses. VOC emissions are expected from breathing, loading, and working losses of the tank.

2.3.6.9 Vehicle Movement on paved Plant Roads and Storage Yards

When a vehicle travels on haul roads, the air currents created by the turbulent vehicle wake can cause any silt on the road surface to become entrained, generating particulate matter emissions. The property will have been entirely prepared with paved roads, lots, and yards.

2.3.6.10 Anodizing Test Unit

One (1) anodizing unit [Anodizing Test Unit; AS-34] located in the Hot Rolling process area of the Bay Minette facility will be used to coat sample sheets of aluminum in abrasion and corrosion resistant oxide layer. The particular anodizing process implemented in this unit will use a sulfuric acid bath to generate the oxide layer when an electric current is applied. Expected emissions include particulate matter and sulfuric acid mists. Exhaust collected from the anodizing tank will be collected and routed to a scrubber/demister before being released to the atmosphere.

2.3.6.11 Filtering Aid Material Handling

During the hot and cold rolling processes, surface metals, dirt and impurities that are on the sheet will wash or rinse off in the recirculating coolant systems as the aluminum sheet passes through the metal rollers. The accumulated solids are separated and removed from the recirculating coolant and settled in closed process storage tanks. This sludge must then be removed through a filtering process before the solid waste can be sent off-site for disposal. The multiplate filter serves the coolant supply system (not an air emissions source) by filtering contaminated coolant to prolong coolant life and prevent equipment damage. The multiplate filter uses filtering material which must be replenished throughout the operation. The Filtering Aid Material Handling (AS-35) emission unit designation represents a batch process consisting of filtering aid being manually dumped into a mixing tank through a hatch. Up to twice a day, filtering material (e.g., diatomaceous earth and Fuller's earth) will be unloaded from bags into the hatch of the mixing tank. The dropping of the filtering aid releases PM as fugitive emissions into the building. All other aspects of the filtering aid material handling process are fully enclosed and do not generate PM emissions.

2.3.6.12 Cold Mill Coil Marking Machine

The coils produced by the cold mill will be marked with ink that may contain a small amount of organics to provide specific details of the coil (i.e., unique ID number, weight, metallurgy/product codes, etc.) using one (1) coil marking machine [Cold Mill Coil Marking Machine; AS-36]. VOC emissions are expected due to the potential volatilization of organic compounds in the ink and solvent used by the machine. Inks will be used to apply the marking directly to the warm exterior surface of the coil that was just completed by the mill. Related SDSs can be located in **Appendix E**.

2.3.6.13 Mill Roll Grinding Machines

Three (3) roll grinding machines [Mill Roll Grinding Machines (3); AS-37] will grind down metal rolls used in the cold and hot mills that have developed imperfections on the roll surface to return them to original uniform surface characteristics. These surface imperfections can lead to a variety of quality issues with final sheet appearance that would not meet customer specifications.

These grinding machines operate as a circular grinder lubricated by a water-based coolant emulsion. The emulsion is used to cool the material as well as collect the metal shavings that have been removed from the rolls. The coolant emulsion will be filtered and reused until replacement is necessary. Particulate matter emissions are not anticipated as the coolant emulsion will trap metal fines as they are removed. Small amounts of VOC may be released due to volatilization of the coolant emulsion which is approximately 4%

cutting oil and 96% water. VOC emissions will be released into the building. Related SDSs can be located in **Appendix E**.

2.3.6.14 Coil Finishing Roll Grinding Machine

One (1) grinding machine [Coil Finishing Roll Grinding Machine; AS-38] used to grind down polyurethane rolls that are used in the coil finishing area. These rolls collect metal fines and develop burs over time and require a periodic grinding process to prepare the rolls for reuse with uniform surface characteristics to prevent quality rejects. In order to process coils properly and to meet customer quality specifications for potential surface/appearance imperfections, the rolls must be smooth at the point of contact with the roller and the metal sheet. The Coil Finishing Roll Grinding Machine uses a rotating cutting head to remove a small amount of material from the polyurethane rolls in a dry process. Particulate matter emissions are expected and will be collected via an integral cyclone/filtration and stored in an anti-explosion drum before being sent off-site for disposal. Exhaust air from the roll grindings collection system will be released at the filtration system stack to the atmosphere. Related SDSs can be located in **Appendix E**.

2.3.6.15 Bearings Washing Machine

Various machine bearings used in the process will accumulate grease and dirt over time. These will be cleaned via a bearings washing machine [Bearings Washing Machine; AS-39]. The washing machine will store a specialized cleaning solution to be filtered and reused until fresh cleaning fluid is needed. When replacement is needed, the cleaning solution reservoir can be replenished, and the spent cleaning fluid will be disposed of as waste. Low levels of VOC emissions may occur due to volatilization of VOC-containing compounds in the aqueous, detergent like cleaning fluid. A demister is installed on the washing machine's exhaust to mitigate the potential for any liquid cleaning solution mist/droplets emissions with a 90% removal efficiency. The demister releases treated exhaust into the building. Related SDSs can be located in **Appendix E**.

2.3.6.16 Hot Mill Parts Washing Bay

Various parts in the hot mill will accumulate grease and dirt over time. The parts that cannot be easily washed using the various parts washers available will be cleaned in the Hot Mill Parts Washing Bay [Hot Mill Parts Washing Bay; AS-40]. The washing bay will use a specialized cleaning solution. The used cleaning solution will be collected and disposed of as waste. Low levels of VOC emissions may occur due to potential volatilization of compounds in the aqueous, detergent like cleaning fluid. These emissions will be released into the building as fugitives. Related SDSs can be located in **Appendix E**.

2.3.6.17 Small Parts Washers

Several small solvent-containing parts washers will be located in operating and maintenance area support shops to clean small hand tools and various small process-related equipment components and parts as part of routine maintenance activities. When cleaning is needed, there are seven (7) maintenance washers [Maintenance Parts Washers (7); AS-42] and four (4) roll shop drum mounted washers [Roll Shop Parts Washers (4); AS-41]. Cleaning fluid will be stored in the washer's reservoir for use and is recirculated through a lavatory/sink with faucet that is located on top of the parts washer's solvent basin. The fluid passes through a filter and will be reused until fresh cleaning fluid is needed. When replacement is needed, the reservoir will be emptied, and the remaining spent cleaning fluid and filter will be disposed of as waste. The maintenance parts washers will use a petroleum distillate-based cleaning fluid with citrus to clean the parts while the roll shop parts washers will use a specialized cleaning fluid for breaking down emulsions. Low levels of VOC emissions may occur due to volatilization/evaporation of compounds in the cleaning fluid when the lid of the washer is open or exposed to the interior of the building from those areas where they

are located. These emissions will be released into the various production building locations as fugitives. Related SDSs can be located in **Appendix E**.

2.3.6.18 Waste Water Treatment Plant

The Waste Water Treatment Plant (WWTP) process area includes the necessary on-site equipment to remove processing oils and other contaminants (i.e., hydrocarbons, metals, particulate, TSS, BOD, etc.) from the hot and cold rolling mills' and coating line cooling water systems via the use of separation, settling, neutralization/buffering, filtration and membrane batch reactor processes before routing it to the local POTW for final treatment and discharge. The incoming wastewater streams are not significant sources of regulated air pollutant emissions because any chemical compounds present as contaminants in the wastewater are not HAP and have low vapor pressures/high boiling points. Any dry material handling processes are either fully enclosed/closed loop or are mixed with wastewater in a manner that prevents the potential for exposure to the atmosphere in such a way that PM emissions could be generated. Negligible VOC emissions are expected from the units located within the WWTP due to the low volatility of the organic compounds present in the incoming wastewater streams. To demonstrate negligible VOC emissions are associated with the WWTP, Novelis has made an effort to conservatively quantify potential emissions from the sources most likely to contain the liquids with the highest organic concentrations within the WWTP processes that would represent the highest potential for the possibility of VOC formation. Novelis has identified the following process units with this highest VOC emissions generating potential as follows:1) two (2) Hot Mill Oil Tanks [WWTP – Hot Mill Oil Tanks (2); AS-43a], 2) one (1) Cold Mill Oil Tank [WWTP – Cold Mill Oil Tank; AS-43b], 3) one (1) Hot Mill Dissolved Air Flotation (DAF) Unit [WWTP – Hot Mill DAF; AS-43c], and 4) one (1) Cold Mill DAF Unit [WWTP – Cold Mill DAF; AS-46d].

3. PSD APPLICABILITY ASSESSMENT

Based on the project emission increase calculation methodologies detailed in **Table 3-1** and further detailed in **Appendix C**, the PSD applicability analysis for the as-built configuration of the Bay Minette project is presented below. **This analysis continues to demonstrate that the Bay Minette project will trigger PSD review for NO_X, CO, VOC, PM/PM_{10}/$PM_{2.5}$ and GHGs and will not trigger PSD permitting requirements for any other regulated NSR pollutants.**

3.1 PSD Source Classification

Novelis' Bay Minette Facility will be located in Baldwin County, which has been designated by the EPA as an unclassified/attainment area for all criteria pollutants. Therefore, with respect to the federal New Source Review permitting program, only PSD requirements could potentially apply to the source.

Alabama has adopted the requirements of the PSD permitting program into its State Implementation Plan (SIP) in ADEM Admin Code r. 335-3-14-.04.[2] These PSD regulations specifically define 28 industrial source categories for which the "major" source threshold is 100 tpy of any regulated pollutant.[3] The major source threshold for facilities not on this "List of 28" is 250 tpy. As discussed briefly in **Section 2.2**, the primary function of the Bay Minette facility is to produce aluminum sheet and plate from aluminum ingot. As such the Bay Minette facility is primarily classified under Source Industrial Code (SIC) 3353 (Aluminum Sheet, Plate, and Foil). However, since the Bay Minette facility could potentially be considered part of the "Secondary Metals Production Plant" source category, pending a determination on the source classification question by ADEM, the lower 100 tpy major source threshold for PSD permitting applicability analyses in this application could apply. Since the potential emissions of at least one regulated air pollutant currently exceeds both the lower 100 tpy "list of 28" major source threshold and the higher 250 tpy non-listed source category major source thresholds (e.g., PM, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, and GHGs), the Bay Minette facility will be classified as a new major source under the PSD program.

3.2 PSD Applicability Methodology

At a new major PSD source, PSD review is triggered for a regulated NSR pollutant if the potential emissions from the project under consideration are greater than the major source threshold for the regulated NSR pollutant. If PSD is triggered by any regulated NSR pollutant, then the facility is considered major for all regulated NSR pollutants and all the other applicable regulated NSR pollutant project emissions are compared to the applicable significant emission rates (SERs) defined under ADEM Admin Code r. 335-3-14-.04(2)(w) for a regulated NSR pollutant (refer to **Table 3-1**) using the "actual-to-potential test for projects that only involve construction of a new emissions unit(s)" from 335-3-14-.04(1)(g).

For projects involving increases in GHG emissions, the mechanism for triggering PSD review is different from other non-GHG regulated NSR pollutants. For a project to trigger PSD review for GHGs, GHGs must first become "subject to regulation" to be treated as a regulated NSR pollutant that can fall under the PSD requirements.[4] A physical change or change in the method of operation at a facility that results in an emissions increase of a non-GHG pollutant exceeding the major source threshold for new source and/or SER for major modifications that also causes an emissions increase of GHG exceeding 75,000 tpy CO_2e would make the GHG emissions increase from the project subject to regulation and would require PSD review for

[2] ADEM Admin Code r. 335-3-14-.04(1)(a).
[3] ADEM Admin Code r. 335-3-14-.04(2)(a)1.
[4] "Subject to regulation" is federally defined in 40 CFR 51.166(b)(48).

the GHG emissions from the new units associated with the project. Because the GHG emissions increase for the project exceeds 75,000 tpy CO_2e and PSD review is triggered for multiple non-GHG regulated NSR pollutants, the Bay Minette project is also subject to PSD review for GHG in addition to NO_X, CO, VOC, and $PM/PM_{10}/PM_{2.5}$.

3.3 Project Potential Emissions

For newly constructed emission units, annual emissions increases are calculated as the "sum of the potential to emit from each new emissions unit following the completion of the project."[5] Fugitive emissions are included in the annual emissions total for the PSD applicability determination.

For the PSD permitting program, "potential to emit (PTE)" is defined as the "maximum capacity of a stationary source to emit a pollutant under its physical or operational design."[6] Beyond the stated production capacity provided by the original equipment manufacturer, other factors considered when evaluating the potential production capabilities of new emission unit include the impact of inherent downtime in the production cycle, interdependence of operating variables that affect long-term capacity, and the effect of upstream/ downstream bottlenecks on the unit. Based on these considerations, hourly and annual potential process rates have been thoroughly defined for Bay Minette project sources. The relevant maximum annual process rate (i.e., aluminum throughput and natural gas usage rate) is then multiplied by a representative potential emission factor to determine the annual potential to emit used in the PSD applicability analysis. The emission increases for all affected emission units for the project are summed to deter the project emissions increase for each pollutant. The project emissions increase for each pollutant is then compared to the SER for the pollutant to determine if a significant emissions increase has occurred.

As shown in Table A-6 of **Appendix A**, Novelis has prepared a summary of all annual process rates which rely on an inherent process limitation and are not simply derived from assuming continuous operation (i.e., 8,760 hr/yr for annual operating hours) at the maximum hourly potential process rate. For Table A-6 entries specifically designated as being newly affected by the as-built changes, Novelis is proposing that federally enforceable operating limitations reflecting these annual process rates be added to the issued PSD construction permit for the project, where deemed necessary and appropriate by ADEM. Table A-6 also summarizes the existing operating limitations already reflected in the initial PSD permits for the sake of completeness and to demonstrate these operating limitations remain unchanged by the as-built updates carried in this application. No operating limitations are necessary for any hourly process rates contained in the potential emission calculations because these process rates reflect true unconstrained and unlimited hourly equipment capacities that cannot be exceeded in practice.

3.4 PSD Applicability Summary

As shown in **Table 3-1**, the potential emissions attributable to the project will exceed the major source thresholds and the SER for the following pollutants: PM, PM_{10}, $PM_{2.5}$, NO_X, CO, VOC, and GHG. The potential emissions from the project for SO_2 and lead are less than their respective SERs, so PSD permitting requirements do not apply to these pollutants. Based on this PSD applicability assessment, this permit action triggers PSD permitting requirements, including a BACT review and air quality modeling analyses, for PM, PM_{10}, $PM_{2.5}$, NO_X, CO, VOC, and GHG.

[5] ADEM Admin Code r. 335-3-14-.04(1)(i)
[6] ADEM Admin Code r. 335-3-14-.04(2)(d)

3.4.1 EPA Guidance on PSD Permit Revisions

Alabama's PSD regulations contain requirements for construction of a new major stationary source or the major modification of any existing major stationary source, but they do not specifically address the procedures required for revising an initial PSD permit determination solely on the basis of as-built changes. Therefore, Novelis has consulted EPA's operative guidance documents for clarifications on how the specific as-built changes addressed in this application can most effectively be handled from a PSD review perspective.

When the EPA initially promulgated the federal PSD regulations, EPA deferred any rulemaking or guidance on the topic of PSD "permit modifications". The federal PSD regulations do not specifically address the administrative permitting process and procedures applicable to design or operational changes to a previously permitted PSD source and the corresponding revisions to the application and permit that would be required to satisfy the PSD permitting requirements for any such changes. Rather, such changes necessitating a PSD permit revision were initially handled on a case-by-case basis by the EPA Regions and/or delegated state/local permitting authorities.

In July 1985, EPA published an initial guidance document entitled "PSD Permit Modifications: Policy Statement on Changes to a Source, a Permit Application, or an Issued Permit and on Extensions to Construction Schedules" to offer a new and less cumbersome and more consistent route for sources dealing with PSD source changes and corresponding PSD permit revisions.[7] Subsequent to this initial PSD permit modification guidance document, the Clean Air Act (CAA) Amendments of 1990 also did not specifically address the process to modify an already issued PSD permit covering source design and operating changes. However, in June 1991, EPA released an updated draft guidance document entitled "Guidance Document for Prevention of Significant Deterioration Permit Modifications" which contained similar elements to the July 1985 PSD permit modification guidance but with more specific details about the types of PSD permit changes, classification and review of changes, policies on circumvention, ambient impact changes and BACT changes.[8]

The two primary factors considered in EPA's PSD Permit Modification guidance document are:

1. Magnitude of the proposed changes within a hierarchy of administrative, minor, significant and fundamental changes, where each type of change is defined as follows:
    a. *Administrative Change* – No increase in either emissions or ambient impacts and no fundamental change in either the source or one of the emission units at the source.
    b. *Minor Change* – Changes requiring revisions to permit applications or issued permits and a certain amount of additional review and analysis, but do not constitute either a fundamental or significant change. Emissions or ambient impacts may increase as a result of minor changes, but not above the SER or significant impact levels (SIL).
    c. *Significant Change* – Changes with emissions increases resulting from the change exceeding the SER for one or more regulated NSR pollutants, but which do not constitute a fundamental change.

[7] EPA Memo from Darryl D. Tyler, Director Control Programs Development Division to EPA Regions I-X Air Division Directors, Revised Draft Policy on PSD Permit Modifications and Exemptions, July 5, 1985, available at Revised Draft Policy on Permit Modifications and Extensions

[8] EPA, Guidance Document for Prevention of Significant Deterioration Permit Modifications, Draft June 11, 1991.

d. *Fundamental Change* – Changes to the size, type or location of source or emission unit that are so essential (regardless of the net emissions or ambient impact differences) that the changed source or emission unit is considered a new source/emission unit and thus triggers a totally new PSD permit review process.

2. Stage of source development with the key differentiation being "pre-operational source" versus PSD sources already in operation.

   a. *Pre-Operational Sources* – Changes to applications or permits for sources not yet in operation would generally prompt a re-analysis of the project "as if the original application had been submitted in that form" (i.e., PSD re-analysis using the framework of the original PSD application for new/changed units).

   b. *PSD Sources Already in Operation* – Changes to sources with already issued PSD permits that are in operation are generally treated the same as applications to change any existing stationary source (i.e., applying the major modification definition to the new, modified and otherwise impacted units). However, if the change should reasonably have been part of the initial project rather than a separate project, the change should be evaluated as part of a "new total source impact" rather than as part of a separate permit action. In this instance of a change aggregated back to the original PSD permit action, the permit revision process otherwise applicable to pre-operational sources should be followed.

In the context of this PSD permit modification framework, Novelis' Bay Minette facility as-built changes can reasonably be defined as minor changes at a soon to be operational PSD source which are substantially related to the original PSD permit action. Therefore, the next step of the PSD permit modification procedure is selecting the applicable "level of review" from among the following options:

1. *Amendment* – Administrative application or permit changes which result in no increase in either emissions or the ambient air quality impact of a PSD source. Nature and size of source cannot be altered to the extent of a fundamental change.

2. *Revision* – Review level required for the large majority of minor and significant changes at operating major stationary sources which do not qualify as major modifications or as fundamental changes. Revision review would focus on only that portion of the source immediately involved in the proposed change, rather than all of those units previously reviewed. Revisions are exempted from any new PSD requirements that were added between the time of the original permit issuance and the submission of the application covering the proposed changes as long as the source had commenced construction prior to the adoption of the new PSD requirement and had met its original PSD permit conditions. Finally, the applicant for a revision retains the PSD Increment rights afforded by the original application or permit.

3. *Major Modification* – Operating sources which propose changes that constitute a "major modification" (within the meaning of this term in the applicable PSD permitting program) would pursue PSD review in an analogous manner to a new source (see "New Permit" option below), but with the focus of the PSD review being only on the modification itself and not the entire existing source. Also, operational existing sources proposing changes which are related to and should have been covered in the original PSD permit action would need to pursue these changes as a revision. For sources not yet operating, changes which would otherwise qualify as major modifications would be treated as a Revision under Item 2 above.

4. *New Permit* – Three types of changes can require a separate new application for issuance of a new PSD permit: 1) changes affecting the fundamental nature of the source, 2) significant changes in the size of a permitted emission unit or source (e.g., increasing the output capacity of a source by 50%

from the original PSD permit basis), and 3) change in the location of a stationary source with the new proposed location being considered no longer contiguous or adjacent to the original location/property.

The Novelis Bay Minette as-built changes covered in this permit action do not constitute a source-wide emissions increase as documented in the "As-Permitted to As-Built Casting Expansion Project Potential Emissions Change" column of **Table 3-1** for any regulated air pollutant other than VOC. If the corrected annual emissions for the Tandem Cold Mill (CR-01) are excluded from the as-permitted to as-built source-wide potential emissions comparison, the as-built changes also do not constitute a major modification for VOC emissions (i.e., difference in as-permitted potential emissions from as-built potential emissions would fall below the 40 tpy SER). In addition, the as-built changes do not comprise any of the fundamental changes to the casting expansion project scope that would require a new PSD permit. Finally, the as-built changes do involve nominal changes in regulated NSR pollutant emissions and associated ambient air quality impacts, so these as-built changes cannot be addressed solely via an administrative change to the PSD permit. Therefore, the as-built changes are best characterized as qualifying as a PSD permit revision.

Under EPA's "Guide to Processing PSD Permit Modifications" within the June 1991 PSD Permit Modification guidance document, a minor change requiring a permit revision at a source that has been issued a PSD permit but has yet to begin operation would be subject to repeat or screening level PSD review process. In this manner, Novelis considers Item 3.B. of EPA's Guide to Processing PSD Permit Modifications to be the most applicable scenario to the current as-built changes. This PSD permit modification approach requires the following PSD review elements and permitting procedures:

- Revise PSD permit to reflect changes,
- Screen review decisions from original PSD permit determination and repeat or add reviews as needed,
- Repeat public participation,
- Original increment is preserved,
- Additional increment allocations are based on the date that the proposed change was submitted,
- Source or emission unit as originally permitted can begin operation, but changed source or emission unit cannot construct until revised permit is issued,
  - Novelis will work in close coordination with ADEM regarding the construction authorization and operational authority considerations for the changed sources and new as-built emission units carried in this application to ensure proper authorizations are obtained in a timely manner.
- Change is not subject to new PSD rules if construction on the original source or emission unit has commenced.

Although Novelis recognizes that EPA's PSD permit modification guidance was never issued as a final document or promulgated in an update to the federal PSD regulations, the framework contained in this document best represents EPA's perspectives and policies on how a PSD permit revision can be pursued for an operational source. Novelis' approach of completing a screening level review for all of the same PSD review elements for the affected units addressed in this as-built significant permit revision that would have otherwise applied if they had been carried in the initial application package represents the most robust and conservative application of EPA's potentially applicable guidance on the topic.

Table 3-1. Proposed Project Potential Emissions (As-Permitted to As-Built)

Pollutant	As-Permitted Project Potential Emissions[a] (tpy)	PSD Significant Emission Rate[b] (tpy)	Project Triggers PSD Review? (Yes/No)	As-Built Project Potential Emissions (tpy)	As-Perm. to As-Built Project Potential Emissions Change[d] (tpy)
PM	249.62	25	**Yes**	246.94	-2.68
PM_{10}	384.85	15	**Yes**	383.22	-1.63
$PM_{2.5}$	326.34	10	**Yes**	326.06	-0.28
NO_X	723.81	40	**Yes**	698.62	-25.19
CO	666.62	100	**Yes**	605.54	-61.08
VOC[d]	617.26	40	**Yes**	664.73	47.47
SO_2	2.94	40	**No**	2.63	-0.30
Lead	1.27E-02	0.6	**No**	1.16E-02	-1.11E-03
GHG (as CO_2e)[c]	726,601	75,000	**Yes**	660,908	-65,693

a. PM_{10} and $PM_{2.5}$ source-wide potential emissions from initial PSD permit action in Table 1-1 of Appendix C and Table 3-1 contained an error in the Paved Haul Roads (AS-25) PM_{10} and $PM_{2.5}$ potential emissions contribution which has been corrected in this updated Table 3-1 and Table 1-1.2 of Appendix C.
b. ADEM Admin Code r. 335-3-14-.04 (2)(w).
c. For a project that causes a 75,000 tpy increase in CO_2e emissions and an increase above the SER for a non-GHG pollutant, GHGs become subject to regulation and are treated as a regulated NSR pollutant with a PSD Significant Emission Rate of 0 tpy.
d. The as-built annual potential VOC emissions exceed the as-permitted annual potential VOC emissions by an amount greater than the PSD Significant Emission Rate, so Novelis has prepared an updated Ozone Ambient Impact Analysis in Section 6 of the as-built modeling report. The vast majority of this VOC emissions change is due to an administrative update to the Tandem Cold Mill (CR-01) annual potential VOC emissions, which contributes approximately 31.5 tpy of the as-permitted versus as-built VOC emissions change such that the adjusted difference of approximately 14.4 tpy VOC would not otherwise exceed the PSD SER.

4. SCRAP PROCESSING AREA CHANGES

4.1 Process Equipment Changes

With the exception of removing the Scrap Processing Line #4 (LIBS Line) and its associated Cold Baghouse from the project scope, no other primary process equipment changes within the Scrap Processing Area with the potential to affect the regulated air pollutant emission profile of the Scrap Processing area sources have occurred with the as-built changes. As shown in Section 2 of **Appendix C**, maximum hourly process rates have been reconciled to the final design specifications for the selected process equipment.

4.2 Control Device Changes

Each of the Scrap Processing and Sorting Lines in the Scrap Processing Area will continue to be served by dedicated Cold Baghouses with no substantive changes in the associated engineering design basis and planned operating practices for these PM emissions control devices. However, the flow capacity of the remaining Cold Baghouses have changed slightly (<1%) for Cold Baghouses #1, #2, and #4 and more substantively (27%) for Cold Baghouse #3 serving the Scrap Processing Line #3 (CBS Line – Class 1 & 3), while the design aluminum production capacity for Scrap Processing Line #3 increased by a lower proportion than the associated baghouse's flow capacity. The Cold Baghouse #3 flow capacity increased from 94,990 dscfm in the as-permitted configuration to 120,800 dscfm in the as-built configuration comprising an approximately 25,000 dscfm flow capacity increase.

4.3 Air Emissions Changes

Relative to the total Cold Baghouse flow capacity across all units (870,840 dscfm) and the removal of the prior Cold Baghouse #4 serving the now removed Scrap Processing Line #4 (LIBS Line) (80,385 dscfm), the relatively minor change in the Cold Baghouse #3 flow capacity does not result in an overall PM/PM_{10}/$PM_{2.5}$ emissions increase for the Scrap Processing Area. In fact, as shown in Table 1-1.3 of **Appendix C**, the cumulative as-built Scrap Processing Area annual potential emission rates for PM/PM_{10}/$PM_{2.5}$ are less than the as-permitted configuration. All other emission calculation parameters for the Scrap Processing and Sorting Lines remain unchanged demonstrating the minor nature of all process equipment and control device design changes between the as-permitted and as-built configuration.

4.4 Suggested PSD Permit Changes

Novelis has initially reviewed the existing applicable PSD permits associated with the Scrap Processing Area and has identified the following suggested permit changes to accommodate the as-built configuration of the Bay Minette facility:

- Remove all references to Scrap Processing Line #4 (SP-04) and associated Cold Baghouse #4 from X001 permit.
- Replace all instances of Cold Baghouse #5 (CBH5) serving Scrap Sorting Line #1 (SP-05) with Cold Baghouse #4 (CBH4) to reflect the removal of the Scrap Processing Line #4 and its associated baghouse and to reflect Novelis' desire for all of the Cold Baghouses in the Scrap Processing Area to be designated with a sequential numbering system reflected in the as-built engineering design basis.
- Update all PM/PM_{10}/$PM_{2.5}$ hourly BACT limits (lb/hr) as indicated in the summary table in **Appendix A**.

- Update all aluminum production rate normalized (lb/ton) $PM/PM_{10}/PM_{2.5}$ emission limits established by ADEM as supporting limits for Novelis' currently permitted and proposed BACT limits based on the emission factors referenced in Section 2 of **Appendix C**.

4.5 BACT Determination Updates

The top-down BACT analyses presented in **Sections 6.1.1, 6.1.2, 6.1.3, 6.1.4, and 6.1.5** of the original PSD application continues to apply to the as-built configuration of the Scrap Processing Area with no necessary changes or updates to reflect the relatively minor changes to equipment process rates and baghouse flow capacities. The associated grain-loading design basis (0.002 gr/dscf) for the proposed baghouse controls serving the Scrap Processing and Sorting Lines remains unchanged and is more stringent than the Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Reduction (LAER) Clearinghouse (RBLC) database entries identified in **Appendix F** of the original PSD application as BACT for similar operations. Novelis has confirmed that no more recent RBLC entries for the secondary aluminum sector meeting the original search criteria noted in Section 3 of **Appendix F** of the original PSD application have been posted, and thus, Novelis' proposed BACT limits after the as-built changes continue to reflect the most stringent Scrap Processing equipment $PM/PM_{10}/PM_{2.5}$ BACT determinations for similar operations.

4.6 Air Quality Analysis Updates

As shown in the "plot plan" (looking down) views in **Figure 4-1** and 3D/elevation views in 3D/elevation (looking across) views in **Figure 4-2**, the primary as-built changes for the Scrap Processing area with the potential to influence the air quality analysis include the following items. Refer to **Appendix A-1** for the overlayed building layout for the as-permitted and as-built Scrap Processing area configurations:

- Scrap Processing Line #4 (LIBS Line) (Model ID = SPL4) and the associated Cold Baghouse #5 have been removed from the project scope.
  - The reduction in $PM_{10}/PM_{2.5}$ modeled emission rates from the removal of SPL4 (0.70 lb PM_{10}/hr and 0.21 lb $PM_{2.5}$/hr) is expected to offset any potential modeled $PM_{10}/PM_{2.5}$ emission rate increase from the Cold Baghouse #3 flow capacity increase impacting the nearby Scrap Processing Line #3 (CBS Line – Class 1 & 3) (SPL3) stack (0.23 lb PM_{10}/hr and 0.07 lb $PM_{2.5}$/hr).
- Main Scrap Processing Building (SCRPPROC) location shifted approximately 20 feet to the northwest with a slightly taller maximum roof height (73.5 ft in as-permitted vs. 79.5 ft in as-built or a relatively small 8% increase).
  - Relative position of Scrap Processing Area Cold Baghouse stacks in the as-built configuration remains no closer to the edge of the building as the original/as-permitted configuration and falls in the same general north-south configuration. Regardless, the as-permitted and as-built locations of the Cold Baghouse stacks are not subject to the influence of downwash.
- Dross Storage Building (DROSS) location carries a similar shift as the main Scrap Processing Building, but also contains an extension for the Sow Dryer area and a lower tier support building in the southwest corner. The as-built maximum roof height for the Dross Storage Building (50.2 ft) is slightly lower than the as-permitted maximum roof height (52.2 ft).
  - The Cold Baghouse stacks are not subject to the influence of downwash.
- Four additional support buildings (BLDG01 and BLDG25 on the southwest corner of main Scrap Processing Building, BLDG02 on the southwest corner of Dross Storage Building, and BLDG31 on east

side of main Scrap Processing Building) with lower maximum roof heights (ranging from 16 to 38.6 ft) have been added to the as-built configuration of the Bay Minette facility.

  - Lower tier buildings will not affect the downwash parameters for the Cold Baghouse stacks because the as-permitted and as-built locations of these stacks are not subject to the influence of downwash.

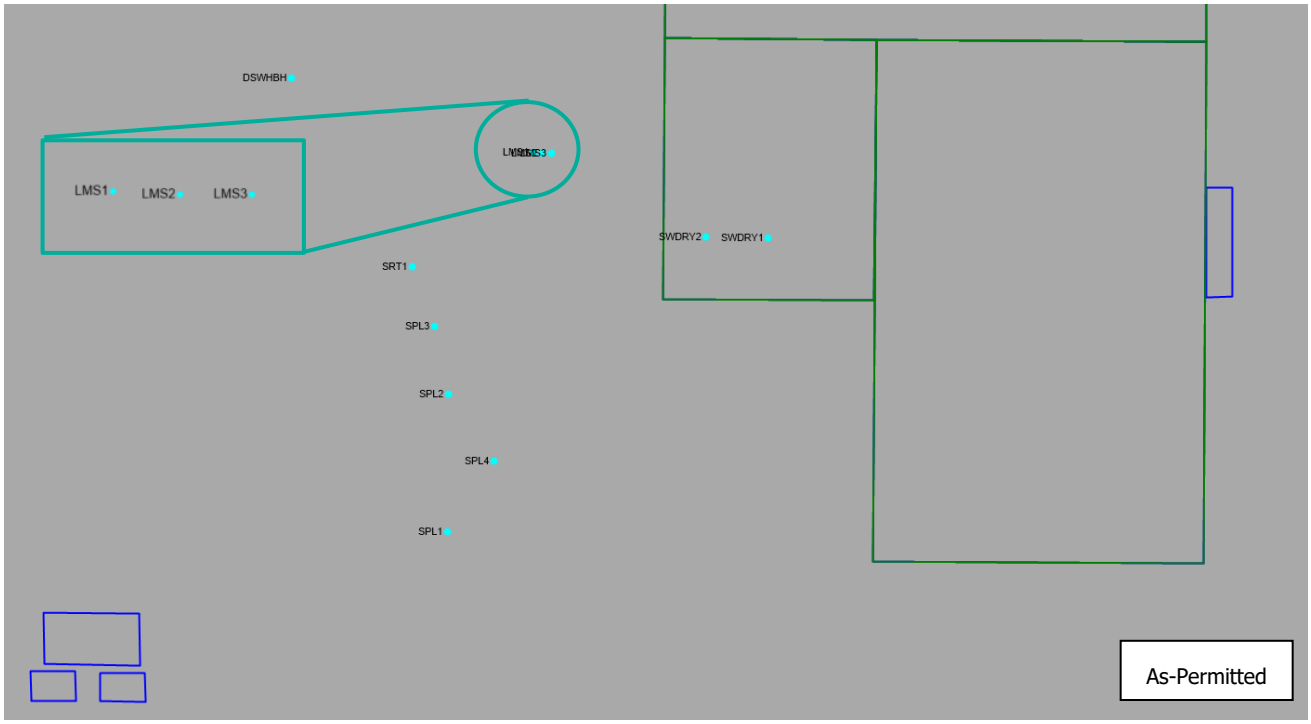
- South to north arrangement of the Cold Baghouses changed (SPL1/CBH1, SPL4/CBH4, SPL2/CBH2, SPL3/CBH3, and SRT1/CBH5 for as-permitted to SPL2/CBH2, SPL1/CBH1, SPL3/CBH3, and SRT1/CBH4 for as-built), and three of the four remaining Cold Baghouse (SPL1/CBH1, SPL2/CBH2, and SPL3/CBH3) shifted further from the main Scrap Processing Building (by between approximately 20 and 100 ft).

  - The location occupied by the Cold Baghouses is bounded by a relatively small area in both the as-permitted and as-built configuration.

  - The stack shift further from the main Scrap Processing Building will have no effect on downwash parameters as these stacks are not subject to the influence of building downwash.

- As shown in **Table 4-1** and **Table 4-2**, the as-permitted and as-built stack parameters for the Cold Baghouse stacks are largely the same with only small changes to stack exhaust flow rate, diameter, and associated exit velocities. The 120 ft stack height determined by the original PSD modeling analysis was retained in the as-built engineering design basis.

Figure 4-1. Scrap Processing Area As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View)



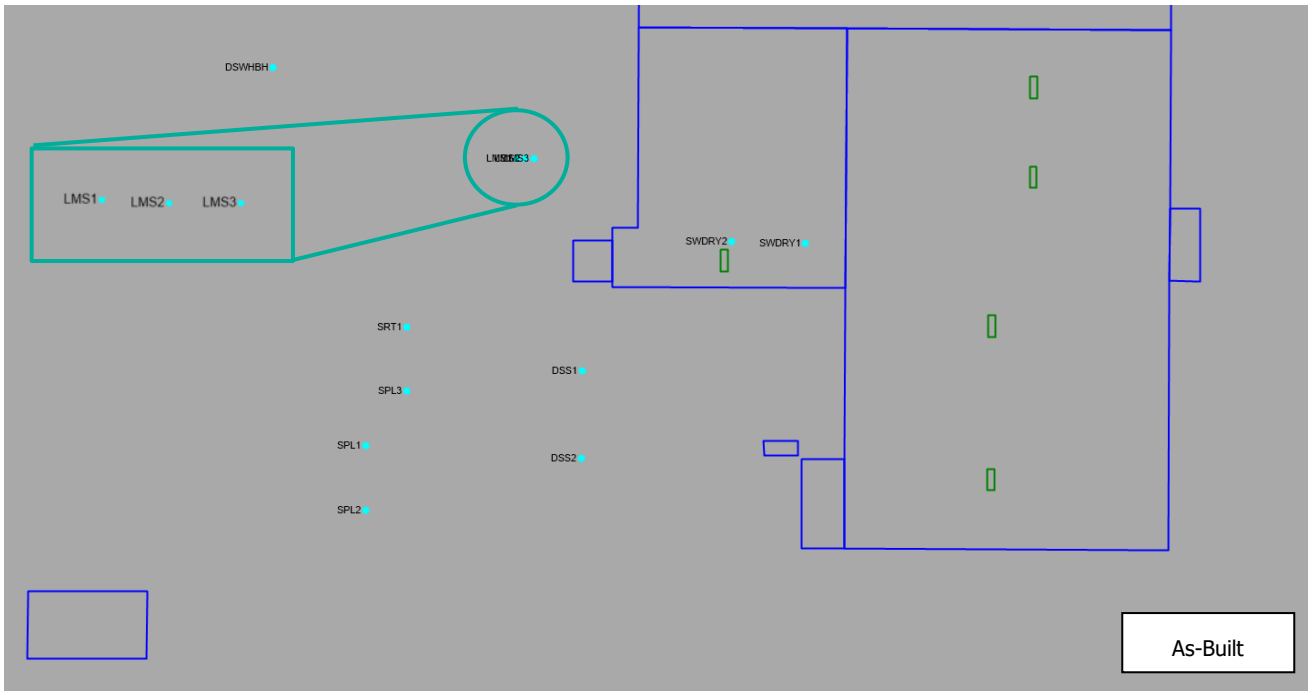


Figure 4-2. Scrap Processing Area As-Permitted vs. As-Built Modeling Setup Comparison (3D/Elevation View)

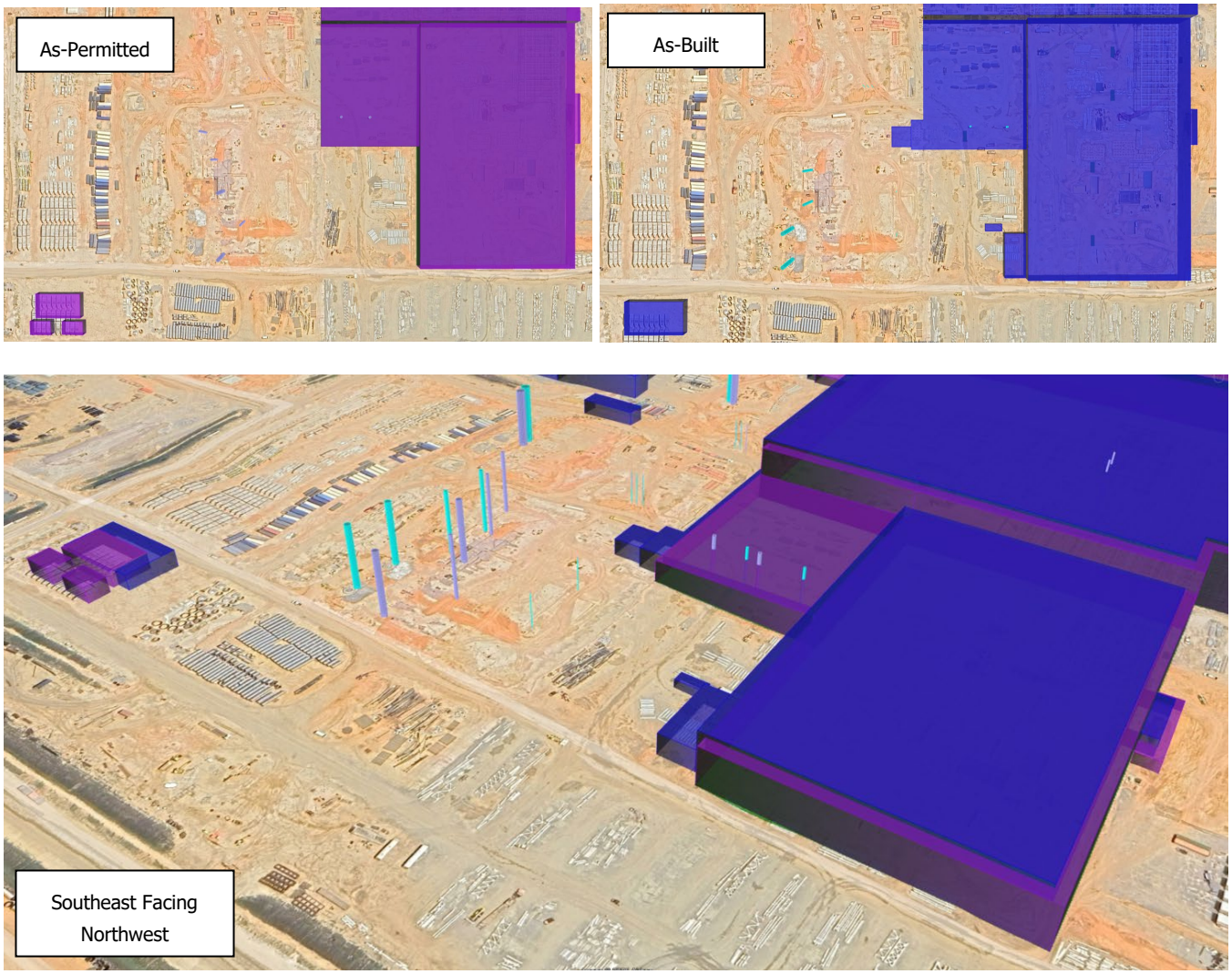


Table 4-1. As-Permitted Modeling Input Parameters for Scrap Processing Area Point Sources

Model ID	Emission Point Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
SPL1	Cold Baghouse #1 Stack	428,966.67	3,423,982.22	270.0	V	120.0	80.0	330,855	63.7	10.50
SPL2	Cold Baghouse #2 Stack	428,966.98	3,424,040.49	270.0	V	120.0	80.0	310,040	63.7	10.16
SPL3	Cold Baghouse #3 Stack	428,961.21	3,424,069.50	270.0	V	120.0	80.0	94,990	63.7	5.63
SPL4	Cold Baghouse #4 Stack	428,986.17	3,424,012.41	270.0	V	120.0	80.0	80,385	50.1	5.83
SRT1	Cold Baghouse #5 Stack	428,951.38	3,424,094.38	270.0	V	120.0	80.0	110,630	63.7	6.07

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment. A 0 deg. F temperature is used to flag an ambient release (based on inputting 0 K to AERMOD to trigger this option). A -10 deg. F temperature is assigned to represent a cooling tower release temperature that is 10 deg. F below ambient temperature.

Table 4-2. As-Built Modeling Input Parameters for Scrap Processing Area Point Sources

Model ID	Emission Point Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
SPL1	Cold Baghouse #1 Stack	**428,938.43**	**3,424,019.94**	270.0	V	120.0	80.0	**330,000**	**64.5**	**10.42**
SPL2	Cold Baghouse #2 Stack	**428,938.30**	**3,423,992.49**	270.0	V	120.0	80.0	310,040	**60.6**	**10.42**
SPL3	Cold Baghouse #3 Stack	**428,955.81**	**3,424,043.40**	270.0	V	120.0	80.0	**120,800**	**63.9**	**6.33**
SRT1	Cold Baghouse #4 Stack	**428,955.93**	**3,424,070.84**	270.0	V	120.0	80.0	**110,000**	**58.2**	**6.33**

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment. A 0 deg. F temperature is used to flag an ambient release (based on inputting 0 K to AERMOD to trigger this option). A -10 deg. F temperature is assigned to represent a cooling tower release temperature that is 10 deg. F below ambient temperature.

5. MELTING & CASTING AREA CHANGES

5.1 Process Equipment Changes

5.1.1 Updates to As-Permitted Process Equipment Specifications

Updates to process equipment specifications relevant to the air permitting process are documented in the annotated versions of the potential emission calculations for the three (3) Decoaters (Section 3), five (5) Sidewell Melting Furnaces (Section 4), NDC Recycle Furnace (Section 5), two (2) Round Top Furnaces (Section 6), four (4) Holding Furnaces (Section 7), four (4) In-Line Degassers (Section 8), two (2) Sow Dryers (Section 9), Dross House (Section 10), two (2) Dross Presses (Section 11), and support operations (Sections 12 and 13) comprising the Melting and Casting process area and presented in **Appendix C**. The key as-built changes affecting process equipment in the Melting and Casting area can be summarized as follows:

- Small maximum hourly throughput decrease (~9%) for Decoaters #1-#3 (from 30.3 ton/hr in as-permitted configuration to 27.6 ton/hr in the as-built configuration) for the controlling process rate associated with the Decoating Mode of operation to reconcile to the final vendor-supplied equipment specifications for the as-installed units.
- Increase in the maximum hourly throughput for the Drying Mode of operation (from 38.6 ton/hr in the as-permitted configuration to 73.2 ton/hr in the as-built configuration) presented solely as a reference due to this mode of operation not defining the maximum potential or worst-case emissions from the Decoaters.
- Very small increase (0.2 MMBtu/hr or <1%) in the maximum burner heat input capacity for the Decoaters to reconcile with as-built equipment specifications from the vendor.
- Moderate increase (~14%) in the maximum hourly aluminum throughput for the NDC Recycle Furnace (from 24.3 ton/hr in as-permitted configuration to 27.6 ton/hr in as-built configuration) to reconcile with as-built equipment specifications from the vendor.
  - This maximum hourly throughput change for the NDC Recycle Furnace only impacts potential emissions for pollutants calculated using a reference aluminum process rate-based emission factor (lb/ton) as documented in Section 5.3.1 of **Appendix C** (i.e., NO_X, CO, VOC, CO_2, and HAP and not PM/PM_{10}/$PM_{2.5}$).
- Moderate decrease (~10%) in maximum burner heat input capacity for the NDC Recycle Furnace (from 65.4 MMBtu/hr in the as permitted configuration to 59.3 MMBtu/hr in the as-built configuration) to reconcile with as-built equipment specifications from the vendor.
  - This maximum hourly burner heat input capacity change for the NDC Recycle Furnace only impacts potential emissions for pollutants with a contribution tied to natural gas combustion (lb/MMscf) as documented in Section 5.3.2 of **Appendix C** (i.e., NO_X, CO, VOC, SO_2, GHG, and HAP and not PM/PM_{10}/$PM_{2.5}$).
- Small decrease (~3%) in maximum burner heat input capacity for the Round Top Furnaces (from 115 MMBtu/hr in the as-permitted configuration to 112 MMBtu/hr in the as-built configuration) to reconcile with as-built equipment specifications from the vendor. Similar to the burner rating change for the NDC Recycle Furnace, this as-built change to the Round Top combustion system specifications only impacts pollutants with an emissions contribution tied to natural gas combustion (lb/MMscf).

- To ensure a balanced configuration between the melting furnaces and casting process and to reflect the addition of a second casting pit serving the Flex Line, Novelis made updates to the Holding Furnace maximum hourly process rates for the Flex Line (from 41.9 ton/hr in the as-permitted configuration to 61.2 ton/hr in the as-built configuration representing a 46% increase) and the CBS Line (from 50.5 ton/hr in the as-permitted configuration to 59.5 ton/hr in the as-built configuration representing a 18% increase).
  - This maximum hourly throughput change for the Holding Furnaces only impacts potential emissions for pollutants calculated using a reference aluminum process rate-based emission factor (lb/ton) as documented in Sections 7.3.1 through 7.3.4 of **Appendix C** (i.e., only for VOC and HAP and not $PM/PM_{10}/PM_{2.5}$ or any of the remaining regulated NSR pollutants tied solely to natural gas combustion).
- Moderate decrease (~10%) in maximum burner heat input capacity for the NDC Recycle Furnace (from 65.4 MMBtu/hr in the as permitted configuration to 59.3 MMBtu/hr in the as-built configuration) to reconcile with as-built equipment specifications from the vendor.
  - This maximum hourly burner heat input capacity change for the Holding Furnaces only impacts potential emissions for pollutants with a contribution tied to natural gas combustion (lb/MMscf) as documented in Sections 7.3.5 and 7.3.6 of **Appendix C** (i.e., for NO_X, CO, SO_2, GHG, and HAP and not $PM/PM_{10}/PM_{2.5}$ or VOC).
- Maximum hourly aluminum throughput for the In-Line Degassers was reconciled to match the maximum process rate assigned to casting pits during the batch casting cycle which is expected to extend beyond the 1-hour timeframe defining the maximum hourly process rate. This new maximum hourly throughput for the as-built configuration of the In-Line Degassers (109.1 ton/hr) cannot be sustained due to upstream inherent process limitations imposed by the equipment capabilities of the melting and holding furnaces. Therefore, the maximum annual throughput assigned to each In-Line Degasser (535,921 tpy) is set equal to the maximum annual throughput for the associated Holding Furnace.
- There was a significant increase (~64%) in maximum hourly aluminum throughput and corresponding maximum burner heat input capacity increase (~50%) for the identical Sow Dryer #1 (Flex Line) and Sow Dryer #2 (CBS Line). The maximum hourly aluminum throughput (15.90 ton/hr in as-permitted configuration and 26.01 ton/hr in as-built configuration) increased to accommodate the preheated sow demands of the melting processes on each production line and to reconcile with as-built equipment specifications from the vendor. The maximum burner heat input capacity is a function of the aluminum batch size and associated aluminum throughput rate, so a corresponding increase in the burner heat input rating from 20 MMBtu/hr in the as-permitted configuration to 30 MMBtu/hr in the as-built configuration is also reflected in the Sow Dryer potential emission calculations (refer to Section 9 of **Appendix C**).
  - Sow Dryer potential emissions are exclusively tied to natural gas combustion, so the maximum hourly burner heat input capacity change results in a corresponding calculated increase in maximum hourly potential emissions. However, based on the batch nature and operating profile of how the Sow Dryers are utilized during the typical sow preheating cycle, the maximum hourly burner heat input is only used for brief periods (typically less than 1 hour). Sow Dryers operate with initial sustained high firing rates for the initial phase of the dryer cycle to reach target temperature and then cycle from high fire to low fire (idle) to maintain the temperature target profile to properly homogenize the multiple stacks of sows in the dryer. Therefore, Novelis is proposing a new annual operating limitation on Sow Dryer natural gas usage (175.2 MMscf/yr for each Sow Dryer) to ensure that the as-built maximum hourly burner heat input capacity change does not translate into a calculated maximum annual potential emissions increase for the Sow Dryers. This proposed annual operating

limitation is presented in Table A-6 of **Appendix A** to represent a complete list of source-wide annual operating limitations to be reflected in the revised PSD permits for the Bay Minette facility.

- Small increase (~7%) in the Dross House maximum hourly dross throughput (from 10.17 ton/hr in as-permitted configuration to 10.87 ton/hr in as-built configuration) to reconcile with the maximum hourly throughputs of the dross generating equipment in the Melting and Casting area based on the worst-case dross yields (lb dross/lb aluminum throughput) assigned to each unit.
- Significant decrease (~47%) in the Dross Press maximum hourly aluminum throughput (from 13.6 ton/hr in as-permitted configuration to 7.2 ton/hr in the as-built configuration) to reconcile with the final engineering design and operating details for the batch dross press operating cycle provided by the vendor.
  - The dross process rate for the Dross Presses is not used directly in the quantification of potential $PM/PM_{10}/PM_{2.5}$ emissions, so this change in throughput only affects the calculation of the aluminum process rate normalized emission factors.
- The Casting Process Emissions Sources have been updated to reflect installation of the fourth casting pit (second casting pit on the Flex Line) and to make all casting lines carry the same configuration of metal filtration equipment including a CFF and DBF with associated natural gas-fired preheating system on each casting line. The maximum hourly burner heat input capacity of the small CFF and BDF preheaters has been reconciled with as-built equipment specifications from the vendor. Finally, the maximum hourly lubricant usage for the casting lines has been scaled up from the as-permitted configuration with three casting lines to the as-built configuration with four casting lines based on operating experience from similar casting processes and worst-case estimates for short-term lubricant usage.
- The Ingot Saw in the Melting and Casting area has been redesignated from a unit with the capability to function as a continuously operating production unit with a high short-term throughput capability to a non-routine process used solely for material handling of reject ingots. Therefore, the maximum hourly number of ingots processed and associated maximum hourly ingot processing rate have been significantly reduced from the as-permitted to the as-built configuration. On a long-term basis, the maximum annual ingot processing capacity of the Melting & Casting Ingot Saw remains as 3% of the maximum hourly ingot rolling capacity based on a worst-case estimate for the amount of reject ingots produced by the casting and rolling processes at the Bay Minette Facility.
  - Similar to the relationship between process rates and potential emissions applicable to the Dross Presses, the change in maximum hourly aluminum throughput does not directly translate into a change in the maximum hourly potential emissions because these hourly potential emissions are derived based on other variables not tied to aluminum throughput. However, the aluminum process rate normalized emission factors do change which results in a small change in the maximum annual potential emissions of $PM/PM_{10}/PM_{2.5}$ and VOC from the Melting & Casting Ingot Saw.

5.1.2 Changes to Emission Unit Naming Conventions

As shown in the Emission Unit Index provided in **Appendix A**, the numbering of the Decoaters, melting furnaces, Holding Furnaces, In-Line Degassers, Sow Dryers, Dross Presses, and casting process sources have been updated from the as-permitting naming conventions to a preferred as-built naming convention based on Novelis' internal work breakdown structure (WBS) designations used for the Melting and Casting Area process equipment. Effectively, the lower numbers are now assigned to the CBS Line on the east side of the Melting and Casting Area and sequential numbering, within a production line, increases moving from east-to-west and north-to-south. The preliminary equipment naming convention used in the original PSD application effectively used in the inverse number scheme with the Flex Line on the west side of the facility getting the lower numbers, and equipment numbering, within a production line, increasing when moving

from west-to-east and from south-to-north. Novelis requests that all of the formal emission unit names assigned to the Melting and Casting area in the Emission Unit Index be carried into the revised PSD permits for the Bay Minette facility.

5.1.3 Removal of As-Permitted Equipment

As shown with the gray highlights and strikethrough text on the Emission Unit Index in **Appendix A**, Novelis has removed the following equipment from the project scope:

- Removal of second dross press on each of the Flex Line and CBS Line [original Dross Press #2 (Flex Line) (MC-23) and Dross Press #4 (CBS Line) (MC-24)]
- Removal of natural gas-fired Trough Heaters on the Flex Line and CBS Line (MC-29 and MC-30) and replacement with electrically heated troughs that do not generate regulated air pollutant emissions

5.1.4 Addition of New Emission Units

As shown in the full rows of light green highlights and dark red text on the Emission Unit Index in **Appendix A**, the entirely new emission unit designations for the Melting and Casting area consist of the following:

- Addition of a second In-Line Degasser to the Flex Line [In-Line Degasser #3 (Flex Line) (MC-33)] to correspond with the new casting pit arrangement involving dedicated holding furnaces, in-line degassers, and CFF/DBF metal filtration units on each of the four casting lines with a now identical arrangement in the as-built configuration
- Addition of a new set of CFF/DBF preheaters [CFF & DBF System for DC3 (Flex Line) (MC-34)] on the second casting unit in the Flex Line
- Addition of small natural gas-fired Molten Metal Utility Heaters (MC-35) for managing molten metal flow in the Melting and Casting area

5.2 Control Device Changes

5.2.1 Hot Baghouse Changes

The overall number (9) and connections to types of emission units for the Hot Baghouses has not changed from the as-permitted to as-built configuration. However, the annotations in the Emission Unit Index in **Appendix A** show how the Hot Baghouses #6 to #9 with one melting furnace and one holding furnace have a different configuration from the as-permitted arrangement. With the Holding Furnaces #1-#4 all having a nominally equivalent engineering design and operating profile, these as-built changes do not represent a substantive update to the engineering design basis of the affected Hot Baghouses #6 to #9.

Similar to the situation with the Cold Baghouses in the Scrap Processing Area, minor updates (<10% increases and decreases) have been made to the actual volumetric flow capacity of all of the Hot Baghouses as reflected in Sections 3 through 7 of **Appendix C** to reconcile with as-built equipment specifications from the vendor. In addition, adjustments to the nominal stack temperature and minimum nominal moisture content used in the derivation of the dry standard volumetric flow rate (dscfm) for the Hot Baghouses have been made to reflect the final engineering design basis for the associated capture and collection systems and engineering estimates for the expected properties of the collected exhaust streams. As shown in Table 1-1.3 of **Appendix C**, these as-built updates to the engineering design and operating specifications of the

Hot Baghouse lead to relatively small changes in filterable PM emission rates (<1 tpy increases and decreases on an individual unit basis within a total annual potential emission rate for Hot Baghouse associated units of more than 83 tpy) as compared to the as-permitted configuration.

5.2.2 Dross Press Control Configuration Change

As documented in Section 11.2.1 of **Appendix C** in the original PSD application, Novelis had originally planned to route the uncontrolled discharge from the four Dross Presses into either Hot Baghouse #2 or #3. In the final refined, as-built configuration, Novelis now plans to install integral filtration units which are equipped with exhaust ducts discharging directly into the Melting and Casting area production building. These integral filtration units are expected to achieve an adequately low filterable PM emissions performance (0.01 gr/dscf) especially given their low volumetric flow rates and intermittent use in accordance with an as-needed, batch operating cycle dependent on the Bay Minette facility's dross management needs at any given operating timeframe. The annual potential PM emissions change from each individual Dross Press associated with this control configuration update is only 0.62 tpy of filterable PM. On an overall basis, the two (2) remaining Dross Presses in the as-built configuration will only produce approximately 1 tpy of filterable PM on an annual potential basis more than the as-permitted four (4) Dross Presses, which is a negligible filterable PM emissions differential in comparison to the process area-wide emissions total of more than 95 tpy of filterable PM.

5.3 Air Emissions Changes

As summarized in Table 1-1.3 of **Appendix C**, the various cumulative as-built changes to the Melting and Casting process area produce relatively small annual potential emissions increases for some regulated pollutants (+4.7 tpy and +5% for PM; +5.9 tpy and +1% for NO_X; +6.8 tpy and +3% for VOC; negligible change for SO_2; and +5.3 tpy and +2% for total HAP) and small decreases for other pollutants (-14.1 tpy and -3% for CO; -3,300 tpy GHG and -0.6%) due to offsetting impacts of the various equipment specification and emission factor updates across the collection of emission units comprising the Melting and Casting process area. The following sections provide more detailed summaries of the substantive potential emission calculations changes for the Melting and Casting process area as a supplement to the overall summary provided in Section 1 of **Appendix C**.

5.3.1 Decoater Air Emissions Quantification

As documented in Section 3 of **Appendix C**, the changes to the aluminum throughput rates and baghouse flow capacity and assumed operating conditions contribute to relatively small changes in regulated NSR pollutant and HAP emission rates from the Decoaters between the as-permitted and as-built configurations as summarized in Table 1-1.3 of **Appendix C**. Filterable PM emissions increase in the as-built configuration by a very small amount (<2%) mainly due to the change in Hot Baghouse flow capacities expressed on a dry standard volumetric flow rate basis (dscfm). The total PM_{10}, total $PM_{2.5}$, NO_X, CO, VOC, GHG, and total HAP annual potential emission rates from the Decoaters in the as-built configuration decrease by a small amount (<10%) due to the reduction in design aluminum throughput. Otherwise, the emission factors applied and all other aspects of the regulated NSR pollutant and HAP emission calculation methodology for the Decoaters is identical between the original PSD application and this as-built reconciliation application.

5.3.2 Sidewell Melting Furnace Air Emissions Quantification

As documented in Section 4 and summarized in Table 1-1.3 of **Appendix C**, the very small change in Hot Baghouse #4 and #5 flow capacities (<2% on a dscfm basis) produce corresponding reductions in the filterable PM emissions from Sidewell Melting Furnaces #1 and #2 on the CBS Line and Sidewell Melting

Furnaces #4 and #5 on the Flex Line. Due to a more significant redistribution of the overall baghouse flow capacity between the melting furnace and holding furnace associated with Hot Baghouse #6 [Sidewell Melting Furnace #3 (Flex Line) and Holding Furnace #2 (CBS Line)], the Sidewell Melting Furnace #3 on the Flex Line shows a more substantial filterable PM emissions decrease (~12%) than the other melting furnaces routed to Hot Baghouses #4 and #5 (i.e., shared baghouses within only sidewell melting furnaces routed to them). As documented in Sections 4.2.7 and 4.2.8 of **Appendix C**, the NO_X and CO emission factors for natural gas combustion assigned to the Sidewell Melting Furnaces changed slightly (~1% decrease for NO_X and ~5% decrease for CO) based on the final burner performance specifications from the selected vendor (where the unit-specific CO emission factor from the vendor in the as-built updates replaced an estimate from AP-42 Table 1.4-1 in the original PSD application). All other emission factors and emission calculation methodologies for the Sidewell Melting Furnaces remain unchanged from the original PSD application.

5.3.3 Novelis Dual Chamber (NDC) Furnace Air Emissions Quantification

As documented in Section 5 and summarized in Table 1-1.3 of **Appendix C**, the small decrease (~6%) in assigned Hot Baghouse #7 flow capacity on a dry standard volumetric flow rate basis in the as-built configuration causes a corresponding decrease in annual potential filterable PM emissions from the NDC Recycle Furnace relative to the as-permitted configuration. However, when the moderate increase in design aluminum throughput is factored into the emission calculations for total PM_{10} and total $PM_{2.5}$, relatively small (<10% and <2 tpy) annual potential PM_{10} and $PM_{2.5}$ emissions are attributed to the as-built changes.

For NO_X, CO, VOC, GHG, and total HAP emissions with emissions contributions from both aluminum production and natural gas combustion, the aluminum throughput increase and burner heat input capacity decrease partially offset one another to produce varying impacts on the final as-permitted to as-built annual potential emissions comparison for the NDC Recycle Furnace. The vendor supplied NO_X emission factor for the final as-built configuration of the NDC Recycle Furnace increased from 143.2 lb/MMscf in the as-permitted case to 163.5 lb/MMscf in the as-built case (~14% increase) which resulted in a 3.7 tpy annual potential NO_X emissions increase (~6%) from the as-permitted to as-built configuration when coupled with the other process rate and burner rating changes. However, this relatively small NO_X emissions increase from the NDC Recycle Furnace is fully offset by decreases from the Sidewell Melting Furnaces and Round Top Furnaces such that the as-built configuration of the melting furnaces is actually showing a 7.3 tpy annual potential NO_X emissions decrease. The as-permitted CO emission factor for natural gas combustion emissions from the NDC Recycle Furnace was based on a reference emission factor from AP-42 Table 1.4-1 (84 lb CO/MMscf). As shown in Section 5.2.10 of **Appendix C**, a new vendor-supplied CO emission factor (73.5 lb CO/MMscf or ~14% decrease from as-permitted basis) has been introduced to the NDC Recycle Furnace as-built potential emission calculations resulting in a small CO potential emissions decrease (1.8 tpy and ~4%) between the as-permitted and as-built configurations of the furnace. With no change to the VOC emission factors between the as-permitted and as-built potential emission calculations, the competing effects of the higher aluminum throughput rate and lower burner heat input capacity result in a small VOC potential emissions increase (~3 tpy and ~12% increase) between the as-permitted and as-built calculations. Similarly, the offsetting impacts of the process rate changes contribute to a small GHG emissions change (~2% increase) with no changes to the underlying technical basis of the GHG emission factors. All other emission factors and emission calculation methodologies for the NDC Recycle Furnace remain unchanged from the original PSD application.

5.3.4 Round Top Furnace Air Emissions Quantification

Similar to the scenario associated with Hot Baghouse #6, the allocation of the total flow capacity for Hot Baghouses #8 and #9 between the Holding Furnaces and Round Top Furnaces has changed slightly (~10%

decrease in dry standard volumetric flow rate) due to a small redistribution of the baghouse flow from final engineering design data for the as-built configuration of the capture and collection system (refer to Section 6.2.1 of **Appendix C**). This updated flow capacity contribution for Hot Baghouses #8 and #9 assigned to each Round Top Furnace results in a corresponding decrease in filterable PM emissions (~0.6 tpy and ~10% decrease). The vendor-supplied NO_X emission factor update documented in Section 6.2.2 of **Appendix C** (from 127.4 lb NO_X/MMscf in the as-permitted configuration to 121.3 lb. NO_X/MMscf in the as-built configuration) coupled with the small burner heat input capacity reduction result in a ~4.7 tpy annual potential NO_X emissions reduction from each Round Top Furnace (~7% decrease between as-permitted and as-built configurations). As-built annual potential emissions changes for all other regulated NSR pollutants and HAP from the Round Top Furnaces are tied directly to process rate changes and represent very small changes on a relative basis in comparison the as-permitted configuration (<3% decreases). All other emission factors and emission calculation methodologies for the Round Top Furnaces remain unchanged from the original PSD application.

5.3.5 Holding Furnace Air Emissions Quantification

The as-built Holding Furnace annual potential emission calculations in Section 7 of **Appendix C** introduce a new series of furnace-specific filterable PM and total PM_{10} and $PM_{2.5}$ emission factor derivations to account for slight variation in the allocated flow capacities between Hot Baghouses #6 through #9. In general, the allocated baghouse flow capacities expressed on a dry standard volumetric flow rate basis have increased by approximately 30-40% resulting in filterable PM emissions increases of approximately 10-40% (~0.3 tpy to ~1.0 tpy) when the impacts of changes to aluminum process rates are also factored into the calculations and comparison between the as-permitted and as-built annual potential emissions. The as-permitted NO_X emission factor (62.5 lb NO_X/MMscf) was based on a vendor supplied estimate from a prospective equipment manufacturer for a similar furnace operation. As shown in Section 7.2.7 of **Appendix C**, the as-built potential emission calculations for the Holding Furnace use a more representative NO_X emission factor estimate (76 lb NO_X/MMscf) from the selected furnace vendor which results in small increase in annual potential NO_X emissions (~0.8 tpy and ~9%) between the as-permitted and as-built configurations of the furnace after considering the partially offsetting decrease in the burner heat input capacity. For the remaining pollutants (CO, VOC, SO_2, GHG, and total HAP) with no changes in the underlying emission factor basis between the as-permitted and as-built calculations, the as-built emission changes are purely a function of the maximum design hourly throughput increase or the maximum hourly burner heat input capacity decrease. All emission calculation methodologies for the Holding Furnaces remain unchanged from the original PSD application.

5.3.6 In-Line Degasser Air Emissions Quantification

As documented in Section 8 and summarized in Table 1-1.3 of **Appendix C**, the addition of a fourth In-Line Degasser and updates to annual process rates with no changes to the underlying technical basis of the controlled filterable PM/PM_{10}/$PM_{2.5}$ emission factors applied to the In-Line Degassers result in a small annual potential emissions increases (~2.5 tpy PM, 1.3 tpy PM_{10}, and 0.5 tpy $PM_{2.5}$) across all four (4) In-Line Degassers in the as-built configuration in comparison to the three (3) In-Line Degassers in the as-permitted configuration. Annual potential HCl emissions are also influenced by the equipment count and process rate changes in the same proportion as PM/PM_{10}/$PM_{2.5}$ emissions due to the use of aluminum process rate normalized emission factors for both sets of regulated pollutants.

5.3.7 Sow Dryer Air Emissions Quantification

As documented in Section 9 and summarized in Table 1-1.3 of **Appendix C**, Novelis proposed an annual operating limitation for Sow Dryer natural gas usage set equal to the original PSD permit basis that

produces equivalent annual potential emissions from the two (2) Sow Dryers for all regulated pollutants other than NO_X. As shown in Section 9.2.1 of **Appendix C**, the as-permitted NO_X emission factor (54.0 lb NO_X/MMscf) based on similar unit vendor estimates and Novelis' originally planned burner emissions performance specification has been replaced with a more representative vendor estimate of burner NO_X emissions performance (109.2 lb NO_X/MMscf) in the as-built configuration of the Sow Dryers. The Sow Dryers require a direct-fired, high velocity burner system with a high turndown capacity which carries a distinct NO_X emissions performance profile from other more conventional natural gas-fired burner applications for other aluminum furnace and preheating systems. The higher design short-term burner heat input capacity and the resulting higher instantaneous NO_X emission factor combine to contribute to 4.8 tpy NO_X emissions increase from each of the two (2) Sow Dryers which still reflects a very small percentage (<1%) of the Melting and Casting process area-wide annual potential NO_X emissions total in the as-built configuration of the Bay Minette facility (554 tpy NO_X). All other emission factors and emission calculation methodologies for the Sow Dryers remain unchanged from the original PSD application.

5.3.8 Dross House Air Emissions Quantification

As documented in Section 10 and summarized in Table 1-1.3 of **Appendix C**, a small adjustment (~3.3% decrease) to the shared Hot Baghouse #2 flow capacity contribution from the Dross House at standard conditions results in corresponding small decrease (~0.2 tpy) in the annual potential filterable PM emissions assigned to the Dross House. All other aspects of the filterable PM/PM_{10}/$PM_{2.5}$ emission calculation methodology for the Dross House remain unchanged from the original PSD application.

5.3.9 Dross Press Air Emissions Quantification

The change in control configuration for the Dross Presses from the uncontrolled exhaust being routed to a Hot Baghouse to being equipped with dedicated, integral filtration units affects the potential PM emission calculation methodology by requiring updates to the controlled filterable PM exit grain loading design basis and dry standard volumetric flow capacity of the filtration unit. As documented in Section 11.2.1 of **Appendix C**, the filterable PM exit grain loading design basis for the integral filtration unit has been updated to 0.010 gr/dscf which matches EPA's default reference value for achievable filterable PM emissions performance of similar cartridge filter type PM control systems.[9] The dry standard flow capacity of the controlled Dross Presses in the as-built configuration (1,947 dscfm) generally falls within the same range as the flow capacity of the uncontrolled Dross Presses from the as-permitted configuration (1,500 dscfm). These two design elements of the as-built configuration of the two (2) remaining Dross Presses combine to result in a small annual potential filterable PM emissions increase (~1 tpy) and continue to confirm the Dross Presses as small sources of filterable PM emissions even under worst-case assumptions regarding continuous use of these intermittently used batch units.

5.3.10 Ceramic Foam Filter (CFF) and Deep Bed Filter (DBF) System Air Emissions Quantification

The combined maximum burner heat input capacity of the molten metal filtration unit preheating systems when both a CFF and DBF are used increased from 3.48 MMBtu/hr in the as-permitted configuration to 6.32 MMBtu/hr in the as-built configuration (refer to Section 12 of **Appendix C**). For all regulated pollutants other than NO_X where the as-permitted emission factor basis is retained for the as-built potential emission calculations, this change in CFF and DBF System preheater burner capacity produces relatively small annual potential emissions changes (<0.5 tpy for PM/PM_{10}/$PM_{2.5}$, VOC, SO_2, and total HAP and ~5.5 tpy for CO). As

[9] EPA, Air Pollution Control Technology Fact Sheet: Paper/Nonwoven Filters – Cartridge Collector Type with Pulse Jet Cleaning, EPA-452/F-03-004, https://www.epa.gov/sites/default/files/2020-08/documents/ff-cartr.pdf

documented in Section 12.3 of **Appendix C**, the CFF and DBF System preheater NO_X emission factors were increased by a small amount (<10%) to reflect updated estimates from the selected equipment vendor in the as-built configuration as a replacement for the less site-specific vendor emissions estimate for a similar filter box preheater burner system used in the as-permitted configuration. All other emission factors and emission calculation methodologies for the CFF and DBF Systems remain unchanged from the original PSD application.

5.3.11 Molten Metal Utility Heaters Air Emissions Quantification

As documented in Section 13 **Appendix C**, the new Molten Metal Utility Heaters are sources of normal natural gas combustion byproduct emissions, and they do not generate any other regulated air pollutant emissions. Particulate matter ($PM/PM_{10}/PM_{2.5}$) emissions for the Molten Metal Utility Heaters are calculated using the same natural gas combustion emission factors presented in Section 9.2.3 of **Appendix C** for the Sow Dryers that derived from a combination of the filterable PM emission factor from AP-42 Table 1.4-2 and EPA's SPECIATE database profile for natural gas sources. All other regulated pollutant emission factors assigned to the Molten Metal Utility Heaters are default values from EPA publications (AP-42 Chapter 1.4 and 40 CFR 98 Subpart C Tables C-1 and C-2) with the same underlying technical basis as emission factors originally applied to the Trough Heaters in the as-permitted configuration.

5.3.12 Casting Unit Air Emissions Quantification

The casting process has the potential to produce a small amount of VOC emissions from evaporative loss of the organic compound fraction of the lubricant periodically applied to the casting molds during the direct chill casting process. The addition of fourth casting pit (second casting pit on the Flex Line) results in a small increase in annual potential VOC emissions (~0.4 tpy) assigned to the DC1-DC4 Casting Unit- Lubricant Usage (MC-31).

5.3.13 Melting and Casting Ingot Saw Air Emissions Quantification

As documented in Section 14 and summarized in Table 1-1.3 of **Appendix C**, small changes to the process rates, integral filtration unit flow capacity, and maximum hourly lubricant usage for the Melting & Casting Ingot Saw (MC-32) contribute to a negligible increase in annual potential $PM/PM_{10}/PM_{2.5}$ emissions (<0.01 tpy) and a small increase in annual potential VOC emissions (<1 tpy) between the as-permitted and as-built configurations of the Melting & Casting Ingot Saw. The technical basis of the $PM/PM_{10}/PM_{2.5}$ and VOC emission calculation methodology for the Melting & Casting Ingot Saw has not changed between the as-permitted and as-built configurations. Only as-built updates to Melting & Casting Ingot Saw equipment specifications have been included in the revised annual potential emission calculations

5.4 Suggested PSD Permit Changes

The following sections summarize the key PSD permit changes needed to reflect the as-built changes to emission unit naming, process equipment and control device engineering design and operating specifications, and corresponding potential emissions changes.

5.4.1 Decoater (X003-X005) PSD Permit Changes

- Update numbering for Decoaters #1-#3 to match the as-built nomenclature reflected in the Emission Unit Index provided in **Appendix A** on the cover page and in the unit-specific provisos of each affected PSD permit.

- Update all Decoater BACT limits expressed in units of lb/hr proposed by Novelis and summarized in **Appendix A** and the corresponding aluminum process rate normalized emission limits added by ADEM with reference to Section 3 of **Appendix C**.

5.4.2 Sidewell Melting Furnace (X006-X008) PSD Permit Changes

- Update numbering for Sidewell Melting Furnaces #1-#5 to match the as-built nomenclature reflected in the Emission Unit Index provided in **Appendix A** on the cover page and in the unit-specific provisos of each affected PSD permit.
- Update all Sidewell Melting Furnace BACT limits expressed in units of lb/ton proposed by Novelis and summarized in **Appendix A** and the corresponding mass emission rate-based (lb/hr) emission limits added by ADEM with reference to Section 4 of **Appendix C**.

5.4.3 NDC Furnace (X009) PSD Permit Changes

- Update all NDC Recycle Furnace BACT limits expressed in units of lb/ton proposed by Novelis and summarized in **Appendix A** and the corresponding mass emission rate-based (lb/hr) emission limits added by ADEM with reference to Section 5 of **Appendix C**.

5.4.4 Round Top Furnace (X010-X011) PSD Permit Changes

- Update numbering for Round Top Furnaces #1 and #2 to match the as-built nomenclature reflected in the Emission Unit Index provided in **Appendix A** on the cover page and in the unit-specific provisos of each affected PSD permit.
- Update all Round Top Furnace BACT limits expressed in units of lb/ton proposed by Novelis and summarized in **Appendix A** and the corresponding mass emission rate-based (lb/hr) emission limits added by ADEM with reference to Section 6 of **Appendix C**.

5.4.5 Holding Furnace (X008-X011) PSD Permit Changes

- Move the PSD permit references and update the numbering for Holding Furnaces #1-#4 to match the as-built nomenclature reflected in the Emission Unit Index provided in **Appendix A** on the cover page and in the unit-specific provisos of each affected PSD permit. The specific PSD permit number for a Holding Furnace should continue to be defined by the Hot Baghouse that each furnace is routed to such that the updates to the Hot Baghouse #6-#9 routing for Holding Furnaces requires certain emission units to move between the affected PSD permits X008-X011.
- Update all Holding Furnace BACT limits expressed in units of lb/ton proposed by Novelis and summarized in **Appendix A** and the corresponding mass emission rate-based (lb/hr) emission limits added by ADEM with reference to Section 7 of **Appendix C**.

5.4.6 In-Line Degasser (X008-X011) PSD Permit Changes

- Update the name of In-Line Degasser #3 (Flex Line) (MC-33) in PSD permit X009 to replace the prior In-Line Degasser #1 (Flex Line) (MC-16) reference which reflects the dedicated connection between this In-Line Degasser, the associated Holding Furnace, and Hot Baghouse #7 in the as-built configuration in place of the dual Hot Baghouse #7/#8 arrangement in the as-permitted configuration.
- Update the name of In-Line Degasser #4 (Flex Line) (MC-16) in PSD permit X010 to replace the prior In-Line Degasser #1 (Flex Line) (MC-16) reference which reflects the dedicated connection between this

In-Line Degasser, the associated Holding Furnace, and Hot Baghouse #8 in the as-built configuration in place of the dual Hot Baghouse #7/#8 arrangement in the as-permitted configuration.

- Move and rename In-Line Degasser #2 (CBS Line) (MC-17) from being covered in PSD permit X011 in the as-permitted configuration to PSD permit X008 in the as-built configuration to reflect the switch of this In-Line Degasser from being routed to Hot Baghouse #9 in the as-permitted arrangement to being routed to Hot Baghouse #6 in the as-built arrangement.
- Move and rename In-Line Degasser #1 (CBS Line) (MC-18) from being covered in PSD permit X008 in the as-permitted configuration to PSD permit X011 in the as-built configuration to reflect the switch of this In-Line Degasser from being routed to Hot Baghouse #6 in the as-permitted arrangement to being routed to Hot Baghouse #9 in the as-built arrangement.
- Update all In-Line Degasser BACT limits expressed in units of lb/ton proposed by Novelis and summarized in **Appendix A** and the corresponding mass emission rate-based (lb/hr) emission limits added by ADEM with reference to Section 8 of **Appendix C**.

5.4.7 Sow Dryer (X006-X007) PSD Permit Changes

- Update numbering for Sow Dryers #1-#2 to match the as-built nomenclature reflected in the Emission Unit Index provided in **Appendix A** on the cover page and in the unit-specific provisos of each affected PSD permit.
- Update all Sow Dryer BACT limits expressed in units of lb/hr proposed by Novelis and summarized in **Appendix A** and the corresponding natural gas heat input rate normalized (lb/MMBtu) emission limits added by ADEM with reference to Section 9 of **Appendix C**.

5.4.8 Dross House (X004) PSD Permit Changes

- Update all Dross House BACT limits expressed in units of lb/hr proposed by Novelis and summarized in **Appendix A** and the corresponding dross process rate normalized (lb/ton) emission limits added by ADEM with reference to Section 10 of **Appendix C**.

5.4.9 Dross Press (X008-X009) PSD Permit Changes

- Update the name of the Dross Press reference in PSD permit X008 from Dross Presses #3 and #4 (MC24 & MC-25) to Dross Press #1 (CBS Line) (MC-24) to reflect the as-built configuration and to reflect the Emission Unit Index nomenclature in **Appendix A**.
- Update the name of the Dross Press reference in PSD permit X009 from Dross Presses #1 and #2 (MC-22 and MC-23) to Dross Press #2 (Flex Line) (MC-22) to reflect the as-built configuration and to reflect the Emission Unit Index nomenclature in **Appendix A**.
- Add new BACT-specific provisos to PSD permits X008 and X009 to reflect the updated PM BACT determination for the Dross Presses in their as-built configuration with interior venting integral filtration units.

5.4.10 Melting and Casting Ingot Saw (X012) PSD Permit Changes

- Update the ADEM imposed Melting & Casting Ingot Saw numerical BACT limits (i.e., Novelis has originally proposed only integral filtration unit operating requirements as BACT) expressed in units of lb/hr and lb/ton to match the as-built potential emission calculations presented in Section 14 of **Appendix C**.

5.4.11 Melting & Casting Insignificant Support Operations

ADEM chose to originally exclude the CFF and DBF Systems, Trough Heaters, and Casting Unit – Lubricant Usage from explicit coverage in a PSD permit presumably due to the interior venting, fugitive nature of their regulated air pollutant releases, the technical infeasibility of any direct pollutant measurements, and the generally small potential emissions for all regulated pollutants from these support operations. Novelis considers the as-built configuration of the CFF and DBF Systems, Molten Metal Utility Heaters, and DC1-DC4 Casting Unit – Lubricant Usage to qualify for this same insignificant unit status without the need to explicitly added these sources to a revised PSD permit.

5.5 BACT Determination Updates

Most proposed BACT limit changes are a function of as-built updates to process equipment and control devices specifications and not an underlying change to the emission calculation methodology or reference emission factors that were applied in the original evaluation. In these instances where a BACT limit is only being updated to reflect minor as-built design specification changes, the prior top-down BACT analyses presented in the original PSD permit application are still applicable and do not require an updated BACT determination. Conversely, in instances where an as-built potential emission calculation change has resulted in a substantive regulated NSR pollutant emission factor increase not related to process rate and control device flow capacity changes, reconsideration of the original BACT determination is warranted.

The following sections address each instance where a Melting and Casting area emission unit is showing an as-built emission factor increase for a regulated NSR pollutant that is not directly related to a process rate or control device flow capacity change and that results in a proposed increase in a corresponding BACT limit as summarized in **Appendix A**. BACT reviews for new emissions units in the Melting and Casting area are also addressed.

5.5.1 NDC Recycle Furnace NO_X BACT Evaluation Updates

The original NO_X BACT determination for the NDC Recycle Furnace was presented under the "Molten Metal Processing Furnaces" heading in **Sections 7.2.2, 7.3.2, 7.4.2, 7.5.2, and 7.6.2** of the original PSD application. Available NO_X control options presented in Step 1 of the NO_X BACT evaluation for the NDC Recycle Furnace included good combustion and operating practices (GCOP), cold air and regenerative low NO_X burners (LNB), selective catalytic reduction (SCR), and selective non-catalytic reduction (SNCR). In the technical feasibility analysis of Step 2, GCOP and LNB were determined to be technically feasible for the NDC Recycle Furnace, and SCR and SNCR were determined to be technically infeasible. However, an annualized control cost analysis for SCR was presented in the subsequent Step 4 economic, environmental, and energy impact analysis. The remaining NO_X control options were ranked by NO_X removal effectiveness with SCR ranking as the top option followed by LNB and GCOP (refer to **Table 7-6** of the original PSD application). Sections G-7 of **Appendix G** in the original PSD application presented the cost analysis assuming a separate single SCR system would be used to control the NO_X emissions generated at the discharge of Hot Baghouse #7 serving the NDC Recycle Furnace. Based on the high annualized control costs documented in **Table 7-7** of the original PSD application, Novelis concluded (and ADEM concurred) that installing and operating an SCR system for reducing NO_X emissions from the NDC Recycle Furnace is considered not cost effective. In view of this adverse economic impact, and because the system would not be considered technically feasible in any event, due to the technical challenges cited in Step 2 regarding designing and installing a large exhaust gas preheating system, SCR as a NO_X control option for the NDC Recycle Furnace was eliminated from further consideration in this BACT analysis.

In the final BACT limit setting Step 5 of the NO_X BACT evaluation, Novelis proposed to equip the NDC Recycle furnace with regenerative LNB in the main hearth chamber and cold air LNB in the charging chamber to achieve compliance with a NO_X BACT limit of 0.54 lb/ton (as reflected in specific proviso 14 of the initial PSD permit X009). This initial NO_X BACT emission limit for the NDC Recycle Furnace is based on a combination of comparable furnace source testing for NO_X emissions from metal processing and vendor estimates for NO_X emissions from natural gas combustion, and the proposed NO_X BACT limit includes both metal processing and natural gas combustion contributions.

As documented in Section 5.2.5 of **Appendix C**, Novelis is not proposing to change the uncontrolled NO_X emission factor tied to aluminum production (0.16 lb NO_X/ton) that was originally factored into the NDC Recycle Furnace NO_X BACT limit. However, the uncontrolled NO_X emission factor tied to natural gas combustion has been increased from 143.25 lb NO_X/MMscf from the original PSD application based on preliminary vendor-supplied emissions estimates to 163.5 lb NO_X/MMscf based on the final, as-built NO_X emissions estimates from the selected furnace equipment and burner system vendors. Although the proposed NDC Recycle Furnace NO_X BACT limit for the as-built configuration of the furnace presented in Table A-2 of **Appendix A** actually decreases by a small amount (from 0.54 lb NO_X/ton in the as-permitted configuration to 0.51 lb NO_X/ton in the as-permitted configuration resulting in a ~6% decrease in the NO_X BACT limit), the annual potential NO_X emissions from the NDC Recycle Furnace have increased by a small amount (~3.7 tpy NO_X from 57.6 tpy NO_X in the as-permitted configuration to 61.2 tpy NO_X in the as-built configuration).

To definitively confirm that this annual potential NO_X emissions change for the NDC Recycle Furnace does not influence the conclusions of the SCR control cost analysis, Novelis has prepared an updated version of the SCR cost analysis reflecting the as-built design specifications of Hot Baghouse #7 and the associated NO_X emissions produced by the associated NDC Recycle Furnace and Holding Furnace #3 (Flex Line). The annualized control cost for installing SCR for NO_X emissions control on Hot Baghouse #7 increased from $49,569/ton NO_X removed in the as-permitted configuration to $54,125/ton NO_X removed in the as-built configuration despite the increase in annual potential NO_X emissions from the NDC Recycle Furnace to various offsetting effects from changes to Hot Baghouse #7 design specifications and various process equipment specification updates for the associated NDC Recycle Furnace and Holding Furnace #3. This updated NO_X control cost analysis continues to demonstrate that SCR is not a cost effective control option for the NDC Recycle Furnace even if the technical infeasibility issues noted in Step 2 of the original NO_X BACT evaluation did not apply.

Compliance with the revised NDC Recycle Furnace NO_X emission limit will be demonstrated by operating and maintaining the furnace in accordance with the manufacturer's recommendations, instructions, and/or operating manual(s), with any modifications as deemed necessary by the facility. Novelis will also demonstrate compliance with the NDC Recycle Furnace NO_X BACT limit by conducting initial and once per 5-year performance tests in accordance with applicable EPA Reference Methods as noted in PSD permit X009 special provisos for Compliance and Performance Test Methods and Procedures No. 5 and Emissions Monitoring No. 2.

5.5.2 Holding Furnace NO_X BACT Evaluation Updates

The original NO_X BACT determination for the Holding Furnaces was presented under the same "Molten Metal Processing Furnaces" heading in **Sections 7.2.2, 7.3.2, 7.4.2, 7.5.2, and 7.6.2** of the original PSD application as discussed above for the NDC Recycle Furnace. The same available control technologies, technical feasibility determinations, remaining control option ranking by effectiveness, and economic, environmental, and energy impact analysis procedures described for the NDC Recycle Furnace were applied to the Holding Furnaces. The as-built changes to the NO_X potential emissions of the Holding Furnaces

involve a small increase in the NO_X emission factor (from 62.5 lb NO_X/MMscf in the as-permitted configuration to 76.0 lb NO_X/MMscf in the as-built configuration) and a partially offsetting decrease in the maximum hourly burner heat input rating (from 30.0 MMBtu/hr in the as-permitted configuration to 27.0 in the as-built configuration) which results in a relatively small annual potential NO_X emissions increase (~0.8 tpy and 9%) between the as-permitted and as-built configurations. This relatively small NO_X emissions change attributable to the as-built updates for the Holding Furnaces does not affect any of the prior conclusions of the NO_X BACT determination including the cost effectiveness basis for eliminating SCR as an available NO_X control option. Novelis updated NO_X BACT limit for the Holding Furnaces (0.034 lb NO_X/ton) and associated hourly and annual potential emission rates (2.05 lb NO_X/hr and 8.99 tpy NO_X) remain comparable to other recently permitted Holding Furnaces as summarized in Table F-6 of **Appendix F** to the original PSD application. Therefore, Novelis updated the NO_X BACT determination for the Holding Furnaces based on the use of GCOP and LNB is comparably stringent to other recently permitted PSD projects at secondary aluminum casting facilities.

5.5.3 Sow Dryer NO_X BACT Evaluation Updates

The Sow Dryer NO_X emission factor change from the as-permitted to as-built configurations represents a relatively significant increase and a change to a NO_X emissions profile which may not readily be considered "low NO_X" for conventional, indirect-fired natural gas combustion systems on various other industrial boilers and process heaters. As part of an inquiry from the Kentucky Division for Air Quality (KDAQ) for a similar as-designed NO_X BACT limit increase request (from 54.0 lb NO_X/MMscf in the as-permitted configuration to 147.8 lb NO_X/MMscf in the as-built configuration for that affected unit in Novelis' PSD application for an aluminum casting plant located in Guthrie, Kentucky), Novelis conducted a detailed technical investigation into the reasons for the vendor-supplied NO_X emissions performance for the selected LNB exceeding the more typically expected performance for more conventional combustion systems. This research with the dryer vendor technical teams revealed the following key factors that affect the specific operating profile criteria used to design the Sow Dryer burner systems and makes them notably different than other types of industrial, natural gas-fired combustion systems:

- The selected Algas-SDI Phoenix Velocity Heat (VH) direct fired burners can be generally characterized in the same burner class line-style air heating and duct burners which are specially designed to operate in low temperature applications with high individual burner turndown capacities achieved using dedicated fuel supply lines and combustion air fans.[10]
- This burner category is unique and distinct from the more conventional multi-burner high temperature applications burner with central combustion air fans and specifically the types of direct-fired furnace burners that would be commonly associated with most secondary aluminum melting and other process heating applications.
- In order to reach the required process gas conditions (such as flow velocity, temperature profile/uniformity, and other related heat transfer characteristics) inside the Sow Dryer chamber where the load is present, the proposed Sow Dryer design uses high temperature air recirculation fans. These fans circulate the process gases by impelling the cooled process gases through the heating source (i.e., Algas SDI VH burners) located in the heating chamber and blowing the heated process gas from the heating chamber into the dryer chamber thereby assuring, a closed circuit forced recirculation method of operation for the process gas recirculation system. The selected high turndown, direct-fired burner head with dedicated combustion air supply fan is ideal for a process gas recirculation system with discrete temperature limitations like a sow drying application.

[10] https://algas-sdi.com/combustion-products/velocity-heat-direct-fired-burner/

- Although the selected Sow Dryer design meets or exceeds all of Novelis' equipment specifications and represents the best technology solution from a business decision perspective, the Algas-SDI burner system cannot necessarily meet the same short-term maximum NO_X emissions performance as the alternative nozzle mixing-type direct fired burners in melting furnace and other solid metal processing furnace applications when evaluated exclusively on a NO_X concentration (i.e., ppmvd NO_X at 3% O_2) basis or heat input rate normalized NO_X emission factor basis (lb NO_X/MMBtu). However, given the better overall energy efficiency performance for the selected Sow Dryers design in comparison to systems relying on conventional LNB technology, Novelis expects that it will result in less overall drying time and corresponding overall natural gas consumption required to deliver the desired target temperatures and dryness levels.
- Furthermore, the NO_X emissions profile associated with the selected burner system is very application specific and cannot integrate some of the commonly applied low NO_X features available for other more conventional burner types (i.e., staged combustion zones with varying proportions of fuel to air mixing) in their design. Process requirements such as upstream and downstream process temperatures, air velocity over the burner, and firing rate per foot of burner length will all affect the direct-fired burners combustion dynamics and associated NO_X emissions performance.
- The selected Airgas-SDI VH burners offer a flame shape that acts like a curtain of thermal energy and offers the time to homogenize the heat inside the chamber. This burner design offers better thermal performance than nozzle mixing-type direct-fired furnace burners because these nozzle mixing-type burners have a higher number of longer cylindrical flames with less effective heat transfer characteristics to the relatively high velocity flow of recirculating process air. This simple and robust combustion air supply and flame pattern solution the selected burner system offers superior process control that supports the rapid and precise changes in burner firing patterns required to achieve optimal process air temperature conditions at all times. Lower electricity requirements for the combustion air fan, superior thermal efficiency from achieving effectively 100% combustion efficiency, and more precise process control are all key process differentiators that favor the selected burner application over a "legacy" dryer design involving nozzle mixing-type burners that may be able to achieve the as-permitted NO_X emissions performance level.

In consideration of the case-by-case nature of the BACT review process and the recently permitted Novelis Guthrie Sow Dryer with a comparable NO_X BACT limit, Novelis considers the proposed NO_X emission factor (109.2 lb NO_X/MMscf) supporting the Bay Minette facility's Sow Dryer NO_X BACT limit (3.28 lb NO_X/hr) in its as-built configuration to satisfy applicable BACT requirements. For the 30 MMBtu/hr Sow Dryer, the SCR control option was not considered to be available or applicable to such a small combustion system operating on a variable firing rate basis to preheat batches of melting furnace charge materials. Regardless, Novelis expects the control costs for installing SCR on the Sow Dryer for NO_X emissions control to exceed the costs for the other larger and higher emitting sources in this category (e.g., Pusher Furnaces), and therefore, consistent with all other natural gas combustion sources carried in the project scope, SCR for NO_X emissions control for the Sow Dryer was eliminated from further consideration in the original BACT analysis. The as-built changes to the Sow Dryer would not alter the prior conclusion of eliminating SCR as an available, technically feasible, and/or cost effective control option for reducing NO_X emissions from a small, batch-type combustion unit like the Bay Minette facility's Sow Dryers.

Compliance with the proposed NO_X emission limit for the as-built configuration of the Sow Dryers will be demonstrated by operating and maintaining the dryer in accordance with the manufacturer's recommendations, instructions, and/or operating manual(s), with any modifications as deemed necessary by the facility.

5.5.4 Dross Press PM/PM_{10}/$PM_{2.5}$ BACT Evaluation Updates

The original PM/PM_{10}/$PM_{2.5}$ BACT determination for the Dross Presses was presented under the "Dross Handling and Storage" heading in **Sections 6.1.4, 6.2.4, 6.3.4, 6.4.4, and 6.5.4** of the original PSD application. Generally available technologies and practices which could be potentially applied to control PM emissions from the Dross Presses identified in Step 1 included fabric filtration, electrostatic precipitators, wet scrubbers, cyclones, and good design and operating practices. ESP, venturi-type scrubbers, and cyclones were eliminated as technically infeasible in Step 2 of the Dross Storage and Handling BACT analysis. The remaining PM control options (fabric filtration, wet scrubbers, and good design and operating practices) were ranked under Step 3 and presented in **Table 6-16** of the original PSD application with the selected fabric filtration PM control option ranked as the most effective PM control option for Dross Storage and Handling operations. No adverse economic, environmental, and energy impacts were identified in Step 4 as being associated with the selected Dross Press control options. Due to the low flow capacity of the integral capture systems (1,500 scfm) and low filterable PM concentration achieved after accounting for the dust containment/minimization process associated with the Dross Presses, the very low short-term PM emission rate (0.026 lb/hr) in the as-permitted configuration did not warrant an individual unit BACT emission limit. Furthermore, separately measuring the very small Dross Press PM emissions contribution to the large flow capacity Hot Baghouses #6 and #7 was not considered to be technically feasible using standard EPA reference methods. Therefore, Novelis proposed establishing BACT on the basis of a baghouse control requirement and implementing associated baghouse parametric monitoring required under SMACT. ADEM concurred with this rationale and chose not to implement any numerical BACT limits for the Dross Presses in the initial PSD permit package.

Although the integral filtration units associated with the as-built configuration of the Dross Presses does not achieve as low of an exit grain loading basis as the original Hot Baghouse control configuration reflected in the original PM/PM_{10}/$PM_{2.5}$ BACT determination, the filtration units do still achieve a reasonable PM exit concentration and provide adequate capture and control of any PM emissions generated by the dross pressing activity. Therefore, Novelis considers the prior Dross Storage and Handling operation PM/PM_{10}/$PM_{2.5}$ BACT determination to be applicable to the as-built configuration of the Dross Presses without specifically revisiting any of the specific steps in the top-down BACT review process.

5.5.5 Molten Metal Utility Heaters BACT Evaluation Updates

As documented in **Section 5.3** of the original PSD application, small natural gas-fired combustion systems generating fugitive emissions inside of the main production buildings such as the CFF/DBF preheaters and trough heaters were addressed via a qualitative/narrative BACT review process in lieu of the formal 5-step, top-down BACT review procedure applied to the primary emission units equipped with stacks or vents. Like these small combustion system addressed in the as-permitted configuration of the Melting and Casting area, each Molten Metal Utility Heater with a maximum hourly burner heat input capacity of 0.36 MMBtu/hr would be considered an insignificant activity if it were not subject to PSD review because they are small sources of uncaptured natural gas combustion byproduct emissions that are otherwise subject to generally applicable requirements. Setting BACT limits for the Molten Metal Utility Heaters is not technically feasible because their combustion byproduct emissions are not captured in a hood or duct for subsequent measurement using EPA Reference Test Methods. In cases where emissions cannot be measured, work practice standards can be established as BACT in lieu of emission limits. Such work practice standards will be mandated through Novelis "general duty" requirement captured at General Permit Proviso 7 which specifically requires all process equipment to be "maintained and operated at all times in a manner so as to minimize the emissions of air contaminants." Therefore, no additional compliance requirements for the Molten Metal Utility Heaters are warranted.

5.6 Air Quality Analysis Updates

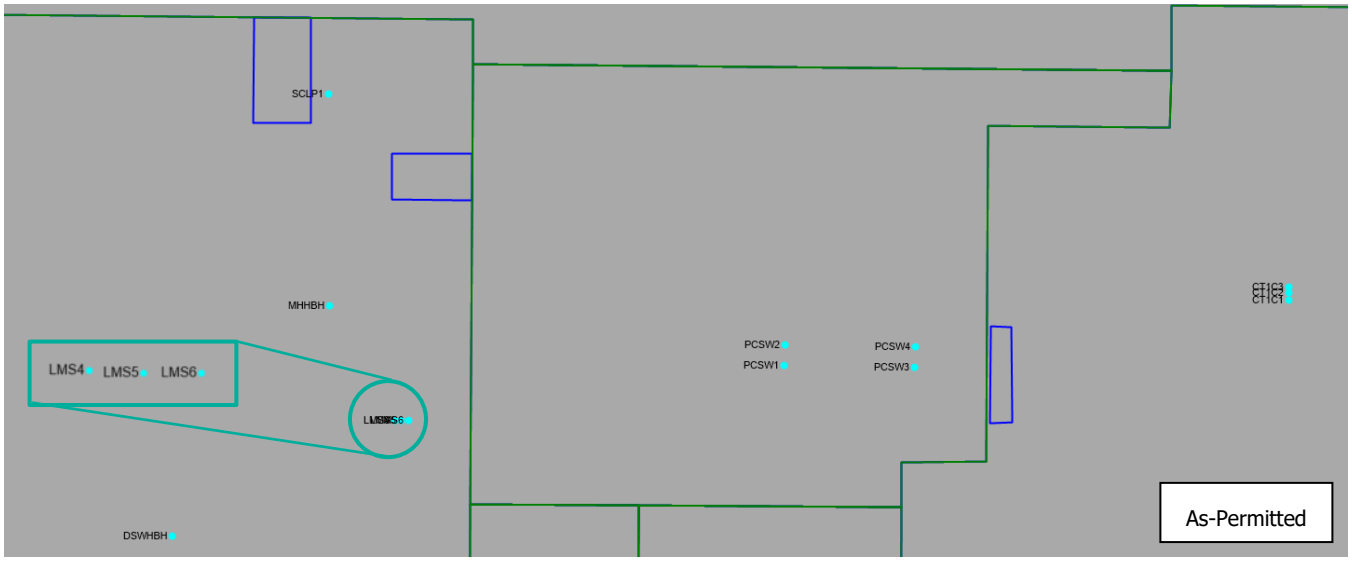
As shown in the "plot plan" (looking down) views in **Figure 5-1** and 3D/elevation views in 3D/elevation (looking across) views in **Figure 5-2**, the primary as-built changes for the Melting & Casting process area with the potential to influence the air quality analysis include the following items. Refer to Figure A-1 in **Appendix A** for the overlayed building layout for the as-permitted and as-built Melting & Casting process area configurations:

- Main Melting/Casting Building (Building ID = MELTCST) shifted slightly (~30 ft) to the northwest, but retained the same basic configuration, dimensions, and shape, as well as similar maximum roof height (93.8 ft in as-permitted configuration and 99.8 ft in as-built configuration resulting in ~6% building downwash structure height increase).
  - This small shift in location and increase in height of the main Melting/Casting building does not have a substantial impact on the downwash intensity of any of the modeled point sources associated with the Melting and Casting area. As shown in **Figure 5-3**, the maximum good engineering practice (GEP) value of stack MHHBH increased a negligible amount.
- Removal of the four (4) Scalper Chip Handling System Pneumatic Conveyor (PCSW1 to PCSW4) with combined maximum hourly potential emissions of 0.70 lb/hr of $PM_{10}/PM_{2.5}$ is expected to be more than fully offset by any $PM_{10}/PM_{2.5}$ modeled emission rate increases from adding cells to the as-permitted Casting Cooling Tower #1 (Model ID = CT1) or the newly added Round Top/Pusher Furnace Cooling Tower (CT5) (where CT1 in the as-built configuration is on the east side of the main Melting/Casting Building with the new CT5 located approximately 200 ft north of this expanded CT1 source).The Decoater-Sidewell Hot Baghouse Combined Stack (DSWHBH) receiving the controlled exhaust streams from Hot Baghouses #1-#5 and the Melter-Holder Hot Baghouse Combined Stack receiving the controlled exhaust streams from Hot Baghouses #6-#9 have shifted a very small amount to the northwest by approximately the same amount as the main Melting/Casting Building such that the relative position of the main production buildings and these tall, combined baghouse stacks are the approximately the same between the as-permitted and as-built configurations. In addition, minor changes to the lower tier support buildings surrounding the main Melting/Casting building have occurred [including the addition of a very small new breakroom (BREAK), removal of the Scalper Bay Loading (SCLPBYLD) building, and changes to the dimensions of the previously included Casting and Recycling Office (CSTRECYC) and Electric Room 10 (EL10)]
  - As shown in **Figure 5-3**, the maximum downwash intensity for MHHBH is not influenced by these small building changes as the primary contributor to the BPIP parameters for this stack is the Main Melting/Casting Building. In addition, stack DSWHBH is not subject to the effects of downwash in both the as-permitted and as-built configurations.
- A two-tier Central Maintenance building complex (BLDG22 with maximum roof height of 50.1 ft and BLDG23 with a maximum roof height of 29.2 ft) along with a much smaller footprint storage building (BLDG24 with maximum roof height of 31.7 ft) have been added to the as-built configuration of the Bay Minette facility.
  - While the taller tier of the Central Maintenance Building is located within the "5L" downwash influence zone of the MHHBH stack, the closest edge of the building to the MHHBH stack location lies at the outer boundary of this 5L-based downwash influence zone, and the maximum building roof height (50.1 ft) falls well below the stack height (180 ft). In addition, as shown in **Figure 5-3**, the maximum downwash intensity for MHHBH is not influenced by these ancillary buildings (i.e., lower GEP height of 38.2 m for winds from west associated with Central Maintenance Building as downwash structure vs. maximum GEP of 73.0 m associated with the main Melting/Casting Building).

Finally, the upwind direction of this new Central Maintenance Building lies in a low frequency wind direction from the west for the Mobile, AL surface station meteorological dataset used in the original PSD air quality analysis which is not associated with any maximum impact locations for the Bay Minette facility for any pollutant and averaging period.

- As shown in **Table 5-1** and **Table 5-2**, the as-permitted and as-built stack parameters for the DSWHBH and MHHBH combined Hot Baghouse stacks are largely the same with only small changes to stack diameter and associated exit velocities. The stack heights determined by the original PSD modeling analysis (120 ft for DSWHBH and 180 ft for MHHBH) were retained in the as-built engineering design basis. The Sow Dryer #1 and #2 (SWDRY1 & SWDRY 2) stacks (shown in **Figure 4-1** and **Figure 4-2** due to location within the Scrap Processing area) have an approximately equivalent stack height, higher stack temperature, higher exit velocity, and smaller stack diameter between the as-permitted and as-built configuration. The Hot Baghouse Lime Silos have equivalent stack parameters between the as-permitted and as-built configurations (based on current engineering design details), and the two (2) new Cold Baghouse Dry Sorbent Silos have equivalent stack parameters to the Lime Silos based on equivalent process equipment being used in both applications.
  - Addition of the two (2) Dry Sorbent Silos is partially offset by removal of one Lime Silo.

Figure 5-1. Melting & Casting Area As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View)



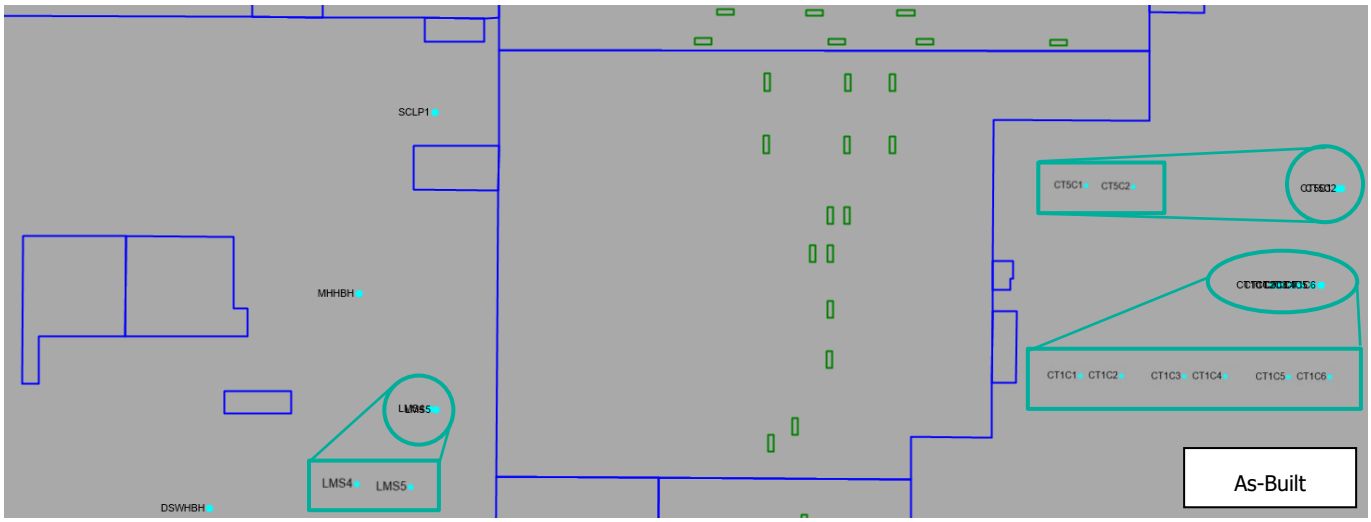

SCLP1
MHHBH
LMS4
LMS5
DSWHBH
CT5C1
CT5C2
CT1C1
CT1C2
CT1C3
CT1C4
CT1C5
CT1C6
As-Built

Figure 5-2. Melting & Casting Area As-Permitted vs. As-Built Modeling Setup Comparison (3D/Elevation View)

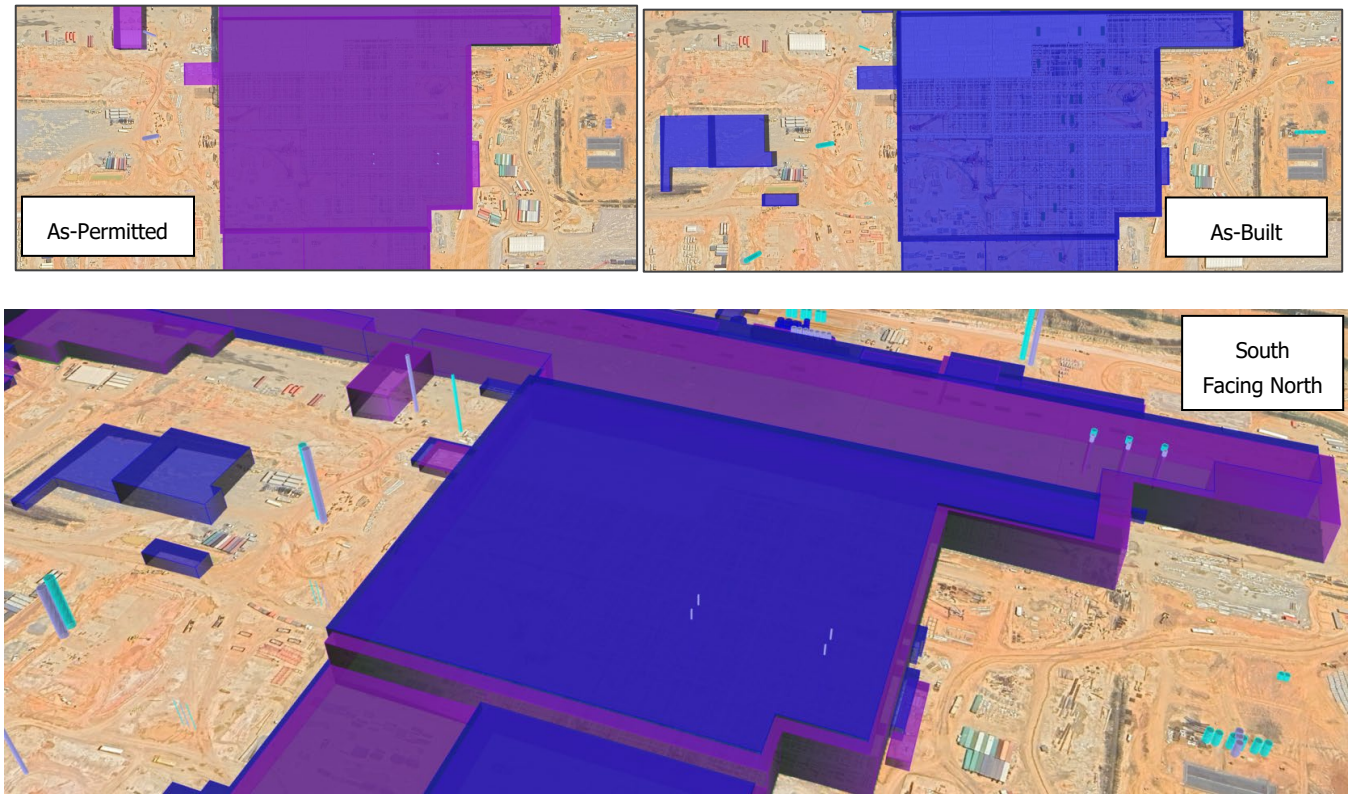


Figure 5-3. Melter-Holder Hot Baghouse Combined Stack (MHHBH) As-Permitted vs. As-Built Downwash Parameter Comparison (3D/ View)

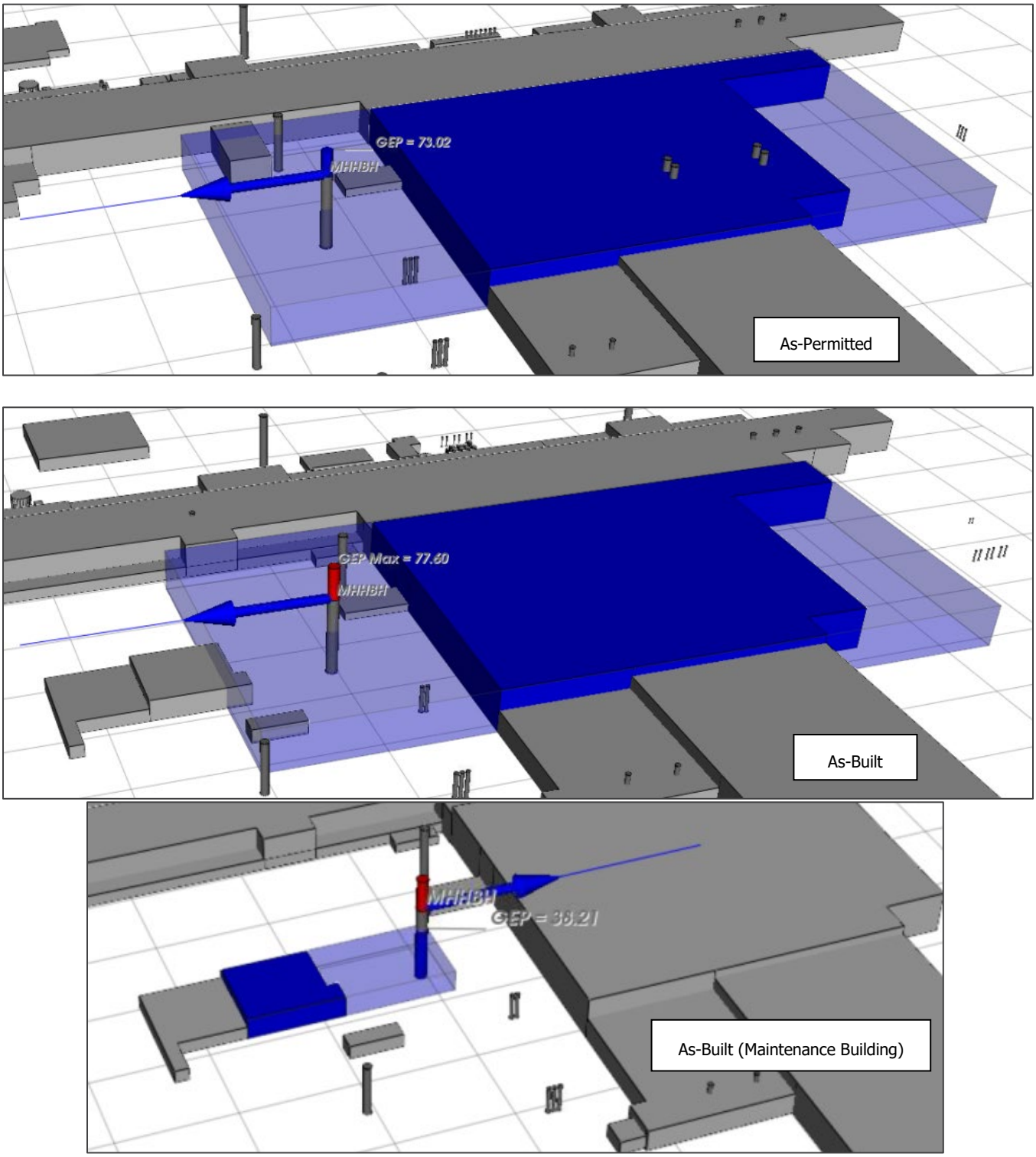


Table 5-1. As-Permitted Modeling Input Parameters for Melting & Casting Area Point Sources

Model ID	Emission Point Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
DSWHBH	DCTR1, DCTR2, DCTR3, SW1, SW2, SW3, SW4, DRSH Decoater-Sidewell Hot Baghouse Combined Stack	428,900.41	3,424,174.52	265.0	V	120.0	226.1	843,700	66.7	16.39
MHHBH	SW5, NDC1, RT1, RT2, HF1, HF2, HF3, HF4, ILD1, ILD2, ILD3, DP1, DP2, DP3, DP4 Melter-Holder Hot Baghouse Combined Stack	428,984.06	3,424,296.78	265.0	V	180.0	208.5	645,700	66.7	14.34
SWDRY1	Sow Dryer #1 Stack	429,102.15	3,424,106.68	270.0	V	72.2	752.0	10,000	6.6	5.67
SWDRY2	Sow Dryer #2 Stack	429,076.10	3,424,107.00	270.0	V	72.2	752.0	10,000	6.6	5.67
LMS1	Hot Baghouses Lime Silos (6)- Silo #1 Vent	429,003.07	3,424,142.91	265.0	V	61.8	0.0	1,000	84.9	0.50
LMS2	Hot Baghouses Lime Silos (6)- Silo #2 Vent	429,006.65	3,424,142.71	265.0	V	61.8	0.0	1,000	84.9	0.50
LMS3	Hot Baghouses Lime Silos (6)- Silo #3 Vent	429,010.51	3,424,142.73	265.0	V	61.8	0.0	1,000	84.9	0.50
LMS4	Hot Baghouses Lime Silos (6)- Silo #4 Vent	429,018.56	3,424,235.96	265.0	V	61.8	0.0	1,000	84.9	0.50
LMS5	Hot Baghouses Lime Silos (6)- Silo #5 Vent	429,022.14	3,424,235.76	265.0	V	61.8	0.0	1,000	84.9	0.50
LMS6	Hot Baghouses Lime Silos (6)- Silo #6 Vent	429,026.00	3,424,235.78	265.0	V	61.8	0.0	1,000	84.9	0.50

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment. A 0 deg. F temperature is used to flag an ambient release (based on inputting 0 K to AERMOD to trigger this option). A -10 deg. F temperature is assigned to represent a cooling tower release temperature that is 10 deg. F below ambient temperature.

Table 5-2. As-Built Modeling Input Parameters for Melting & Casting Area Point Sources

Model ID	Emission Point Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
DSWHBH	DCTR3, DCTR2, DCTR1, SW5, SW4, SW2, SW1, DRSH Decoater-Sidewell Hot Baghouse Combined Stack	428,898.40	3,424,181.91	265.0	V	120.0	216.6	843,700	62.0	17.00
MHHBH	SW3, NDC1, RT2, RT1, HF4, HF3, HF2, HF1, ILD4, ILD2, ILD1 Melter-Holder Hot Baghouse Combined Stack	428,980.37	3,424,299.10	265.0	V	180.0	201.8	645,700	62.3	14.83
SWDRY2	Sow Dryer #2 Stack	429,094.79	3,424,107.27	270.0	V	72.0	800.0	13,683	18.1	4.00
SWDRY1	Sow Dryer #1 Stack	429,126.43	3,424,106.74	270.0	V	72.0	800.0	13,683	18.1	4.00
LMS1	Hot Baghouses Lime Silos (5)- Silo #1 Vent	429,046.52	3,424,323.81	265.0	V	61.8	Amb.	1,000	84.9	0.50
LMS2	Hot Baghouses Lime Silos (5)- Silo #2 Vent	429,044.55	3,424,273.50	265.0	V	61.8	Amb.	1,000	84.9	0.50
LMS3	Hot Baghouses Lime Silos (5)- Silo #3 Vent	428,983.09	3,424,206.64	265.0	V	61.8	Amb.	1,000	84.9	0.50
LMS4	Hot Baghouses Lime Silos (5)- Silo #4 Vent	428,982.98	3,424,186.10	265.0	V	61.8	Amb.	1,000	84.9	0.50
LMS5	Hot Baghouses Lime Silos (5)- Silo #5 Vent	428,982.85	3,424,160.16	265.0	V	61.8	Amb.	1,000	84.9	0.50
DSS1	Cold Baghouse Dry Sorbent Silos (2)	429,030.85	3,424,052.06	265.0	V	61.8	Amb.	1,000	84.9	0.50
DSS2	Cold Baghouse Dry Sorbent Silos (2)	429,030.68	3,424,014.76	265.0	V	61.8	Amb.	1,000	84.9	0.50

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment. A 0 deg. F temperature is used to flag an ambient release (based on inputting 0 K to AERMOD to trigger this option). A -10 deg. F temperature is assigned to represent a cooling tower release temperature that is 10 deg. F below ambient temperature.

6. HOT ROLLING AREA CHANGES

6.1 Process Equipment Changes

6.1.1 Updates to As-Permitted Process Equipment Specifications

With the exception of a maximum hourly process rate change for the Ingot Scalper (HR-02), there are no material changes to the core functionality and engineering design specifications of the process equipment associated with the remaining Hot Mill process area emission units with the as-built engineering design updates. As documented in Section 15 of **Appendix C**, the maximum hourly ingot processing rate for the Ingot Scalper has been increased from 11 ingot/hr to 13.5 ingot/hr to reconcile this operating parameter with the final vendor-supplied equipment specifications. The proposed annual operating limitation for the Ingot Scalper remains unchanged between the as-permitted and as-built potential emission calculations, such that the Ingot Scalper's hourly capacity change does not translate into a corresponding annual process rate change.

6.1.2 Removal of As-Permitted Equipment

6.1.2.1 Removal of Hot Rolling Ingot Saws

As documented in the as-built Emission Unit Index provided in **Appendix AAppendix B**, the Hot Rolling Ingot Saws (4) (HR-01) have been removed from the project scope because the planned ingot cutting operations for this equipment are no longer needed to meet customer specifications.

6.1.2.2 Replacement of Scalper Chip Handling Systems Routed to Sidewell Furnaces

The planned approach for managing scalper chips by routing them via a Scalper Chip Handling System Pneumatic Conveyor to four (4) Sidewell Melting Furnaces (HR-03 to HR-06) has been replaced with the installation of a briquetting operation equipment with its own Scalper Chip Handling System Pneumatic Conveyor (redesignated HR-03).

6.1.3 Addition of New Emission Units

As described in **Section 2.3.3.2**, the new briquetting system consists of an induced draft fan to pneumatically convey chips from any of the chips bins to a production collection cyclone equipped with a hopper. From the hopper, collected scalper chips are fed to the briquetting machine via an enclosed conveyor and the final briquettes are discharged on to an open conveyor feeding scrap tubs. The product collection cyclone exhaust air discharge is routed to the main Ingot Scalper Filtration Unit stack, but Novelis has conservatively chosen not to include the additional PM removal offered by this filtration unit to offer flexibility to directly exhaust the product collection cyclone discharge directly to atmosphere if necessary to accommodate filtration unit maintenance or other types of outages when the filtration unit is not available for use.

6.2 Control Device Changes

6.2.1 Ingot Scalper Filtration Unit Changes

As documented in Section 15 of **Appendix C**, the Ingot Scalper Filtration Unit flow capacity has decreased from 114,000 acfm in the as-permitted configuration to 78,063 acfm in the as-built configuration (~30%

reduction in flow capacity) which results in a corresponding decrease in hourly potential PM/PM_{10}/$PM_{2.5}$ and VOC emissions. The flow capacity of the Ingot Scalper Filtration Unit in the as-built configuration has been reconciled to the final specifications from the selected equipment vendor.

6.2.2 Hot Reversing Mill Mist Eliminator Changes

As documented in Section 18 of **Appendix C**, the design exhaust flow capacity for the HRM Mist Eliminator #1 has increased by a very small amount (7,500 acfm, or ~4%) from 210,000 acfm in the as-permitted configuration to 217,500 acfm in the as permitted configuration. However, the nominal operating temperature of the HRM mist eliminator has increased from 95.6 deg. F in the as-permitted configuration based on a similar source stack test to 130 deg. F in the as-built configuration based on the vendor's engineering design basis which causes the dry standard volumetric flow rate used in the filterable PM/PM_{10}/$PM_{2.5}$ emission factor derivation to decrease by a small amount (from 191,380 dscfm in as-permitted configuration to 186,651 dscfm in the as-built configuration or a ~3% decrease). Regardless, the basic operating details/functionality and planned filterable PM emissions performance remains unchanged between the as-permitted and as-built configurations.

6.2.3 Hot Finishing Mill Mist Eliminator Changes

As documented in Section 19 of **Appendix C**, the HFM mist eliminator nominal operating temperature has been changed from 107.5 deg. F in the as-permitted configuration based on a similar source stack test to 130 deg. F in the as-built configuration based on the vendor's engineering design basis. Although the actual volumetric flow capacity of the HFM mist eliminator has not changed between the as-permitted and as-built configurations, the as-built update to the nominal operating temperature causes the dry standard volumetric flow rate used in the filterable PM/PM_{10}/$PM_{2.5}$ emission factor derivation to decrease by a small amount (from 385,463 dscfm in as-permitted configuration to 370,755 dscfm in the as-built configuration or a ~4% decrease).

6.3 Air Emissions Changes

6.3.1 Scalper Air Emissions Quantification

As documented in Section 15 of **Appendix C** and summarized in Table 1-1.3 of **Appendix C**, the changes to the Ingot Scalper Filtration unit flow capacity and hourly ingot processing rate collectively produce a small annual potential PM/PM_{10}/$PM_{2.5}$ emissions decrease (<0.9 tpy).

6.3.2 Scalper Chip Handling System and Conveyer Air Emissions Quantification

As documented in Section 16 of **Appendix C**, the only regulated air pollutants expected to be emitted by the briquetting system are PM and trace levels of metallic HAP compounds found in PM. The source of filterable PM emissions from the briquetting system is the exhaust air discharge from the product collection cyclone for any suspended particles which are not collected with the scalper chips discharged into the hopper. Condensable PM emissions will result from potential vaporization of residual ingot scalper lubricant on the surface of the scalped chips which subsequently condenses into liquid aerosols as the exhaust air cools in the chip collection and conveyance system. Potential emissions for filterable and condensable PM are estimated using the exit grain loading from July 2016 engineering testing of a Swarf Chip Conveyor process cyclone operation at another similar aluminum facility after accounting for the higher collection efficiencies of the new briquetting system cyclones in comparison to the older, existing Swarf Furnace Chip Conveyor cyclone. The expected exit grain loading associated with the process cyclones is converted to a mass emission rate using the flow capacity of the cyclones and then to a production-based emission factor

using the rated aluminum throughput capacity of the scalper chip handling system. Filterable PM emissions are speciated into filterable PM_{10} and filterable $PM_{2.5}$ size fractions based on the particle size distribution data reported in the Swarf Chip Conveyor cyclone July 2016 engineering test. The particle size analysis technique used for the engineering test was a scanning electron microscopic (SEM) analysis of the Method 5 filter and probe rinse. Filterable $PM_{2.5}$ emissions are conservatively assumed to equal filterable PM_{10} emissions. No control efficiency is applied for any additional filterable PM removal in the Ingot Scalping Filtration Unit to allow for the operating flexibility to route the product collection cyclone's exhaust directly to atmosphere and to be consistent with the emission calculation methodology for the as-permitted set of four (4) Scalper Chip Handling System Pneumatic Conveyor planned to discharge scalper chips directly into the Sidewell Melting Furnaces. As summarized in Table 1-1.3 of **Appendix C**, the removal of three (3) Scalper Chip Handling System Pneumatic Conveyors and the repurposing of the remaining one (1) Scalper Chip Handling System Pneumatic Conveyor for Briquetter results in a decrease in annual potential PM emissions (2.5 tpy for PM and 1.3 tpy for $PM_{10}/PM_{2.5}$).

6.3.3 Pusher Furnace Air Emissions Quantification

As documented in Section 17 of **Appendix C**, no changes to hourly and annual potential emissions from the three (3) Pusher Furnaces (HR-07 through HR-09) have occurred through the as-built engineering design review process. However, updates to the applicable global warming potentials (GWP) for methane (CH_4) and nitrous oxide (N_2O) have been consistently carried through to all natural gas combustion systems included in the final as-built project scope.

6.3.4 Hot Reversing Mill Air Emissions Quantification

As documented in Section 18 of **Appendix C** and summarized in Table 1-1.3 of **Appendix C**, the change in HRM mist eliminator actual volumetric flow capacity and nominal operating temperature produce a very small change in annual potential $PM/PM_{10}/PM_{2.5}$ emissions (<0.3 tpy).

6.3.5 Hot Finishing Mill Air Emissions Quantification

As documented in Section 19 of **Appendix C** and summarized in Table 1-1.3 of **Appendix C**, the change in HFM mist eliminator nominal operating temperature produce a small change in annual potential $PM/PM_{10}/PM_{2.5}$ emissions (<0.8 tpy).

6.4 Suggested PSD Permit Changes

The following sections summarize the key PSD permit changes needed to reflect the as-built changes to emission unit naming, process equipment and control device engineering design and operating specifications, and corresponding potential emissions changes.

6.4.1 Scalper and Scalper Chip Handling System (X013) PSD Permit Changes

- Update all Ingot Scalper BACT limits expressed in units of lb/hr proposed by Novelis and summarized in **Appendix A** and the corresponding aluminum process rate normalized emission limits added by ADEM with reference to Section 15 of **Appendix C**.
- Remove all references to three (3) Scalper Chip Handling System Pneumatic Conveyors for Sidewell Melting Furnaces (HR-04, HR-05, and HR-06) and update naming for one remaining unit (HR-03) to match the emission unit description in the **Appendix A** Emission Unit Index of "Scalper Chip Handling System Pneumatic Conveyor for Briquetter."

- Update all Scalper Chip Handling System BACT limits expressed in units of lb/hr proposed by Novelis and summarized in **Appendix A** and the corresponding aluminum process rate normalized emission limits added by ADEM with reference to Section 16 of **Appendix C**.

6.4.2 Pusher Furnace (X014) PSD Permit Changes

- GHG BACT limit for Pusher Furnaces #1-#3 (HR-07 through HR-09) at Emissions Standard proviso No. 8 in the X014 PSD permit needs to be updated to match the revised annual potential emission rate for each furnace documented in Section 17.3.2 of **Appendix C** to reflect the GWP update.

6.4.3 Hot Reversing Mill (X015) PSD Permit Changes

- Update all HRM BACT limits for PM/PM_{10}/$PM_{2.5}$ expressed in units of lb/hr proposed by Novelis and summarized in **Appendix A**.

6.4.4 Hot Finishing Mill (X015) PSD Permit Changes

- Update all HRM BACT limits for PM/PM_{10}/$PM_{2.5}$ expressed in units of lb/hr proposed by Novelis and summarized in **Appendix A**.

6.5 BACT Determination

All proposed BACT limit changes are a function of as-built updates to process equipment and control device specifications and not an underlying change to the emission calculation methodology or reference emission factors applied. In these instances where a BACT limit is only being updated to reflect minor as-built design specification changes, the prior top-down BACT analysis presented in the original PSD permit application is still applicable and does not require an updated BACT determination. Therefore, none of the Hot Rolling process area BACT determinations are subject to reconsideration with this as-built PSD permit revision application.

6.6 Air Quality Analysis Updates

As shown in the "plot plan" (looking down) views in **Figure 6-1** and 3D/elevation (looking across) views in **Figure 6-2**, the primary as-built changes for the Hot Rolling process area with the potential to influence the air quality analysis include the following items. Refer to Figure A-2 in **Appendix A** for the overlayed building layout for the as-permitted and as-built Hot Rolling process area configurations:

- The east side of the main rolling mill building (MILLBLDG) changed shape and reduced in length along with the same small northwest shift noted in the prior discussions regarding the Scrap Processing and Melting & Casting process area buildings. The height of the main rolling mill building increased very slightly from 82.5 ft in the as-permitted configuration to 83.5 ft in the as-built configuration. The lower tier support buildings for the rolling mill changed from a non-continuous set of multi-tier structures in the as-permitted configuration to a continuous line of multi-tier structures in the as-built configuration. The heights for the low bay and high bay of these support buildings remained effectively the same between the as-built and as-permitted configuration. The layout of the "shed-type" buildings connected to the lower tier support buildings changes from a single structure in the as-permitted configuration (Electric Room 8 = EL8) to a series of two structures (BLDG27 and BLDG05) in the as-built configuration further to the west of the original building. In the as-built configuration, the building downwash structure previously associated with the General Plant Cooling Tower (COOLTWR) (renamed as the Hot Mill Cooling Tower CT1C1 to CT1C6 in the as-built configuration) has been removed due to the final

engineering design for all cooling tower structures containing an elevated, open side configuration that would not be subject to building downwash. In place of this building, a disconnected cooling tower support building and other storage tanks not directly associated with the cooling tower has been added in the as-built configuration between the HRM and HFM stacks.

  - Novelis has carefully reviewed the wind direction specific downwash parameter outputs from the relevant modeling pre-processor [Building Profile Input Program (BPIPPRIME), Version 04274] and has determined that the change in the layout of the support buildings and new disconnected structures do not become controlling downwash structures for any of the Ingot Scalper (SCLP1), Pusher Furnace (PF1 to PF3), HRM, and HFM stacks. Rather, the main mill building and melting/casting building (MELTCST) control the downwash calculations for the vast majority of the wind directions where downwash is active except for a very small sector where the lower tier support buildings are the controlling downwash structures (e.g., narrow wind sectors of only 2-3 degrees for winds out of the southeast and southwest affecting the HRM and HFM stacks).

- The Ingot Scalper Filtration Unit stack (SCLP1) shifted approximately 130 ft to the east-southeast between the as-permitted and as-built configuration. The Scalper Bay Loading building (SCLPBYLD) was removed from the as-permitted configuration. The Casting and Recycling Office (CSTRECYC) increased in length by approximately 30 ft, and a low roof height (~23 ft) support building was added to the north of the SCLP1 stack connected to the main mill building.

  - As shown in **Figure 6-3**, the removal of the Scalper Bay Loading building in the as-built configuration eliminates downwash effects for the SCLP1 stack for winds coming out of the west which would tend to have the effect of reducing modeled impacts. The longer Casting and Recycling Office and shift of the SCLP1 stack location in the as-built configuration introduces minor downwash effects for a narrow wind sector from the south which were not present in the as-permitted configuration. However, this due north downwind source-receptor distance is relatively large (~1.9 km) compared to other controlling $PM_{10}/PM_{2.5}$ impacts with wind directions from the southeast and southwest.

- The Pusher Furnace Stacks (PF1-PF3) shifted about 20 ft to the north between the as-built and as-permitted configuration at the same relative position within the main mill building.

  - The long-narrow main mill building acts as the controlling downwash structure for all wind directions at both the as-permitted and as-built PF1-PF3 stack locations, so the small shift in location is not expected to change the downwash influences for these stacks.

- The HRM stack shifted approximately 30 ft to the northwest in the same manner as the shift of the entire rolling mill building.

  - Review of the wind direction-specific building downwash parameters for this HRM stack location shift did not indicate any significant changes in controlling downwash structures or downwash intensity. Also, the absolute distance of the stack shift is not substantial relative to applicable source-receptor distances at the fenceline.

- The 150 ft HFM stack shifted approximately 60 ft to the east-northeast in the final as-built design configuration (i.e., not the same general northwest shift of other Hot Rolling area stacks associated with the main mill building shift). The shifted HFM stack location is in the vicinity of the newly added support buildings (i.e., buildings that are disconnected from the main mill building). However, the closest added support building (BLDG33) has a maximum roof height of only ~18 ft (only about 12% of the HFM stack height) which prevents its 5L-based downwash influence zone from reaching the HFM stack.

- Similar to the HRM stack re-location review conclusions, the shifted HFM stack location does not substantively change any downwash effects and is not sufficiently large enough to substantively reduce controlling source-receptor distances.

- As shown in **Table 6-1** and **Table 6-2**, all of the Hot Rolling process area stack heights remained effectively the same between the as-permitted and as-built configuration with only a very small reduction in height of the PF1-PF3 stacks (from 100 ft in the as-permitted configuration to 98 ft in the as-built configuration). The SCLP1 stack temperature remained unchanged, but the stack diameter decreased to coincide with a significant reduction in stack flow rate, resulting in a stack velocity increase from the as-permitted to as-built configurations. The PF1-PF3 stacks decreased in temperature and exit velocity and increased in stack diameter. The HRM stack increased in stack temperature, flow rate, and exit velocity while retaining the same diameter. Finally, the HFM stack increased in temperature and exit velocity and decreased in diameter.
  - With the exception of the PF1-PF3 stack parameter changes, all of the as-built stack parameter updates for the Hot Rolling area are relatively minor and would generally tend to increase plume rise and improve dispersion. The PF1-PF3 reduction in stack temperature and exit velocity generally would decrease plume rise, but the increase in stack diameter is expected to spread the plume across a wider initial area potentially having an offsetting effect from the loss in plume rise. Regardless, the Pusher Furnaces are solely sources of standard natural gas combustion byproduct emissions, with burners achieving the BACT level of emissions performance, and are not known to be significant contributors of emissions impacts for the Bay Minette facility's maximum impact locations for any specific criteria pollutant or averaging period.

Figure 6-1. Hot Rolling Area As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View)

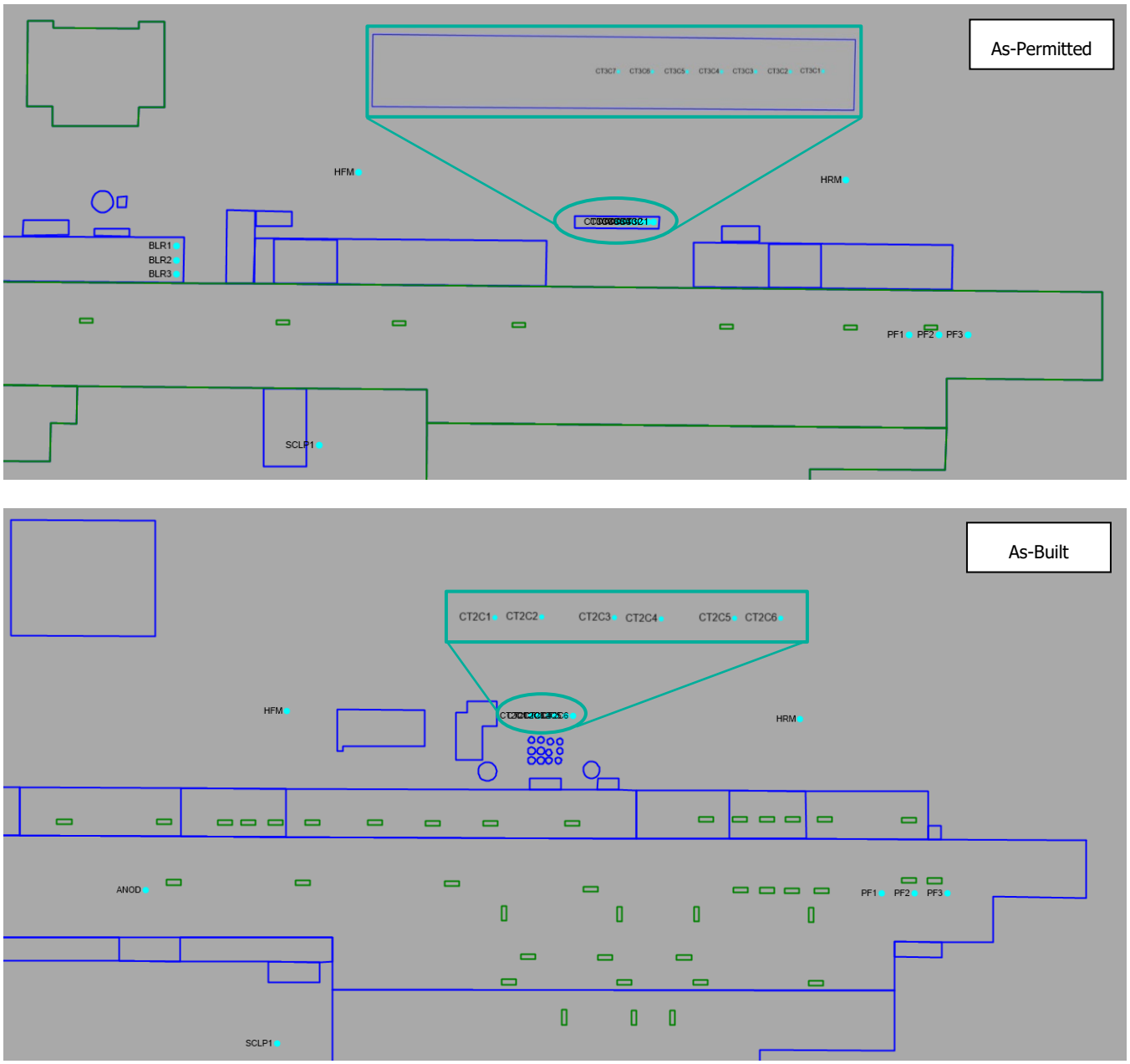


Figure 6-2. Hot Rolling Area As-Permitted vs. As-Built Modeling Setup Comparison (3D/Elevation View)

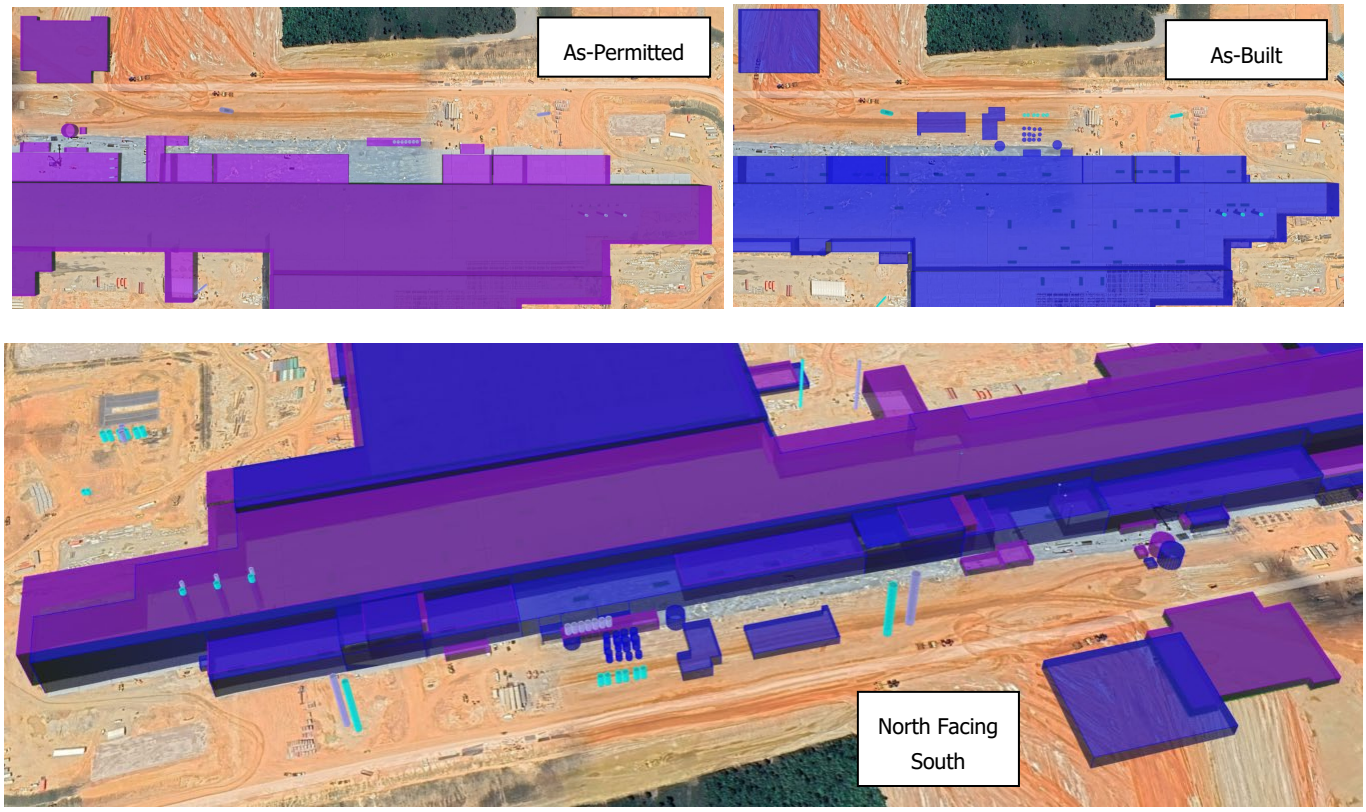


Figure 6-3. Ingot Scalper Stack (SCLP1) As-Permitted vs. As-Built Downwash Parameter Comparison (3D/ View)

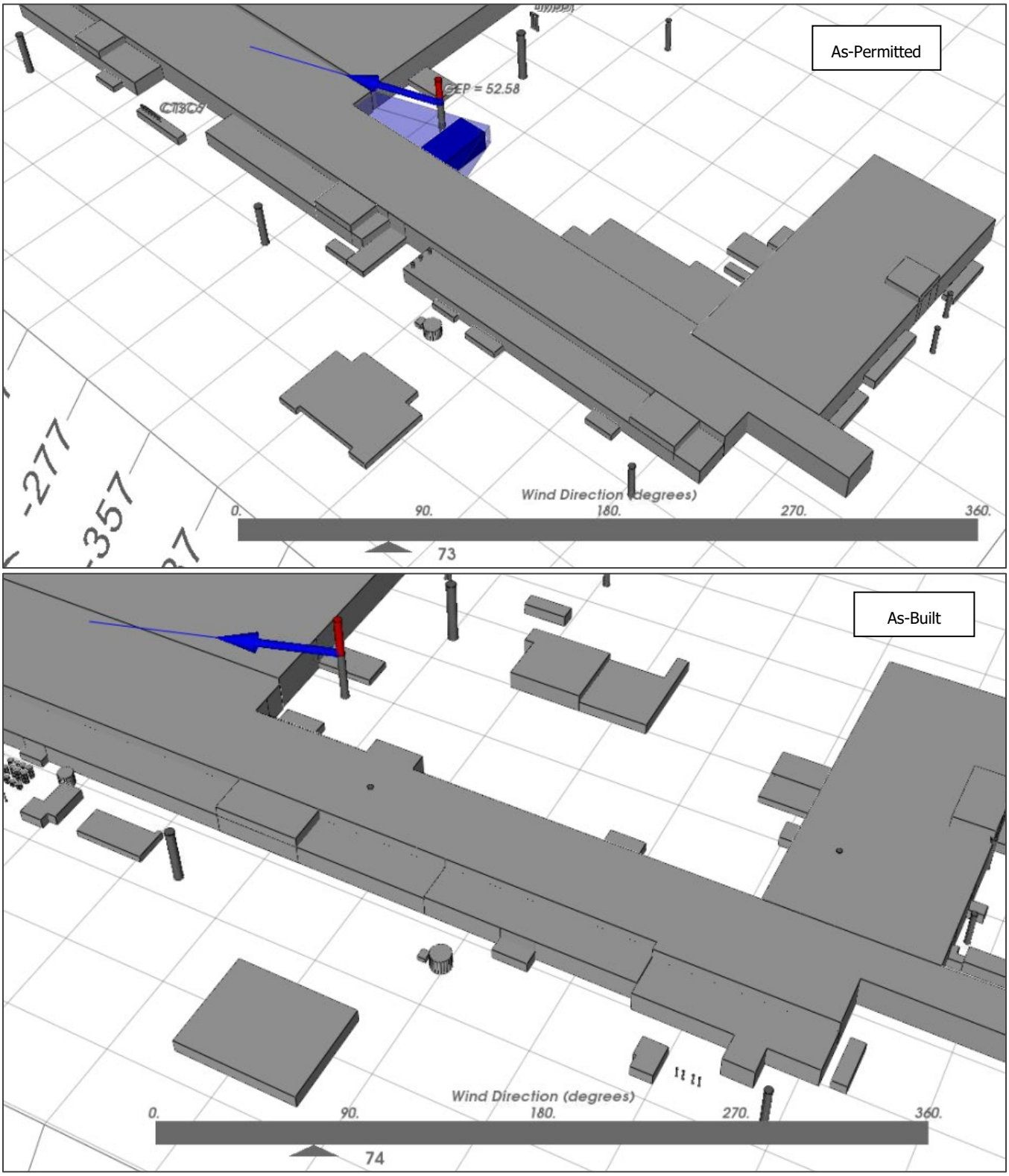


Table 6-1. As-Permitted Modeling Input Parameters for Hot Rolling Area Point Sources

Model ID	Emission Point Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
SCLP1	Scalper #1 Filtration Unit Stack	428,983.44	3,424,409.09	265.0	V	145.0	80.0	114,000	41.8	7.61
PCSW1	Scalper Chip Handling System Pneumatic Conveyor-Sidewell Melting Furnace #1 (Flex Line) Cyclone Stack	429,226.02	3,424,265.17	270.0	V	123.8	0.0	11,000	43.0	2.33
PCSW2	Scalper Chip Handling System Pneumatic Conveyor-Sidewell Melting Furnace #2 (Flex Line) Cyclone Stack	429,226.06	3,424,275.66	270.0	V	123.8	0.0	11,000	43.0	2.33
PCSW3	Scalper Chip Handling System Pneumatic Conveyor-Sidewell Melting Furnace #3 (CBS Line) Cyclone Stack	429,295.32	3,424,264.24	270.0	V	123.8	0.0	11,000	43.0	2.33
PCSW4	Scalper Chip Handling System Pneumatic Conveyor-Sidewell Melting Furnace #4 (CBS Line) Cyclone Stack	429,295.71	3,424,275.00	270.0	V	123.8	0.0	11,000	43.0	2.33
PF1	Pusher Furnace #1 Stack	429,405.29	3,424,488.16	265.0	V	100.0	600.0	37,444	12.7	7.92
PF2	Pusher Furnace #2 Stack	429,426.59	3,424,487.93	265.0	V	100.0	600.0	37,444	12.7	7.92
PF3	Pusher Furnace #3 Stack	429,447.41	3,424,487.93	265.0	V	100.0	600.0	37,444	12.7	7.92
HRM	Hot Reversing Mill Stack	429,360.21	3,424,598.48	265.0	V	150.0	100.0	210,000	30.9	12.00
HFM	Hot Finishing Mill Stack	429,011.65	3,424,604.18	265.0	V	150.0	107.5	435,000	28.5	18.00

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment. A0 deg. F temperature is used to flag an ambient release (based on inputting 0 K to AERMOD to trigger this option). A-10 deg. F temperature is assigned to represent a cooling tower release temperature that is 10 deg. F below ambient temperature.

Table 6-2. As-Built Modeling Input Parameters for Hot Rolling Area Point Sources

Model ID	Emission Point Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
SCLP1	Scalper #1 Filtration Unit Stack	429,021.82	3,424,398.22	265.0	V	145.0	80.0	78,063	54.8	5.50
~~PCSW2~~	~~Scalper Chip Handling System Pneumatic Conveyor-Sidewell Melting Furnace #2 (Flex Line) Cyclone Stack~~									
~~PCSW3~~	~~Scalper Chip Handling System Pneumatic Conveyor-Sidewell Melting Furnace #3 (CBS Line) Cyclone Stack~~									
~~PCSW4~~	~~Scalper Chip Handling System Pneumatic Conveyor-Sidewell Melting Furnace #4 (CBS Line) Cyclone Stack~~									
PF1	Pusher Furnace #1 Stack	429,405.74	3,424,493.78	265.0	V	98.0	482.0	74,378	14.3	10.50
PF2	Pusher Furnace #2 Stack	429,426.46	3,424,493.68	265.0	V	98.0	482.0	74,378	14.3	10.50
PF3	Pusher Furnace #3 Stack	429,447.13	3,424,493.70	265.0	V	98.0	482.0	74,378	14.3	10.50
HRM	Hot Reversing Mill Stack	429,353.87	3,424,603.88	265.0	V	150.0	130.0	217,500	32.1	12.00
HFM	Hot Finishing Mill Stack	429,028.20	3,424,609.17	265.0	V	150.0	130.0	435,000	31.9	17.00

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment. A0 deg. F temperature is used to flag an ambient release (based on inputting 0 K to AERMOD to trigger this option). A-10 deg. F temperature is assigned to represent a cooling tower release temperature that is 10 deg. F below ambient temperature.

7. COLD ROLLING AREA CHANGES

7.1 Process Equipment Changes

7.1.1 Updates to As-Permitted Process Equipment Specifications

The basic engineering design and operating details of the Tandem Cold Mill (CR-01) have not changed between the as-permitted and as-built configuration. However, final equipment specifications, process modeling, and production forecasts have resulted in the need for a few changes to the maximum short-term and annual throughput rates to more appropriately reflect the maximum capability of the TCM with the actual projected mix of hot rolled coil products planned to be processed by the TCM for the business portfolio expected for the first years of operations at the Bay Minette facility.

Specifically, the maximum throughput product on a short-term basis has been updated from an assigned process rate of 231.5 ton/hr in the as-permitted configuration to 310 ton/hr associated with processing the thicker gauge and highest individual coil weights associated with automotive coil products that may be produced in the first five (5) years of plant operations. Similarly, the annual average process rate and assumed TCM operating time used in deriving the proposed annual operating limitation have been updated for the as-built engineering design basis and operating profile (from 114.2 ton/hr and continuous annual operation for the as-permitted configuration to 158 ton/hr at maximum expected annual operating hours for the as-built configuration). This adjustment to the annual process rate assigned to the TCM produces a relatively small increase in the proposed annual operating limit (from 999,428 tpy to 1,099,680 tpy, or a 10% increase).

7.2 Control Device Changes

The nominal operating temperature of the TCM Mist Eliminator with an associated refrigerated condenser has been updated from 71.2 deg. F in the as-permitted configuration based on a similar source stack test during wintertime conditions to a more representative basis of 74.7 deg. F in the as-built configuration reflecting the current engineering design basis of the condenser system as supplied by the equipment vendor for atmospheric conditions expected in the local area.

7.3 Air Emissions Changes

As documented in Section 20 of **Appendix C**, the change in the nominal operating temperature of the mist eliminator results in a small change (~3%) in the dry standard volumetric flow capacity of the TCM Mist Eliminator between the as-permitted to the as-built configuration (from 137,468 dscfm in the as-permitted configuration to 136,568 dscfm in the as-built configuration). The change in TCM Mist Eliminator flow capacity produces a slight corresponding change in the hourly potential PM/PM_{10}/$PM_{2.5}$ emissions. With the update to the maximum short-term process rate for the TCM discussed above causing an even wider disparity between the annual average hourly process rate used in the derivation of the proposed annual operating limit under the as-built configuration, Novelis has identified the need to assign two separate sets of TCM potential emissions factors with the short-term emission factor using the maximum short-term process rate as the normalizing process variable and the long-term emission factor using the annual average hourly process rate. The mass per time-based hourly potential emission rate for the TCM is based solely on the outlet pollutant concentrations and the flow capacity of the fume exhaust system. Therefore, normalizing this same maximum hourly mass emission rate to the short-term process rate and then applying this resultant emission factor to the limited annual process rate for the TCM would tend to significantly

underestimate annual potential emissions. This same issue applied to the as-permitted TCM potential emission calculations, so Novelis is effectively seeking a correction to the underlying emission calculation basis for the TCM with this as-built PSD permit revision to rectify this inadvertent underestimation of the TCM annual potential emission rates. As summarized in Table 1-1.3 of **Appendix C**, the change in assigned short-term and annual TCM process rates, minor update to the TCM mist eliminator flow capacity and nominal operating temperature, and new method for separately deriving short-term and long-term TCM emission factors collectively produce a relatively small increase in PM/PM_{10}/$PM_{2.5}$ emissions (3.0 tpy filterable PM, 2.8 tpy total PM_{10}, and 2.5 tpy total $PM_{2.5}$) and a moderate increase in calculated VOC emissions (31.5 tpy). When viewed in comparison to the source-wide annual potential VOC emissions for the Bay Minette facility, the as-built increase in TCM annual potential VOC emissions (due almost entirely due to introducing a modified approach to the emission calculation methodology) represents a small increase on a percentage basis (~4.8%).

7.4 Suggested PSD Permit Changes

The following list summarizes the key PSD permit (X017) changes needed to reflect the as-built changes to process equipment and control device engineering design and operating specifications and corresponding potential emissions changes for the TCM.

- Update the short-term TCM PM/PM_{10}/$PM_{2.5}$ BACT limits expressed in units of lb/hr proposed by Novelis and summarized in **Appendix A.**
- Add annual PM/PM_{10}/$PM_{2.5}$ BACT limits expressed in units of ton/yr on a 12-month rolling total basis to reflect the as-built annual potential emissions documented in Section 20 of **Appendix C**. Based on introducing a separate long-term average set of PM/PM_{10}/$PM_{2.5}$ emission factors, the annual operating limit for the TCM is no longer adequately enforceable as the sole basis for ensuring the annual potential PM/PM_{10}/$PM_{2.5}$ emissions are not exceeded in practice. ADEM had already introduced this type of annual BACT limit for VOC emissions at Emissions Standard proviso No. 7, so this requested addition of similar annual PM/PM_{10}/$PM_{2.5}$ BACT limits would also introduce consistency across all of the regulated NSR pollutants generated by the TCM.
- Update the short-term TCM VOC BACT limits expressed in units of lb/hr proposed by Novelis and summarized in **Appendix A** and the corresponding aluminum process rate normalized (lb/ton) emission limits added by ADEM with reference to Section 20 of **Appendix C**.
- Update the annual TCM VOC BACT limit based on a 12-month rolling total to match the as-built annual potential emissions presented in Section 20 of **Appendix C**.

7.5 BACT Determination

With no substantive changes to the design specifications or pollutant emissions performance of the selected TCM mist eliminator with integral condenser selected as the BACT level control option for total PM and VOC emissions control, the as-built changes generally do not warrant a revisiting of the full 5-step, top-down BACT review process. However, Step 4 of the PM/PM_{10}/$PM_{2.5}$ and VOC BACT analysis for evaluating the economic, environmental, and energy impacts of the highest ranked control options did include control cost analyses with the potential to be impacted by the as-built changes to the TCM annual potential emission calculations. The following sections provide updated versions of the Step 4 economics impacts analysis for the TCM PM/PM_{10}/$PM_{2.5}$ and VOC BACT analysis.

7.5.1 Updated Economic, Environmental, and Energy Impacts of PM/PM_{10}/$PM_{2.5}$ Control Technologies for Cold Rolling Mill

Based on the ranking provided in Step 3 in **Section 6.3.8** of the original PSD application, wet scrubbers are considered the most efficient technically feasible control option. However, Novelis' proposed design for the Tandem Cold Mill exhaust systems already implements a pseudo-scrubbing technology to capture and control PM emissions; therefore, the actual control efficiency provided by a subsequent scrubber system is likely to be on the lower end of this range.

Using the same control cost evaluation techniques applied to the hot rolling mills in **Section 6.4.7** of the original PSD application, the annualized control costs for installing a venturi scrubber to control PM emissions from the Tandem Cold Mill in the as-built configuration would be approximately $35,000 per ton of PM captured.[11] Therefore, a scrubber is not cost effective for the control of PM emissions from the Tandem Cold Mill in the as-built configuration and continues to be eliminated from BACT consideration. This determination is supported by the RBLC results presented in **Appendix F** of the original PSD application**,** which demonstrate that a wet scrubber has not been identified as BACT for controlling PM emissions from a cold rolling mill that uses a water-based oil emulsion as the roll coolant medium. Furthermore, the implementation of a scrubber would result in the generation of an additional wastewater stream that would need to be treated and disposed of consuming other natural resources and consumption of energy and other chemicals for the additional treatment processes.

Since the next most efficient control technologies identified by Step 3 (i.e., mist eliminators for filterable PM emissions control and chilled condenser system for CPM emissions control) will be implemented as BACT, no further discussion of economic, environmental, and energy impacts is needed for this BACT assessment. Further, Novelis has chosen to include a chilled water condenser as part of the design for the Tandem Cold Mill as BACT for control of condensable PM from the mill.

7.5.2 Updated Economic, Environmental, and Energy Impacts of VOC Control Technologies for Cold Rolling Mill

As shown in the updated cost calculations presented in Sections I-7 to I-9 of **Appendix I** for the TCM, Novelis has quantified the costs of implementing add-on control technologies to control VOC emissions from the exhaust of the TCM in its as-built configuration using EPA's default cost estimation spreadsheets published with the 7th edition of the Control Cost Manual (CCM). Novelis has prepared the control cost evaluations using the design capture efficiency of 95% for the TCM fume exhaust system and the VOC emissions profile after the chilled condenser in the CPM removal train to ensure the cost effectiveness determinations consider the amount of captured and collected VOC emissions, which could be reasonably transported to a VOC control device after the initial PM removal train needed for PM pre-treatment. Note that the chilled water condenser in the PM removal train could not be replaced by a refrigerated condenser to increase VOC removal efficiency, because the operating temperature of a refrigerated condenser would result in issues with water vapor freezing and hydrocarbons "gelling" on the condenser coils. Any design that would include refrigerated condensation would require pretreatment of the exhaust stream through a chilled condenser or other control device to reduce the issues associated with operating a refrigerated condenser on an exhaust stream with the properties associated with the TCM. Therefore, Novelis has appropriately applied a VOC emission rate that accounts for whatever coincidental VOC emissions removal that may reasonably be expected to occur in the chilled condenser control train (or any similar control device operation) targeting CPM emissions removal.

[11] For the Tandem Cold Mill, the scrubber cost effectiveness is calculated as follows: ($11.57 per scfm x 136,568 dscfm)/(57.2 tpy filt. PM generated x 80% PM control eff.) = $34,546/ton.

Design parameters for these analyses were chosen based on worst-case short term flow rates and emissions, while the annual emissions were used to determine the viability on a cost per ton of emissions basis. Since additional PM pre-treatment (e.g., a wet ESP control system) is likely necessary to implement a RTO, refrigerated condensation system, and carbon adsorption system for cold rolling mill VOC emissions control, additional annualized capital costs and annual operating costs would be incurred that are not currently included in the **Appendix I** cost estimates. **Table 7-1** presents this VOC control cost evaluation for the TCM.

Table 7-1. VOC Control Costs for Cold Rolling Mill in As-Built Configuration

Emission Unit	Control Technology	Cost Effectiveness ($/ton of VOC removed – 2022 dollars)[12]
Tandem Cold Mill	RTO	$25,983
	Refrigerated Condensation	$11,309
	Fluidized Bed Carbon Adsorption	$12,861
	Good Operating and Maintenance Practices	Undefined

As demonstrated by **Table 7-1**, the costs of implementing each remaining option to control VOC emissions from the TCM results in these technologies being deemed not cost effective. The high cost of these add-on control technologies in combination with the technical feasibility issues identified in Step 2 of the analysis (refer to **Section 9.2.6** of the original PSD application) renders each option infeasible. Documentation for the key input data and assumptions for the cold rolling mill VOC control cost calculations using EPA's automated spreadsheet tools are presented in **Appendix I**.

7.6 Air Quality Analysis Updates

As shown in the "plot plan" (looking down) views in **Figure 7-1** and 3D/elevation views in 3D/elevation (looking across) views in **Figure 7-2**, the primary as-built changes for the Cold Rolling process area with the potential to influence the air quality analysis include the following items. Refer to Figure A-3 of **Appendix A** for the overlayed building layout for the as-permitted and as-built Cold Rolling process area configurations:

- Various supporting buildings surrounding the TCM mist eliminator stack (TCM1) have resulted in some minor changes in shape, dimensions, and heights with the potential to possibly influence the downwash parameters for this single source associated directly with the Cold Rolling process area. The Cold Mill Utility building (CMILLUT) to the south of the TCM1 stack includes a north-south extension that falls within approximately 90 feet of the TCM1 stack at its closest point in the as-built configuration compared to a larger 130 ft distance from stack to the building edge in the as-permitted configuration. The as-permitted building height for the Cold Mill Utility building at its base tier was 52.3 ft with a high bay section (Cold Mill High Bay building = CMILLHBY) with a maximum roof height of 80.25 ft. In the as-built configuration, the Cold Mill Utility building with the north-south running extension increased slightly to 53.4 ft; however, the high bay building section has been removed. Other new support buildings in the

[12] Dollar value is conservatively held at 2022 to be consistent with all other control cost data presented in the original PSD application.

as-built configuration (BLDG06 with maximum roof height of 23.3 ft and BLDG07 with maximum roof height of 27.5 ft) are not sufficiently close enough to the TCM1 stack to fall within the 5L-based building downwash influence zone.

- As shown in **Figure 7-3**, the new configuration of the Cold Mill Utility building only affects the building downwash parameters for the TCM1 stack in a very narrow wind sector centered at a 302 deg. wind direction. The change in configuration of this building from the as-permitted to as-built configuration does not result in appreciably different downwash parameters or associated GEP values.

- As documented in **Table 7-2** and **Table 7-3**, the TCM1 stack height and flow rate remain unchanged between the as-permitted and as-built configuration. The stack temperature increased slightly (from 71.2 deg. F in the as-permitted configuration to 74.7 deg. F in the as-built configuration) which would generally increase plume rise by increasing the buoyancy flux. The relatively small increase in stack diameter (from 9 ft in the as-permitted configuration to 10.5 ft in the as-built configuration) with a fixed flow rate results in a corresponding decrease in the stack exit velocity (from 37.2 ft/s in the as-permitted configuration to 27.3 ft/s in the as-built configuration). For tall, large diameter stacks, momentum-based plume rise tends to have a less significant influence on predicted modeled impacts than other factors such as downwash intensity, source-receptor distances, and initial pollutant concentrations. These parameters essentially remain unchanged between the as-permitted and as-built configurations.

Figure 7-1. Cold Rolling Area As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View)

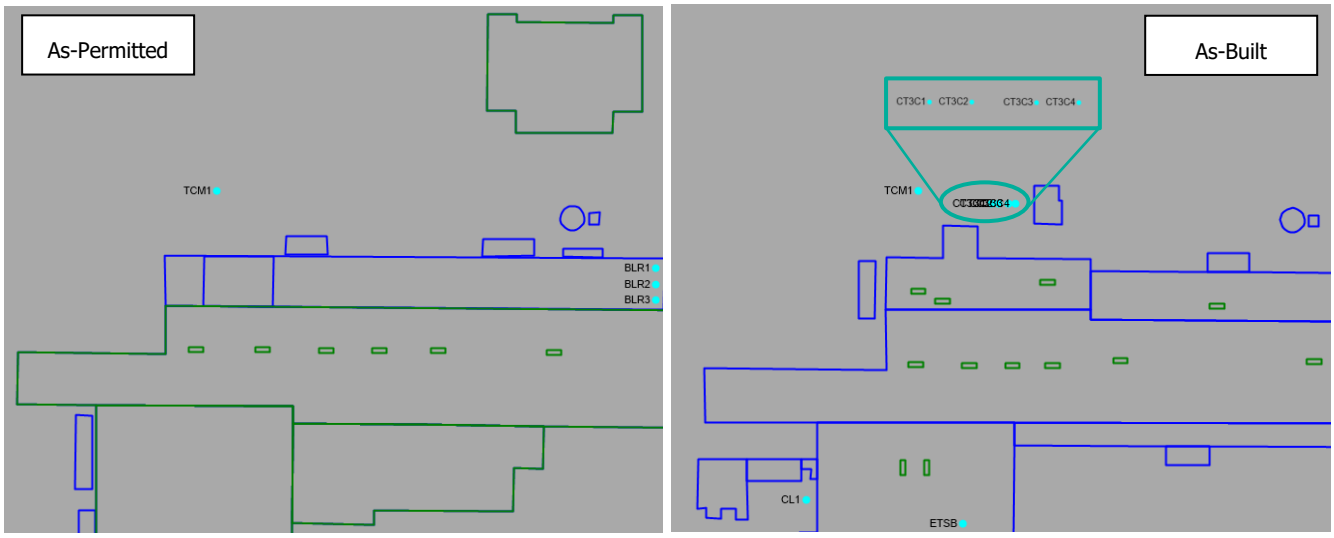


Figure 7-2. Cold Rolling Area As-Permitted vs. As-Built Modeling Setup Comparison (3D/Elevation View)

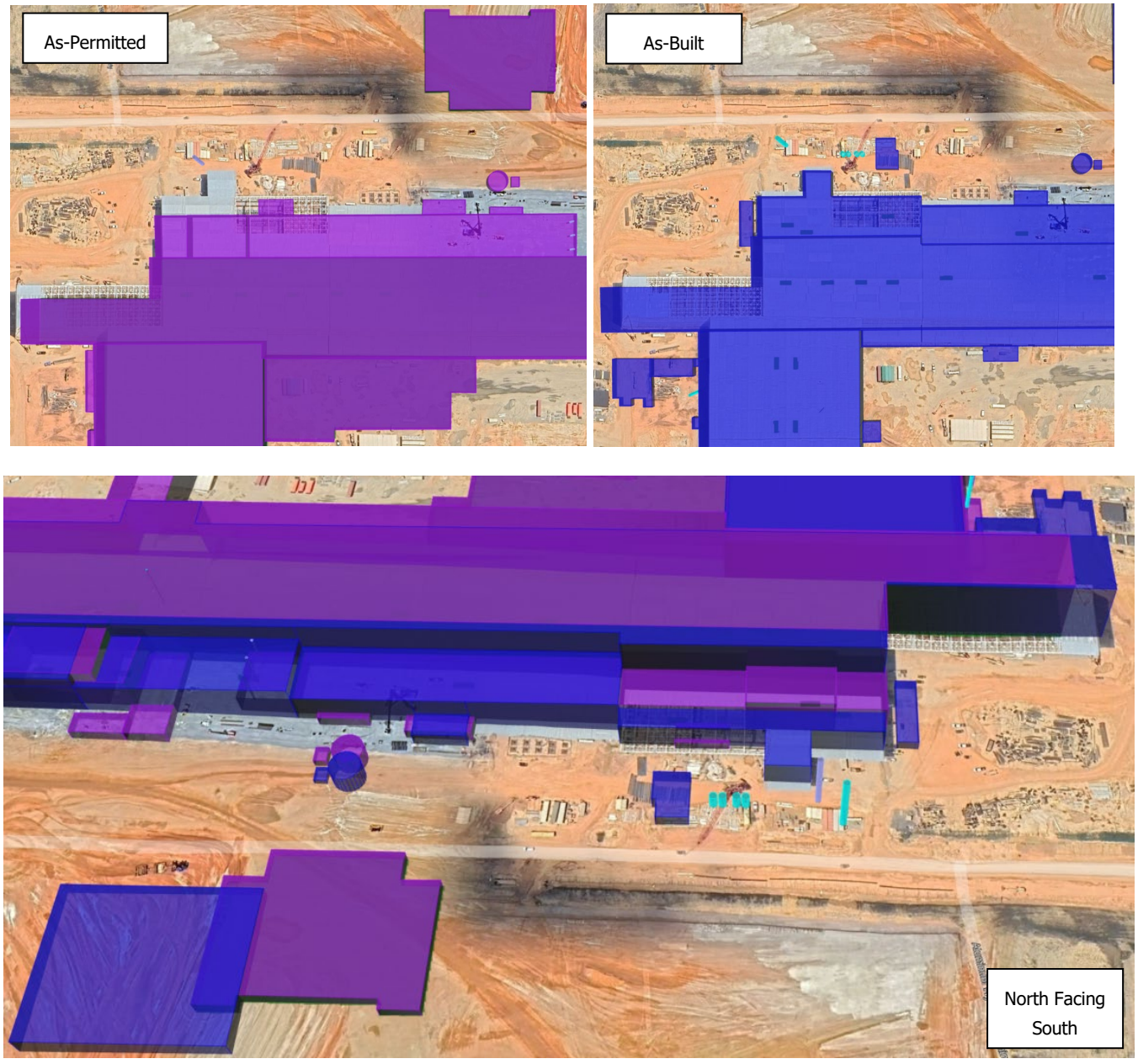


Figure 7-3. . TCM Stack (TCM1) As-Permitted vs. As-Built Downwash Parameter Comparison (3D/ View)

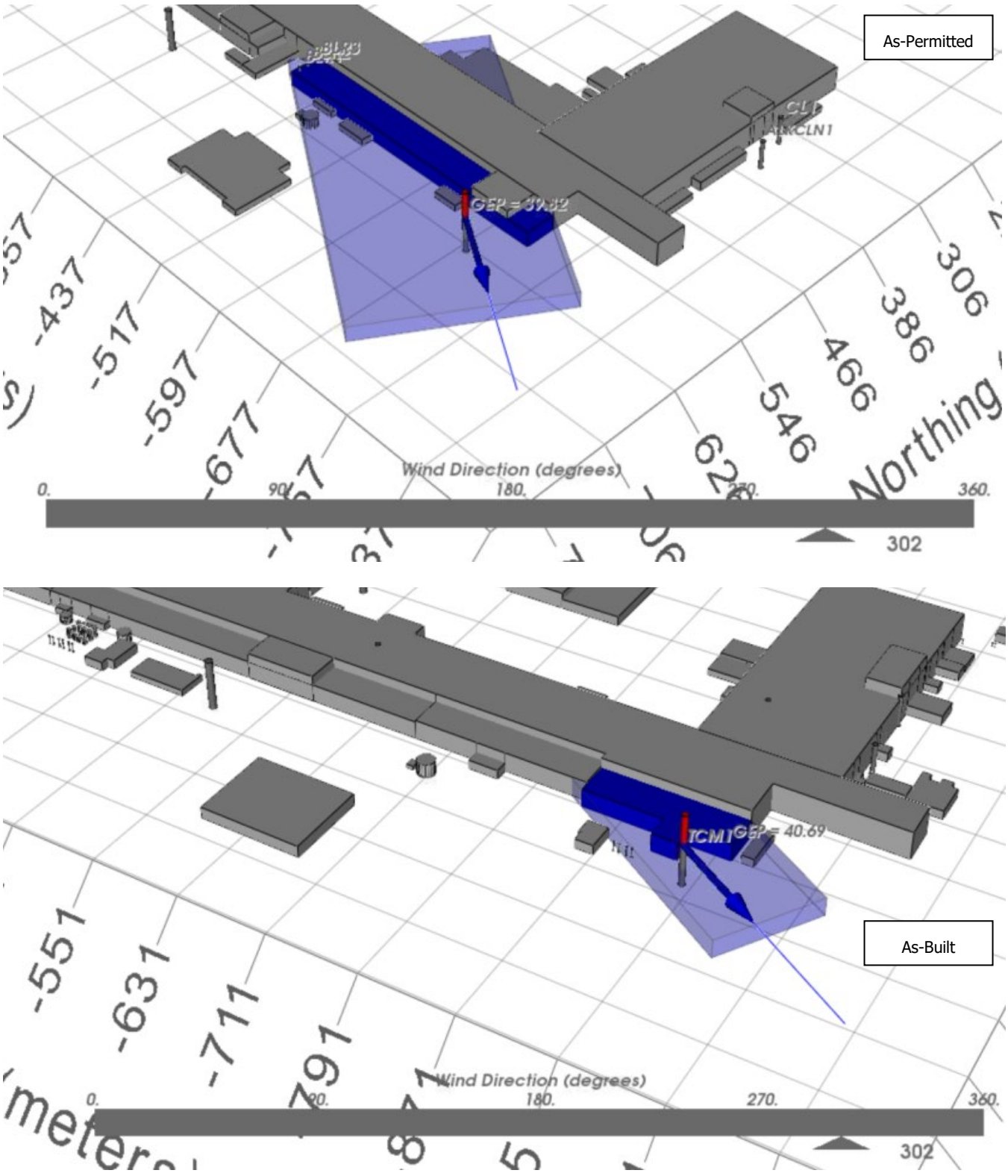


Table 7-2. As-Permitted Modeling Input Parameters for Cold Rolling Area Point Sources

Model ID	Emission Point Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
TCM1	Tandem Cold Mill #1 Stack	428,603.18	3,424,600.15	265.0	V	120.0	71.2	142,000	37.2	9.00

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment. A 0 deg. F temperature is used to flag an ambient release (based on inputting 0 K to AERMOD to trigger this option). A -10 deg. F temperature is assigned to represent a cooling tower release temperature that is 10 deg. F below ambient temperature.

Table 7-3. As-Built Modeling Input Parameters for Cold Rolling Area Point Sources

Model ID	Emission Point Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
TCM1	Tandem Cold Mill #1 Stack	428,591.51	3,424,612.36	265.0	V	120.0	74.7	142,000	27.3	10.50

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment. A 0 deg. F temperature is used to flag an ambient release (based on inputting 0 K to AERMOD to trigger this option). A -10 deg. F temperature is assigned to represent a cooling tower release temperature that is 10 deg. F below ambient temperature.

8. COIL FINISHING AREA CHANGES

8.1 Process Equipment Changes

8.1.1 Updates to As-Permitted Process Equipment Specifications

As documented in Section 21 of **Appendix C**, the maximum hourly lubricant application rate for the Tension Leveler (Can Coating Line) (CF-01) has decreased significantly from the as-permitted (11.5 gal/hr) assumption based on traditional lubricator applications to the as-built configuration (0.42 gal/hr) reflecting a change in the lubricant application technology to achieve the desired strip properties with a significantly lower lubricant application rate.

As documented in Section 22 of **Appendix C**, the maximum short-term aluminum throughput and associated annual operating rates for aluminum coil weight and strip area processed for the Alkaline Cleaning Line #1 (Can Coating Line) (CF-02) have decrease slightly (from 22.5 ton/hr in the as-permitted configuration to 19.4 ton/hr in the as-built configuration reflecting a ~14% decrease in aluminum throughput capacity) to reflect the final specifications of the Can Coating Line from the selected equipment vendors.

As documented in Section 23 of **Appendix C**, the maximum hourly aluminum coil processing rate for the Coating Line #1 (CF-03) has been changed to the same basis as the Alkaline Cleaning Line reflecting the continuous process associated with the Can Coating Line where all unit operations carry effectively the same maximum hourly aluminum throughput rate. The maximum hourly heat input capacity of the Coating Line burners (both curing oven individual zone burners and RTO burners) has decreased significantly from 93.2 MMBtu/hr in the as-permitted configuration based on an extremely conservative engineering estimate from preliminary engineering data supplied by initial candidate equipment suppliers to 44.1 MMBtu/hr in the as-built configuration based on the final specifications of the Coating Line's natural gas-fired combustion systems from the selected equipment vendors.

8.1.2 Addition of New Emission Units

As discussed in **Section 2.3.5.4** and further documented in Sections 24 and 25 of **Appendix C**, Novelis plans to install and operate a high speed edge trimming line to support finished coil production that meets customer specifications for coil edge quality and desired widths. The only potential emissions generating activities associated with the edge trimmer are the Electrostatic Oiler (CF-04) as a relatively small source of PM and VOC emissions from electrostatic application of a low vapor pressure strip lubricant and the Scrap Baller (CF-05) as a very small source of PM emissions from the wet scrubber stack associated with the scrap collection system on the Edge Trimmer.

8.2 Control Device Changes

As documented in Section 22.2.1 of **Appendix C**, the filterable PM emissions performance and exhaust flow rate specifications for the Alkaline Cleaning Line Scrubber have been reconciled to the final as-built specifications from the selected equipment vendor. The filterable PM emissions performance expressed on an exit concentration basis for the scrubber has decreased from 10 mg/m^3 in the as-permitted configuration to 5 mg/m^3 in the as-built configuration reflecting the expected PM removal capabilities of the scrubber's demister. The exhaust flow capacity of the capture and collection system associated with the scrubber has increased from 5,240 acfm in the as-permitted configuration to 7,653 acfm in the as-built configuration to reflect the final specifications of the induced draft fan serving the scrubber.

In conjunction with the reduced curing oven heat input rate, changes to the hot air recirculation fans, and other final engineering design updates for the Coating Line, the maximum exhaust flow rate at standard conditions for the Coating Line RTO has decreased from a conservatively high preliminary engineering design basis in the as-permitted configuration of 90,000 Nm^3/hr to the final design specification of 60,000 Nm^3/hr in the as-built configuration. This reduced exhaust flow rate also allows for a lower burner heat input capacity for the RTO (decrease from 7.2 MMBtu/hr in the as-permitted configuration to 6.2 MMBtu/hr in the as-built configuration).

8.3 Air Emissions Changes

8.3.1 Tension Leveler Air Emissions Quantification

As documented in Section 21 and summarized in Table 1-1.3 of **Appendix C**, the significantly reduced lubricant application rate now produces a scenario where the VOC potential emissions estimate from an evaporative loss model from the surface coating industry [specifically, EPA's Emission Inventory Improvement Program (EIIP) Volume 2 Chapter 8 for Paint, Ink, and Other Coating Manufacturing Equation 8.4-22 for emissions from surface evaporation of VOCs and Equation 8.4-21 for the diffusion coefficient] yields a VOC mass emission rate that exceeds the mass of lubricant applied. To resolve this issue, Novelis has now applied a 100% evaporative loss assumption to all lubricant applied at the Tension Leveler by using the lubricant density as the VOC emission factor expressed in lb/gal of lubricant applied. Although the long-term average operating parameters of the Tension Leveler could support a VOC emission factor based on the evaporative loss model, Novelis has conservatively chosen to assume 100% evaporative loss of all Tension Leveler lubricant applied for the purposes of calculating both the hourly and annual potential VOC emissions. Implementing this alternative VOC emission factor basis for the Tension Leveler causes a relatively small increase (~1.6 tpy) in calculated annual potential VOC emissions between the as-permitted and as-built emission calculations. However, this small annual potential VOC emissions increase from the Tension Leveler is more than offset by decreases in annual potential VOC emissions from the Alkaline Cleaning Line and Coating Line such that the Coil Finishing Area has a lower process area-wide annual potential VOC emission rate in the as-built configuration than documented in the original PSD permit action for the as-permitted configuration.

8.3.2 Alkaline Cleaning Line Air Emissions Quantification

As documented in Section 22 and summarized in Table 1-1.3 of **Appendix C**, the maximum residual oil content on coils routed to the inlet of the Alkaline Cleaning Line has significantly decreased (from 510 mg/m^2/side in the as-permitted configuration to 30 mg/m^2/side in the as-built configuration) due to the reduced application rate of lubricant at the upstream Tension Leveler. This change results in a reduction in annual potential VOC emissions between the as-permitted and as-built configuration of approximately 6.7 tpy.

8.3.3 Coating Line Air Emissions Quantification

As documented in Section 23 and summarized in Table 1-1.3 of **Appendix C**, the reduced maximum hourly burner heat input rating for the Coating Line curing oven and RTO burners coupled with the reduced exhaust flow rate of the RTO produce substantive reductions in the annual potential emissions of multiple regulated NSR pollutants (~6.2 tpy of PM, ~14.5 tpy of NO_X, ~29.0 tpy of CO, and ~7.0 tpy of VOC). The RTO emissions performance specifications for PM, VOC, NO_X, and CO remain unchanged as the values used in the as-permitted configuration continue to be representative of the final engineering design of the as-built configuration of the Coating Line process equipment and control device. However, the maximum VOC inlet

loading to the RTO from coating usage has been updated (from 1,557 lb/hr in the as-permitted configuration to 1,184 lb/hr in the as-built configuration) which affects the nominal RTO VOC control efficiency assigned to the as-built configuration of the RTO (minimal change from 99.75% in the as-permitted configuration to 99.78% in the as-built configuration).

8.3.4 Edge Trimmer Air Emissions Quantification

8.3.4.1 Edge Trimmer Electrostatic Oiler Emissions Quantification

As documented in Section 24.2.1 of **Appendix C**, the VOC potential emission calculations for the Electrostatic Oiler are based on the maximum application rate, density, and VOC content of the lubricant and an engineering estimate for the amount of evaporative loss of the lubricant based on the intended application of achieving maximum coil product adhesion and to reflect the low volatility of the lubricants planned for use. The VOC content of the lubricant and estimated evaporative loss to the air phase are consistent with the VOC BACT limit basis for a similar coil finishing operation at the Aluminum Dynamics, LLC (ADL) rolling mill in Columbus, MS. The Electrostatic Oiler's VOC potential emissions are fully offset by decreases from the Alkaline Cleaning Line and Coating Line such that the installation of this new source does not cause a process area-wide annual potential VOC emissions increase for the Coil Finishing area.

As documented in Section 24.2.2 of **Appendix C**, the filterable PM/PM_{10}/$PM_{2.5}$ annual potential emission calculations for the Electrostatic Oiler are based on the vendor supplied estimate for the transfer efficiency of the electrostatic applicator (98%) and an engineering estimate for the enclosure/building removal efficiency (90%) where the unit's enclosure and surrounding Coil Finishing building are expected to prevent the vast majority of any lubricant sprays that do not end up on the aluminum strip from escaping from building vents and other openings as fugitive PM emissions. This same 90% building removal efficiency was used in the as-permitted annual potential PM emission calculation basis for the Ingot Saws, HRM, HFM, and TCM, so ADEM has already confirmed the technical basis of this engineering estimate such that it can be readily applied to the Electrostatic Oiler's potential PM emission calculations. The Electrostatic Oiler installation results in a small increase in annual potential PM/PM_{10}/$PM_{2.5}$ emissions (~2.5 tpy), but similar to the situation with VOC emissions from this source, the VOC emissions reductions of other Coil Finishing process area sources more than offsets the small increase such that the as-built configuration of the Coil Finishing area has lower annual potential PM/PM_{10}/$PM_{2.5}$ emissions than the as-permitting configuration.

8.3.4.2 Edge Trimmer Scrap Baller Emissions Quantification

As documented in Section 25.2 of **Appendix C**, the Scrap Baller is a potential source of controlled filterable PM emissions from the scrubber stack. The venturi-type, water-based wet scrubber planned to be installed to serve the Scrap Baller whose primary purpose is related to mitigating the risk for accumulation of combustible dust which may result in an explosion/fire, but has the added benefit of also reducing potential airborne PM emissions. Potential PM emissions from the scrubber are estimated based on the vendor-supplied PM emissions performance expressed on an exit concentration basis and the exhaust flow capacity for the scrubber consistent with the emission calculation methodology applied to the Alkaline Cleaning Line. The Scrap Baller annual potential PM/PM_{10}/$PM_{2.5}$ emissions increase (~1.2 tpy) is fully offset by the reduction in PM/PM_{10}/$PM_{2.5}$ emissions from the other as-built changes in the Coil Finishing process area.

8.4 Applicable Requirements Summary for New Emission Units

The new Edge Trimmer proposed for installation at the Bay Minette facility will be subject to, or potentially subject to, certain federal or state air quality regulations. This section of the permit application summarizes

the air permitting requirements and the key air quality regulations that apply to this new emission unit within the Coil Finishing area under both federal and state permitting programs. Applicability to NSPS, NESHAP, and ADEM Admin. Code R., and other potentially applicable regulations are addressed.

8.4.1 NSPS Applicability Analysis

NSPS codified under 40 CFR Part 60 require new, modified, or reconstructed sources in applicable source categories to control emissions to the levels achievable by the best demonstrated technology as specified in the applicable provisions. ADEM Admin. Code R. 335-3-10 incorporates Federal Regulations of 40 CFR Part 60 by reference. The following is a summary of the non-applicability determination for NSPS Subpart TT for the Electrostatic Oiler on the Edge Trimmer line. Novelis requests a permit shield as to the non-applicable standards in NSPS Subpart TT for the Electrostatic Oiler because this source is not part of the metal coil surface coating-affected source category in NSPS Subpart TT.

8.4.1.1 NSPS Subpart TT – Metal Coil Surface Coating

NSPS Subpart TT applies to metal coil surface coating operations for which construction, modification, or reconstruction commenced after January 5, 1981. Affected facilities subject to the provisions of this subpart are each prime coat operation, each finish coat operation, and each prime and finish coat operation combined when the finish coat is applied wet over the prime coat and both coatings are cured simultaneously. As defined under 40 CFR 60.461(a), prime coat and finish coat operations include the coating application station, curing oven, and quench station used to apply and dry or cure the initial and final coating(s), respectively, on the surface of a metal coil. Where only a single coating is applied, that single coating is considered the finish coat. The universe of coatings intended to be covered by the metal coil surface coating surface category was clarified through promulgation of the NESHAP for the Surface Coating of Metal Coil (40 CFR 63, Subpart SSSS). Specifically, 40 CFR 63.5110 states that:

> *Decorative, protective, or functional materials that consist only of solvents, protective oils, acids, bases, or any combination of these substances are not considered coatings…*

The various lubricants planned to be applied to the surface of the aluminum metal strip processed in the Electrostatic Oiler would be protective lubricants if the newer NESHAP Subpart SSSS coating definition is more broadly applied to qualify the older, more limited coating definition within NSPS Subpart TT. Novelis understands that the NSPS and NESHAP regulations are separate and independent regulations and definitions included within these regulations are typically very specific to each of these largely independent federal air regulatory programs. However, in this case, using definitions from both these similar federal air regulations is just a matter of practicality as the NSPS Subpart TT regulation was promulgated in 1982 whereas the NESHAP Subpart SSSS regulation was promulgated 20 years later in 2002. Therefore, the EPA and authors of the NESHAP Subpart SSSS regulation were a bit more refined and prescriptive in their included definitions as compared to the much older Subpart TT regulation.

The more recent federal NESHAP Subpart SSSS coating definition for excluding protective oils from the definition of regulated coatings is also consistent with the "Coatings Used in Coil Coating" provided in Table 3-1 of the *Metal Surface Coating Industry- Background Information for Proposed Standards* EPA background document associated with the initial NSPS Subpart TT emissions standards.[13] Specifically, the list of coatings commonly used by the metal coil surface coating industry at the time of promulgation of the NSPS Subpart

[13] EPA Office of Air Quality Planning and Standards, Emission Standards and Engineering Division, Metal Coil Surface Coating Industry – Background Information for Proposed Standards, October 1980, EPA-450/3-80-035a, available at nepis.epa.gov/Exe/ZyPDF.cgi/9101M6GN.PDF?Dockey=9101M6GN.PDF

TT emissions standards did not include the types of protective lubricants/oils used in the Electrostatic Oilers, and instead the list of coatings in the NSPS Subpart TT background document only addresses the classes of more common solvent-based and water-based coatings used to achieve desired protective, decorative, or functional properties. In addition, Novelis is aware of at least one other Electrostatic Oiler in EPA Region 4's jurisdiction which is designated as not being subject to NSPS Subpart TT requirements because "the lubricants applied can be considered protective oils as no solid film is formed on the surface of the strip."[14]

Based on these federal air regulatory considerations for the metal coil surface coating source category, the Electrostatic Oiler is considered to be exempt from the requirements of NSPS Subpart TT due to the applied lubricants not meeting the intended definition of a coating.

8.4.2 NESHAP Applicability Analysis

NESHAP, located in 40 CFR 61 and 40 CFR 63, have been promulgated for source categories that emit HAP to the atmosphere. ADEM Admin. Code R. 335-3-11 incorporates Federal Regulations of 40 CFR Parts 61 and 63 by reference. A facility that is a major source of HAP is defined as having potential emissions of greater than 25 tpy of total HAP and/or 10 tpy of individual HAP. Facilities with a potential to emit HAP at an amount less than that which is defined as a major source are otherwise considered an area source. The NESHAP allowable emissions limits are most often established on the basis of a maximum achievable control technology (MACT) determination for the particular major source. The NESHAP rules apply to sources in specifically regulated industrial source categories (Clean Air Act Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type.

The proposed Bay Minette project site will be classified as a major source of HAP emissions. The determination of non-applicability to NESHAP Subpart SSSS requirements for the Electrostatic Oiler is detailed in the following section. Novelis requests a permit shield as to the non-applicable standards in NESHAP Subpart SSSS for the Electrostatic Oiler because this source is not part of the surface coating of metal affected source category in NESHAP Subpart SSSS.

8.4.2.1 NESHAP Subpart SSSS – Surface Coating of Metal

NESHAP Subpart SSSS applies to each facility that is a major source of HAP, as defined in 40 CFR 63.2, at which a coil coating line is operated. As defined under 40 CFR 63.5110, a coil coating line is the collection of equipment used to apply organic coatings to the surface of a metal coil. A metal coil is defined as a continuous metal strip that is at least 0.15 millimeter (0.006 inch) thick packaged in a roll or coil prior to coating. A coil coating line includes a "web unwind or feed section, a series of one or more workstations, any associated curing oven, wet section, and quench station. A coil coating line does not include ancillary operations such as mixing, cleaning, wastewater treatment, and storage of coating material."[15] A workstation means "a unit on a coil coating line where coating material is deposited onto the metal coil substrate."[16] Under Subpart SSSS, a coating is a material applied onto or impregnated into a substrate for decorative, protective, or functional purposes. Emissions and operational limitations provided in the NESHAPs are established based on a MACT determination for a particular major source category.

---

[14] Kentucky Division for Air Quality (KDAQ), Statement of Basis/Summary for Title V, Construction/Operating PERMIT ID: V-20-032 R3 Commonwealth Rolled Products, Inc., 8/6/24, available at https://dep.gateway.ky.gov/eSearch/agencydetails?agencyid=1622

[15] 40 CFR 63.5110 definition of "Coil coating line"

[16] 40 CFR 63.5110 definition of "Work station"

Pursuant to 40 CFR 63.5110, regulated coatings do not include decorative, protective, or functional materials that consist only of solvents, protective oils, acids, bases, or any combination of these substances. Protective oil is defined as an organic material applied to metal for the purpose of providing lubrication or protection from corrosion without forming a solid film. This includes, but is not limited to, lubricating oils, evaporative oils (including those that evaporate completely), and extrusion oils. The various lubricants applied to the surface of the aluminum metal strip processed in the Electrostatic Oiler will be classified as protective lubricants. Therefore, each of the Electrostatic Oiler is exempt from the requirements of NESHAP Subpart SSSS.

8.4.3 Alabama SIP Regulation Applicability Analysis

In addition to federal air regulations, the ADEM Admin. Code R. 335-3, updated October 13, 2025, establishes regulations applicable for the proposed Bay Minette project site. ADEM rules potentially applicable to the Edge Trimmer are detailed in the following sections.

8.4.3.1 ADEM Admin. Code R. 335-3-4-.01 – Visible Emissions

ADEM Admin. Code R. 335-3-4-.01 restricts visible emissions from any source of particulate emissions to 20 percent with not more than one 6-minute period of up to 40 percent opacity per 60-minute period. This regulation also details monitoring requirements and work practice standards. The Scrap Baller scrubber stack will be subject to this rule.

8.4.3.2 ADEM Admin. Code R. 335-3-4-.04 – PM from Process Industries

This regulation limits particulate emissions from manufacturing processes in Class I and Class II Counties. The proposed Bay Minette project site is in Baldwin County which is classified as a Class II County.[17] However, pursuant to ADEM Admin. Code R. 335-3-4-.04(5), new sources shall be subject to the same requirements for facilities located in Class I counties. As such, the maximum allowable PM emissions for the Scrap Baller scrubber is determined using the following equations:

$$E = 3.59\ P^{0.62}, \quad P < 30 \text{ tons/hr}$$
$$E = 17.31\ P^{0.16}, \quad P \geq 30 \text{ tons/hr}$$

where:

E = allowable particulate emissions [lb/hr]
P = process weight rate [tons/hr]

Novelis will comply with this rule by proper operation of the Scrap Baller. In addition, the Scrap Baller is subject to PM BACT review and limits which will ensure compliance with this rule.

8.5 Suggested PSD Permit Changes

The following sections summarize the key PSD permit changes needed to reflect the as-built changes to process equipment and control device engineering design and operating specifications and corresponding potential emissions changes.

[17] ADEM Admin. Code R. 335-3 Appendix A

8.5.1 Tension Leveler (X018) PSD Permit Changes

- If ADEM continues to deem a numerical VOC emissions-based BACT limit for the Tension Leveler to be necessary in the as-built configuration, update the Tension Leveler VOC BACT limit added by ADEM in lieu of Novelis' proposed work practice standard alternatives to reflect the as-built potential emission calculations changes documented in Section 21 of **Appendix C**.
- Update the Tension Leveler annual VOC BACT limit compliance demonstration methodology in Compliance and Performance Test Methods and Procedures proviso No. 14 to replace the VOC emission factor associated with the evaporative loss model to the 100% evaporative loss simplified mass balance approach.
- Revise Recordkeeping and Reporting Requirements proviso No. 7 for Tension Leveler lubricant property records to only reference lubricant density because the molecular weight and vapor pressure are no longer used in the VOC potential emission calculations.

8.5.2 Alkaline Cleaning Line (X018) PSD Permit Changes

- Update the Alkaline Cleaning Line Scrubber (SC1) filterable PM/PM_{10}/$PM_{2.5}$ BACT and VOC to reflect the as-built potential emission calculations changes as summarized in **Appendix A**.

8.5.3 Coating Line (X018) PSD Permit Changes

- Update Coating Line RTO BACT limits for PM, total PM_{10}, total $PM_{2.5}$, NO_X, CO, and VOC expressed in units of lb/hr proposed by Novelis and summarized in **Appendix A** and the corresponding natural gas heat input rate normalized NO_X emission limit added by ADEM with reference to Section 23 of **Appendix C**.
- Update the Coating Line RTO annual GHG BACT limit expressed in units of tons per year on 12-month rolling total proposed by Novelis and summarized in **Appendix A.**

8.5.4 Edge Trimmer (X018) PSD Permit Addition

- Add Electrostatic Oiler to non-applicability statements for NSPS Subpart TT at Applicability proviso No. 4 and NESHAP Subpart SSSS at Applicability proviso No. 6.
- Add reference to Scrap Baller for applicability of filterable PM emissions standards in ADEM Rule 335-3-4-.04(1) at Emissions Standards proviso No. 2.
- Add visible emissions check/opacity requirements at Emission Monitoring proviso No. 1 for the Scrap Baller scrubber stack.
- Add the Scrap Baller scrubber to the Emission Monitoring proviso Nos. 3 and 4 for daily pressure drop readings and continuous monitoring of scrubbing liquid flow rate (or makeup scrubbing liquid addition amounts if added only intermittently).
- Add tracking of Electrostatic Oiler lubricant usage to Recordkeeping and Reporting Requirements proviso No. 6.

8.6 BACT Determination

Most proposed BACT limit changes are a function of as-built updates to process equipment and control device specifications and not an underlying change to the emission calculation methodology or reference emission factors applied. In these instances where a BACT limit is only being updated to reflect minor as-built design specification changes, the prior top-down BACT analysis presented in the original PSD permit

application is still applicable and does not require an updated BACT determination. Conversely, in instances where an as-built potential emission calculation change has resulted in a substantive regulated NSR pollutant emission factor increase not related to process rate and control device flow capacity changes, reconsideration of the original BACT determination is warranted. The following sections address each instance where a Coil Finishing area emission unit is showing an as-built emission factor increase for a regulated NSR pollutant that is not directly related to a process rate or control device flow capacity change and that results in a proposed increase in a corresponding BACT limit as summarized in **Appendix A**. BACT reviews for new emissions units in the Coil Finishing Area are also addressed.

8.6.1 Tension Leveler VOC BACT Evaluation Updates

The annual potential VOC BACT limit proposed for the Tension Leveler is only changing because Novelis is seeking a simplified and more conservative emission calculation methodology to reflect the significant reduction in lubricant application rate for the as-built configuration of the equipment. This small change in the annual potential VOC emission rate assigned to the Tension Leveler does not implicate any of the available control options, technical feasibility statements, and/or economic, environmental, and energy impact evaluation conclusions from the VOC BACT analysis presented in the original PSD application. Therefore, Novelis continues to proposed a Tension Leveler lubricant usage restriction (as-built change to 3,664 gal/yr) as a work practice standard alternative to a numerical VOC emission limit that will maintain VOC emissions at the level consistent with the hourly and annual potential emission calculations for the Tension Leveler presented in Section 21 of **Appendix C**. The Tension Leveler will not be equipped with a capture and collection system in the as-built configuration, so directly measuring the VOC emissions is not technically feasible. When direct measurements of pollutant emissions are not technically feasible, work practice standard alternatives to numerical emissions-based BACT limits are commonly applied. Based on review of the RBLC database and available permit files for potentially similar facilities, Novelis believes that the proposed VOC BACT limits and work practice standards are comparable to the most stringent control determinations in the RBLC for similar operations.

8.6.2 Coating Line NO_X BACT Evaluation Updates

Although the Coating Line hourly and annual potential emissions for all regulated NSR pollutants are decreasing as a result of the as-built changes to the curing oven and RTO burner heat capacity and exhaust flow capacity for the RTO, the originally proposed NO_X BACT limit expressed in units of lb NO_X/MMscf and presented in **Section 7.6.4** of the original PSD application does increase in the as-built configuration (from 106.5 lb NO_X/MMscf in the as-permitted configuration to 150.1 lb NO_X/MMscf in the as-built configuration). The natural gas usage rate normalized NO_X emissions performance of the Coating Line in its as-built configuration still falls within the low NO_X emissions performance range for the types of direct-fired burners used in the curing oven and RTO where high turndown requirements are needed and some of the low NO_X features applied with conventional burner systems in industrial boilers and process heaters are not available for this type application/use of the burners to achieve the underlying intended process specifications.

Specifically, the Coating Line NO_X emissions performance for the Bay Minette facility falls well below the equivalent lb NO_X/MMscf NO_X BACT limit basis for the ADL Columbus facility (refer to Condition 3.33 in PSD Air Construction Permit No. 1680-00086) and a recent NO_X performance test for Logan Aluminum's Coating Line equipped with a new RTO installed in 2012 (refer to Title V permit V-20-004 R4 Statement of Basis/Summary). Finally, none of the similar source BACT determinations presented in Table F-14 of **Appendix F** to the original PSD application for aluminum coil coating lines included NO_X BACT limits that can be used to evaluate the NO_X emissions performance of Novelis' proposed NO_X BACT limit basis for the Coating Line at the Bay Minette facility in the as-built configuration. Therefore, Novelis continues to consider

the proposed NO_X BACT limits for the Coating Line to be the most stringent limits established for any recently permitted aluminum coil coating lines currently in operation.

8.6.3 Edge Trimmer Electrostatic Oiler BACT Evaluation

8.6.3.1 PM/PM_{10}/$PM_{2.5}$ BACT Evaluation

8.6.3.1.1 Available PM/ PM_{10}/$PM_{2.5}$ Control Technologies for Edge Trimmer Electrostatic Oiler

PM emissions from the Electrostatic Oiler are generated by the electrostatic application of lubricant with the potential to release a very small quantity of lubricant particles/droplets into the Coil Finishing building environment and possible release as fugitive emissions from building vents and other openings. The lubricant application function of the Electrostatic Oiler is achieved by electrostatically charging the lubricant particles/droplets leaving the spray bar in a manner that makes these particles attracted to and adhere to surrounding metal surfaces. The fundamental design basis is for any applied lubricant which does not reach the metal strip or the Electrostatic Oiler's sump will hit the metal walls of the Electrostatic Oiler physical housing in which the aluminum strip travels. Any lubricant "overspray" is designed to be entrained fully within the equipment housing and lubricant collection system. As the lubricant particles/droplets contact the metal surfaces of the Electrostatic Oiler housing, the lubricant particles/droplets lose their charge, and then flow to the equipment sump afterwards. This basic functional design and lubricant collection process will capture the vast majority of any over-applied lubricant through the Electrostatic Oiler due to the very high transfer efficiency (98%) achieved by the electrostatic lubricant application method and subsequent removal efficiency (90%) of the metal surfaces within the enclosure/housing.

However, a very small amount of still charged lubricant particles/droplets have the potential to exit the Electrostatic Oiler housing by entrainment in the air currents induced by the rapid movement of the strip passing through the Electrostatic Oiler housing [up to 1,850 m/min (69 miles/hr) as documented in Section 24.1.1 of **Appendix C** to the as-built application]. These "uncaptured" lubricant particles/droplets which exit the Electrostatic Oiler housing still have the potential to adhere to the running strip itself or to adhere to other metal surfaces in the immediate vicinity (other nearby Coil Finishing area equipment and building), depending on which metal surface these charged lubricant particles/droplets happen to impact first. As the particles/droplets would be relatively denser than the ambient building air, the uncaptured PM emissions represented by the lubricant particles/droplets would not reasonably be expected to be lofted in the tall building bays and actually escape from the building openings (e.g., HVAC roof vents).

The charged lubricant particles/droplets which could leave the Electrostatic Oiler housing borne by the rapidly moving air stream at the strip interface cannot be reasonably collected by any exhaust fan acting as a PM emissions collection system for the Electrostatic Oiler's housing. These lubricant particles/droplets are simply moving too fast to be captured by the typical/conventional PM emissions collection processes. The vast majority of the other charged lubricant particles/droplets released inside the Electrostatic Oiler's housing that are not transferred directly to the strip at the high transfer efficiency (98%) remain within the area of the housing and are neutralized by the metal walls of the housing itself.

The very small amount of still electrostatically charged lubricant particles/droplets which could theoretically be drawn into an exhaust fan-driven fume collection system would subsequently adhere to the downstream metal ducting, fan components, and any metal frames and other parts that would be included within any candidate PM control options. These specialized design and operational features of the Electrostatic Oiler warrant specific consideration when evaluating the availability and technical feasibility of the commonly applied add-on PM control options for other similar/transferable source types.

There are no NSPS or NESHAPs that can be used to establish a floor for PM emission rates from electrostatic lubricant application processes associated with aluminum coil finishing operations.

Based on a review of technical literature, past control technology determinations for potentially similar sources, and vendor knowledge, generally available technologies and practices which could be potentially applied to control PM emissions from the Electrostatic Oiler are listed below (similar list as presented for the Alkaline Cleaning Line in **Section 6.1.9** of the original PSD application and refer to **Section 6.1** introduction from the original PSD application for additional technical descriptions of each available $PM/PM_{10}/PM_{2.5}$ control option):

- Baghouse
- Electrostatic Precipitator (ESP)
- Wet Scrubber
- Mist Eliminator
- Good Design and Operating Practices

8.6.3.1.2 Technically Feasible $PM/PM_{10}/PM_{2.5}$ Control Technologies for Edge Trimmer Electrostatic Oiler

The technical feasibility of each of the $PM/PM_{10}/PM_{2.5}$ control technologies for Electrostatic Oiler is described below. As mentioned in the summary of available $PM/PM_{10}/PM_{2.5}$ control options, the Electrostatic Oiler has the potential to produce PM emissions due to the air currents induced by the rapid movement of the strip passing through the Electrostatic Oiler housing. These "uncaptured" lubricant particles/droplets will be electrostatically charged due to the nature of the application and will have the potential to adhere to the running strip itself or to other metal surfaces in the immediately adjacent Coil Finishing area. Electrostatic Oiler equipment suppliers have historically attempted to design and implement add-on exhaust fume collection and PM emissions control devices to remove and control any overspray of charged lubricant particles/droplet in early versions of this metal strip lubricant application technology. However, these add-on PM control device implementation efforts proved to be unsuccessful and add-on fume collection designs have been removed from all subsequent Electrostatic Oiler installations. This evolution of Electrostatic Oiler technology for metal strip lubricant application and related technical considerations collectively supports a determination that all candidate add-on PM control options can be eliminated from the PM BACT determination on the basis of technical infeasibility as further described in the following sections.

Fabric Filter (Baghouse) for Electrostatic Oiler

The Electrostatic Oiler will produce wet and charged particles which will adhere to any available metal surfaces in the baghouse duct work and baghouse compartments. Commercially available baghouses are manufactured using metal parts. The charged nature of the PM emissions generated by the Electrostatic Oiler would adhere to the walls of the ducting and bag compartments rather than be passed onto the fabric filters. As more droplets adhere to the walls, the coalescing of droplets will cause liquid to pool in the ductwork of the baghouse. Even if the particles manage to reach the fabric filters without adhering to a metal surface, the charged nature of the droplets would cause a conglomeration of wet, charged droplets which would clog the fabric filter and can lead to increased energy costs, shortened filter life, system underperformance, and unplanned operation disruptions. Baghouses are intended for collection of dry particulate matter. Furthermore, the RBLC search results did not identify any instances of a baghouse being used to control PM emissions from similar sources. Therefore, this technology is considered to be technically infeasible for the Electrostatic Oiler at the Bay Minette facility, and it is not addressed in the remaining steps of the BACT evaluation.

Electrostatic Precipitator for Electrostatic Oiler

As was the case with the fabric filter, dry ESPs are not feasible due to the specific characteristics of the applied lubricants and the associated charged nature of the lubricant particles that would be present as PM emissions in the exhaust stream from an Electrostatic Oiler equipped with a capture and collection system. Wet ESPs (Wire-Pipe Type) are typically designed to control gas flow rates in the range of 1,000 - 100,000 scfm.[18] Gas flows from the Electrostatic Oiler may fall below low end of this range based on the relatively small size and low open area of the electrostatic oiler enclosure. Also, the Electrostatic Oiler will not operate constantly at a stable set of operating parameters, resulting in variable particulate flow to the ESP. Additionally, the metal construction of all commercially available ESPs would cause the charged droplets to adhere to the walls of the ducting and coalesce together and pool in the ductwork of the ESP. Furthermore, the RBLC search did not identify any instances of a wet ESP being used on a similar source. Therefore, this technology is not considered to be technically feasible for the Electrostatic Oiler at the Bay Minette facility, and it is not addressed in the remaining steps of the BACT evaluation.

Wet Scrubbers for Electrostatic Oiler

Emissions from the Electrostatic Oiler process are uncaptured and are released into the Coil Finishing building. Even if a hooding system was to be installed, the charged lubricant particles/droplets used in the Electrostatic Oiler causes particles to agglomerate/coalesce on the metal surfaces in the wet scrubber duct work making any capture and collection system for an add-on control device not recommended or technically feasible. Many similar processes for aluminum strip "pre-lube" treatment have been installed in the United States, and all of these similar units emit uncaptured emissions. Therefore, wet scrubbers are eliminated from further consideration in the Electrostatic Oiler BACT analysis on the basis of technical infeasibility.

Mist Eliminators for Electrostatic Oiler

No mist eliminators were identified in the RBLC review for Electrostatic Oilers or other similar lubricant application processes. As mentioned in the wet scrubber control technology analysis, an exhaust system is not feasible for the proposed design as the charged lubricant particles will adhere to metal surfaces and have the potential to block the exhaust system ductwork. Even if a non-metal or static charge neutral hooding system was feasible using novel techniques for addressing ductwork blockages from the conglomeration of charged particles/droplets, PM emissions from the Electrostatic Oiler are very low due to the high lubricant application transfer efficiency, making additional PM controls via a mist eliminator ineffective at removing the very small amount of residual PM emissions which could possibly be present in any capture and collection system for the Electrostatic Oiler. Therefore, mist eliminators are eliminated from further consideration in the Electrostatic Oiler BACT analysis on the basis of technical infeasibility.

Good Operating and Maintenance Practices for Electrostatic Oiler

Good operating and maintenance practices that fully consider the charged nature of the particles/droplets represent a technically feasible control option for minimizing PM emissions from the Electrostatic Oiler. Specific practices targeting PM emissions minimization, similar to those employed to minimize VOC emissions, include:

- Controlling lubrication application rates to ensure process conditions are maintained at optimum levels;
- Spill prevention and other waste reduction measures; and
- Adhering to written operating instructions and procedures.

[18] EPA, *Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) – Wire-Pipe Type.* EPA-452/F-03-030.

No good operating and maintenance practices were identified in the RBLC review for Electrostatic Oilers similar to Novelis' operation; however, Novelis has chosen to consider good operating and maintenance practices, including lubricant usage limitations combined with associated monitoring, to be feasible PM control technologies warranting further consideration in the BACT Evaluation.

8.6.3.1.3 Effectiveness Ranking of $PM/PM_{10}/PM_{2.5}$ Control Technologies for Edge Trimmer Electrostatic Oiler

The only remaining control technology for the Electrostatic Oiler is good operating and maintenance practices which has been selected in the $PM/PM_{10}/PM_{2.5}$ BACT determination and does not require any specific ranking by effectiveness.

8.6.3.1.4 Economic, Environmental, and Energy Impacts of $PM/PM_{10}/PM_{2.5}$ Control Technologies for Edge Trimmer Electrostatic Oiler

The only remaining control technology from Step 3 will be used for the Electrostatic Oiler. Therefore, an economic analysis is not necessary to select the BACT control technology, and no discussions of environmental or energy impacts are warranted.

8.6.3.1.5 BACT Selection for $PM/PM_{10}/PM_{2.5}$ for Edge Trimmer Electrostatic Oiler

The Electrostatic Oiler is not equipped with a capture and collection system routed to a duct, stack, or vent where direct measurement of $PM/PM_{10}/PM_{2.5}$ emissions is considered technically feasible. Therefore, Novelis is proposed to implement good operating and maintenance practices as a work practice standard to a numerical emission-based BACT limit combined with a proposed annual operating limitation on lubricant usage which will ensure that the annual potential $PM/PM_{10}/PM_{2.5}$ emissions presented in Section 24 of **Appendix C** are not exceeded in practice. Specifically, as documented in Table A-6 in **Appendix A**, Novelis is proposing an annual lubricant usage operating limit for the Electrostatic Oiler of 341,092 gal/yr on a 12-month rolling basis, where the proposed annual lubricant usage limit is directly derived from the maximum lubricant application rate, maximum strip area processed, and lubricant density presented in potential emission calculations for the Electrostatic Oiler (refer to Section 24 of **Appendix C**).

8.6.3.2 VOC BACT Evaluation

8.6.3.2.1 Available VOC Control Technologies for Edge Trimmer Electrostatic Oiler

VOC emissions from the Electrostatic Oiler are generated from evaporative loss of the VOC fraction of the applied lubricants into the Coil Finishing building which have the potential to be released from the building vents and openings as fugitive VOC emissions. There are no NSPS or NESHAP standards applicable to VOC emissions from this category of unit operations, which would serve as a baseline for this BACT determination. The following generally available technologies discussed in **Section 9.1** of the original PSD application could potentially be applied to control VOC emissions from the Electrostatic Oiler.

- Thermal and Catalytic Oxidation
- Condensation Systems
- Adsorption Systems
- Absorption Systems

Accordingly, each of these general add-on VOC control technologies is discussed in the following sections. Along with these add-on VOC control options, Novelis has also considered the potential availability of the following lower emitting alternatives and operational considerations:

Alternative Material Formulations for Electrostatic Oiler

Alternative material formulations are an available control technology in which lower-emitting materials are used as a replacement for higher-emitting materials. No alternative material formulations were identified in the RBLC review for aluminum strip lubricant application operations similar to the Novelis Bay Minette Electrostatic Oiler. Novelis' selection of lubricants in the Electrostatic Oiler is intended to meet the specifications of downstream customers with no ability to change these lubricant materials for VOC emissions mitigation purposes without compromising the ability to meeting customer requirements. Therefore, alternative material formulations are not considered to be an available control option for the Electrostatic Oiler.

Good Operating and Maintenance Practices for Electrostatic Oiler

Good operating and maintenance practices are an available control technology in which certain key operating and maintenance practices can be implemented to prevent excessive evaporative losses. The specific practices targeting VOC emissions minimization are the same as those described above for PM emissions minimization.

8.6.3.2.2 Technically Feasible VOC Control Technologies for Edge Trimmer Electrostatic Oiler

The technical feasibility of each of the VOC control technologies for the Electrostatic Oiler is described below.

Thermal and Catalytic Oxidation Systems for Electrostatic Oiler

Thermal oxidation-based control systems are most effective for concentrated VOC streams that have sufficient heating values to sustain the high oxidation temperature necessary for complete combustion to occur. However, the Electrostatic Oiler does not generate concentrated VOC streams with high heating values. Consequently, in order for the exhaust of this non-combustion Electrostatic Oiler to reach thermal oxidizer operating temperatures (as well as the necessary heat content for combustion to occur), it would be necessary to combust substantial quantities of supplemental fuel, which would have severe energy, environmental, economic, and process drawbacks. Additionally, lubricant is applied in varying amounts and frequencies throughout the operating timeframe for the Electrostatic Oiler, but thermal oxidation-based control system would have to be run continuously in order to avoid the lengthy and energy intensive process of periodic startup and shutdown activities associated with the batch nature of the underlying process. Furthermore, the RBLC search did not identify any instances of a thermal oxidation system being used on a similar source. Therefore, this technology is not considered to be technically feasible for the Electrostatic Oiler, and it is not addressed in the remaining steps of the BACT evaluation.

Catalytic oxidizers are also most effective for controlling concentrated VOC streams; however, catalytic oxidizers have been used to control VOC emissions down to 1 ppm, and could therefore be used to treat the exhaust of Novelis' Electrostatic Oiler. Although the low VOC concentration may not be problematic, the catalytic oxidizers also require sufficient supplemental fuel in order to reach efficient operation similar to thermal oxidizers. It would be necessary to combust substantial quantities of supplemental fuel, which would have severe energy, environmental, economic, and process drawbacks. Furthermore, the RBLC search did not identify any instances of a catalytic oxidation system being used on a similar source. Therefore, this technology is not considered to be technically feasible for the Electrostatic Oiler, and it is not addressed in the remaining steps of the BACT evaluation.

Condensation Systems

The VOC species derived from the Electrostatic Oiler are not the type of VOC typically controlled by condensation systems. The exhaust stream entering the condenser from the Electrostatic Oiler would contain low vapor pressure, high boiling point hydrocarbon vapors and liquid droplets. Condensers are only effective VOC control devices in applications involving high VOC concentration emissions streams that are at or near complete saturation of the VOC in the exhaust air. Any Electrostatic Oiler exhaust stream that could feasibly be captured and collected would contain a dilute VOC concentration such that the control effectiveness of a condenser would be much lower, if any control is offered at all, than more concentrated exhaust streams. Based on the relatively low VOC concentrations and VOC properties of the oils being applied, Novelis has determined that a condensation system is not likely to be a technically feasible approach for the control of VOC emissions from the Electrostatic Oiler. Additionally, the RBLC search results did not identify any instances of a condensation system being used to control VOC emissions from a similar source. Therefore, this technology is not considered to be technically feasible for the Electrostatic Oiler, and it is not addressed in the remaining steps of the BACT evaluation.

Adsorption Systems

Carbon adsorption is not suitable for high boiling point or high molecular weight organics which are difficult to remove from carbon under normal regeneration temperatures. The continuing buildup of these compounds on the carbon greatly decreases the operating capacity and results in frequent replacement of the carbon. The VOC being controlled from the Electrostatic Oiler consists of hydrocarbons with high boiling points and high molecular weights which would make regeneration of the adsorption bed infeasible by conventional means. Based on the VOC properties, Novelis has determined that a carbon adsorption system is not likely to be technically feasible for the control of VOC emissions from the Electrostatic Oiler. No adsorption systems were identified in the RBLC review as BACT for similar aluminum strip lubricant application processes. Therefore, this technology is not considered to be technically feasible for the Electrostatic Oiler, and it is not addressed in the remaining steps of the BACT evaluation.

Absorption Systems

Absorption control systems, such as heavy oil scrubbers, can be designed to control and recover VOC emissions from concentrated exhaust streams, especially water-soluble compounds. The use of scrubbers can be challenging if the VOC to be controlled has limited solubility in the scrubbing liquid. However, use of a scrubber is not considered to be technically feasible for the Electrostatic Oiler due to the low concentration of VOC in the exhaust stream and incompatibility of the long-chain hydrocarbon vapors comprising the VOC emissions with conventional scrubbing liquids.

Good Operating and Maintenance Practices

The good operating and maintenance practices discussed previously in the Step 1 control option availability review represent a technically feasible control option for minimizing VOC emissions from the Electrostatic Oiler.

8.6.3.2.3 Effectiveness Ranking of VOC Control Technologies for Edge Trimmer Electrostatic Oiler

The only remaining control technology for the Electrostatic Oiler is good operating and maintenance practices which has been selected in the VOC BACT determination and does not require any specific ranking by effectiveness.

8.6.3.2.4 Economic, Environmental, and Energy Impacts of VOC Control Technologies for Edge Trimmer Electrostatic Oiler

The only remaining control technology from Step 3 will be used for the Electrostatic Oiler. Therefore, an economic analysis is not necessary to select the BACT control technology, and no discussions of environmental or energy impacts are warranted.

8.6.3.2.5 BACT Selection for VOC for Edge Trimmer Electrostatic Oiler

The Electrostatic Oiler is not equipped with a capture and collection system routed to a duct, stack, or vent where direct measurement of VOC emissions is considered technically feasible. Novelis is proposing to implement good operating and maintenance practices as a work practice standard to a numerical emission-based VOC BACT limit combined with a proposed annual operating limitation on lubricant usage (refer to Table A-6 in **Appendix A**) which will ensure that the annual potential VOC emissions presented in Section 24 of **Appendix C** are not exceeded in practice.

8.6.4 Edge Trimmer Scrap Baller PM/PM_{10}/$PM_{2.5}$ BACT Evaluation

8.6.4.1 Available PM/ PM_{10}/$PM_{2.5}$ Control Technologies for Edge Trimmer Scrap Baller

The only regulated air pollutant expected to be emitted by the Scrap Baller is PM emissions generated from the edge trim-based scrap handling processes performed by this equipment. There are no NSPS or NESHAPs that can be used to establish a floor for PM emission rates from these units. Similar scrap handling equipment on edge trimming lines generally implement the same PM/PM_{10}/$PM_{2.5}$ emissions minimization and add-on control techniques as those proposed for the Bay Minette project. Novelis has prepared this case-by-case BACT evaluation for PM emissions to determine if any add-on controls specifically targeting PM removal are technically feasible and cost effective. Based on a review of technical literature and past control technology determinations, following technologies/ other work practice standard-type control options could be potentially applied to control PM emissions from the Scrap Baller:

- Fabric Filter (Baghouse)
- Electrostatic Precipitators
- Wet Scrubbers
- Cyclones

8.6.4.2 Technically Feasible PM/PM_{10}/$PM_{2.5}$ Control Technologies for Edge Trimmer Scrap Baller

The technical feasibility of each of the control technologies for the Scrap Baller is described below. Aluminum fines are the primary particulate type for this scrap handling operation.

Fabric Filters (Baghouses) for Edge Trimmer Scrap Baller

Fine particles of aluminum generated by the Scrap Baller and transported in the pneumatic conveying systems have an inherent explosion risk due to the fine dust that is generated.[19] The Aluminum Association suggests that special consideration should be given to hazards, specifically explosivity, associated with the use of baghouses and other dry control methods for particulate control of aluminum dust. Based on the health and safety risks related to the explosivity hazards associated with the use of dry control technologies,

[19] The Aluminum Association, *Guidelines for Handling Aluminum Fines Generated During Various Aluminum Fabricating Operations,* May 2015

Novelis has only considered specially designed wet scrubbers with specific features included for combustible dust management as technically feasible PM control techniques for application to the raw exhaust stream from a Scrap Baller operation. Therefore, a fabric filter based PM control option would only be available/technically feasible if located downstream of the wet scrubber required for combustible dust mitigation.

The filterable PM emissions performance levels achieved by the Scrap Baller wet scrubber and demister (20 mg/m^3 or 0.0087 gr/ft^3) is effectively equivalent to the filterable PM emissions performance achievable for the type of small filtration unit that could be installed on the Scrap Baller's wet scrubber discharge. EPA indicates the inlet pollutant loading to a baghouse can be as low as 0.05 gr/ft^3 "in extreme cases", but the Scrap Ballers treated exhaust stream downstream from the wet scrubber would have a PM concentration which is more than five times lower than this minimum applicable inlet loading for fabric filters.[20] Therefore, adding a fabric filter downstream of the wet scrubber is expected to provide no meaningful additional PM emissions reduction beyond the already low PM emissions levels achieved by the wet scrubber. Despite this potential limitation of applying fabric filtration to the wet scrubber exhaust, Novelis has chosen to retain this control option in the remaining steps of the PM/PM$_{10}$/PM$_{2.5}$ BACT analysis for the sake of conservatism and in the spirit of developing a complete and thorough PM/PM$_{10}$/PM$_{2.5}$ BACT review and to assist in agency review of this PSD application.

Electrostatic Precipitators for Edge Trimmer Scrap Baller

As is the case with fabric filter control technologies, dry ESPs are not recommended for control of particulates from the cutting and/or scalping of aluminum. This control method has a risk of static electrical charge buildup, which may result in an increased risk of explosion of the aluminum fines. Wet ESPs would not have this risk; however, ESPs are not suited for use in processes which are highly variable because they are very sensitive to fluctuations in gas stream conditions (flow rates, temperatures, particulate and gas composition, and particulate loadings).[21] The variable nature of the particulate loadings of the exhaust streams from Scrap Baller would make this option challenging to implement. Furthermore, the RBLC search did not identify any instances of an ESP being used on a similar source, so using a wet ESP on the Scrap Baller would represent a first of its kind application. A wet ESP is eliminated on the basis of technical infeasibility for the low flow capacity and low PM emissions generating Scrap Baller, following a similar rationale to that applied for fabric filters.

Wet Scrubbers for Edge Trimmer Scrap Baller

The typical wet scrubber emission stream characteristic ranges encompass the design air flow, temperature, and minimum PM inlet concentration of the Scrap Baller. Therefore, select types of wet scrubbers which can meet Novelis combustible dust management requirements are considered to be technically feasible.

Cyclones for Edge Trimmer Scrap Baller

The typical cyclone emission stream characteristic ranges encompass the design air flow and temperature of the Scrap Baller; however, the outlet concentration of the wet scrubber required for combustible dust management is orders of magnitude lower than the minimum cyclone inlet loading of 0.44 gr/scf.[22] Cyclones perform more efficiently with higher pollutant loadings and given that the Scrap Baller already includes a

[20] EPA, *Air Pollution Control Technology Fact Sheet: Fabric Filter - Pulse-Jet Cleaned Type (also referred to as Baghouses).* EPA-452/F-03-025.

[21] EPA, *Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) – Wire-Pipe Type.* EPA-452/F-03-030.

[22] EPA, *Air Pollution Control Technology Fact Sheet: Cyclones.* EPA-452/F-03-005.

more effective PM control option (i.e., a wet scrubber), adding a cyclone to the wet scrubber is not considered technically feasible because it would provide no further PM emissions removal. Furthermore, the RBLC search did not identify any instances of a cyclone being used on a similar source. Therefore, cyclones as a control technology are not addressed in the remaining steps of the BACT evaluation for the Scrap Baller.

8.6.4.3 Effectiveness Ranking of $PM/PM_{10}/PM_{2.5}$ Control Technologies for Edge Trimmer Scrap Baller

The remaining control technologies for the Scrap Baller are ranked in order of control efficiency in **Table** 8-1.

Table 8-1. Remaining PM Control Technologies Ranked for Edge Trimmer Scrap Baller

Emission Unit	Control Technology	Control Efficiency
Edge Trimmer Scrap Baller	Fabric Filter (Baghouse)	95-99%[23]
	Wet Scrubber (Venturi)	70-99+%[24]

8.6.4.4 Economic, Environmental, and Energy Impacts of $PM/PM_{10}/PM_{2.5}$ Control Technologies for Edge Trimmer Scrap Baller

According to EPA documentation, the annualized cost of implementing a fabric filter for PM control ranges from $6.00 to $39.00 per scfm of exhaust flow in 2003 dollars or $12.18 to $79.17 per scfm in 2022 dollars.[25] Even when using the lower bound of this cost range ($12.18 scfm) with the upper bound filterable PM control efficiency (99%) that could theoretically be achievable with a fabric filtration system applied for reducing PM emissions from the Scrap Baller wet scrubber exhaust stream, the control costs would still exceed $37,432 per ton of PM captured.[26] Therefore, a fabric filter is not cost effective for the control of PM emissions from the Scrap Baller and is eliminated from BACT consideration.

Since the next most efficient control technology identified by Step 3 (i.e., venturi-type, water-based wet scrubber) will be implemented as BACT, no further discussion of economic, environmental, and energy impacts is needed for this BACT assessment.

---

[23] EPA, *Air Pollution Control Technology Fact Sheet: Fabric Filter - Pulse-Jet Cleaned Type (also referred to as Baghouses).* EPA-452/F-03-025.

[24] EPA, *Air Pollution Control Technology Fact Sheet: Venturi Scrubber.* EPA-452/F-03-017.

[25] EPA, *Air Pollution Control Technology Fact Sheet: Fabric Filter-Pulse-Jet Cleaned Type.* EPA-452/F-03-025. Inflation adjusted costs determined from Chemical Engineering Plant Cost Index (CEPCI) ratio between April 2022 and calendar year 2003 (816.3 in April 2022/402.0 in 2003 = 2.03 inflation adjustment factor). Dollar value is conservatively held at 2022 to be consistent with all other control cost data presented in the original PSD application.

[26] For the Scrap Baller, the fabric filter cost effectiveness is calculated as follows: ($12.18 per scfm x 6,100 Nm3/hr x 35.31 ft^3/m^3 x 1 hr/60 min)/(1.18 tpy filt. PM generated x 99% PM control eff.) = $37,432/ton.

8.6.4.5 BACT Selection for PM/PM_{10}/$PM_{2.5}$ for Edge Trimmer Scrap Baller

Novelis proposes use of a wet scrubber as BACT control for PM emissions from the Scrap Baller to achieve compliance with a proposed filterable PM/PM_{10}/$PM_{2.5}$ BACT limit of 0.27 lb/hr. The design of the Scrap Baller operation includes a wet scrubber with integral demister for combustible dust management which cannot readily be changed for the purposes of air pollutant emissions minimization. Regardless, this selected Scrap Baller design and the resulting emission factors are consistent with non-BACT information found in similar source permit applications. Compliance with the proposed particulate emission limits will be demonstrated by operating and maintaining the process units and control devices in accordance with the manufacturer's recommendations, instructions, and/or operating manual(s), with any modifications as deemed necessary by Novelis.

8.7 Air Quality Analysis Updates

As shown in the "plot plan" (looking down) views in **Figure 8-1** and 3D/elevation (looking across) views in **Figure 8-2**, the primary as-built changes for the Coil Finishing process area with the potential to influence the air quality analysis include the following items. Refer to Figure A-4 of **Appendix A** for the overlayed building layout comparing the as-permitted and as-built Coil Finishing process area configurations:

- The Coating Line RTO (CL1) stack moved north along the same west side of the main Coil Finishing building approximately 440 ft. The as-built CL1 stack location is now closer to low-roof (25.9 to 33.7 ft) support buildings that provide coating and chemical delivery and storage capability (BLDG18 to BLDG20).
  - As shown in **Figure 8-3**, the as-permitted location of the CL1 stack carried no building downwash effects for winds of out of the west. However, the new as-built location of the CL1 stack shows a relatively narrow west and west-northwest wind sector which is expected to introduce minor downwash effects from the low-roof height coating and chemical delivery and storage building (BLDG20) relative to the much taller CL1 stack (~95 ft). Source-distances for this as-built CL1 stack location for wind out of the west and west-northwest are greater than for winds out of the southeast and northeast directions. Also, the significant reduction in modeled hourly and annual emission rates for all criteria pollutants associated with the as-built changes to the Coating Line process equipment and control device is generally expected to reduce modeled impacts driven by the CL1 stack.
- The main Coil Finishing Building (FNSH) has retained the same basic rectangular shape, location, and maximum roof height between the as-permitted and as-built configurations, but the footprint and maximum roof height for the Finishing High Bay building (FNSHHBAY) have increased in the as-built configuration based on the final vendor selected equipment specifications and process layout (from approximately 103 ft long, 106 ft wide, and 106 ft tall in the as-permitted configuration to approximately 180 ft long, 103 ft wide, and 120 ft tall in the as-built configuration).
  - As shown in **Figure 8-4**, the Finishing High Bay building with the lower maximum roof height of ~106 ft served as the controlling structure for building downwash effects on the as-permitted CL1 stack location for a relatively narrow wind sector covering winds out of the west-northwest and with a very small distance between the stack location and closest building edge (~52 ft). In the as-built CL1 stack location, the taller roof height (~120 ft) and larger footprint Finishing High Bay building becomes the controlling downwash structure for a different narrow wind sector covering winds out of the north and with a much larger distance between the stack location and closest building edge (~237 ft). The vast majority of wind sectors where downwash effects are present for the CL1 stack are not changing between the as-permitted and as-built configurations because the dimensions, location, and height of the main Coil Finishing building which acts as the predominant downwash structure are effectively the same.

- The Alkaline Cleaning Line Scrubber stack (ALKCLN1) remained at approximately the same north-south position along the main Coil Finishing building but moved from a "freestanding" stack located approximately 90 ft from the closest edge of the main Coil Finishing Building to a more sensible layout and location running along the side of the main Coil Finishing Building closer to the underlying process.
  - The ALKCLN1 stack would now have minor downwash effects from the main Coil Finishing building and the Finishing High Bay building for effectively the same wind sectors with similar downwash intensity, such that the relatively small west-to-east move of the stack between the as-permitted and as-built configurations is not expected to result in significant changes to downwash-driven modeled impacts. Furthermore, the ALKCLN1 is a small source of $PM_{10}/PM_{2.5}$ (<1 tpy) which is not expected to significantly contribute to the maximum impact locations for the Bay Minette facility regardless of the stack's position around the main Coil Finishing Building.
- The Edge Trimmer- Scrap Baller Scrubber Stack (ETSB) is located on the northeast quadrant of the main Coil Finishing Building and has a stack height (88 ft) which extends approximately 3 ft above the maximum roof height of the building (84.8 ft). The hourly potential $PM_{10}/PM_{2.5}$ emission rate for the ETSB stack (0.27 lb $PM_{10}/PM_{2.5}$/ hr) is very low (<8%) in comparison to the combined $PM_{10}/PM_{2.5}$ hourly potential emission rates from the CL1 and ALKCLN1 stack in the as-permitted configuration (4.25 lb PM_{10}/hr and 3.62 lb $PM_{2.5}$/hr). In addition, the reduction in modeled $PM_{10}/PM_{2.5}$ emission rates for the CL1 and ALKCLN1 stacks between the as-permitted and as-built configurations is greater than the hourly potential $PM_{10}/PM_{2.5}$ emission rates associated with this newly added source.
- As shown in **Table 8-2** and **Table 8-3**, the ALKCLN1 stack remained at effectively the same height, increased in stack temperature, decreased in flow rate and exit velocity, and increased in diameter between the as-permitted and as-built configurations. The CL1 stack has effectively the same stack height, a lower stack temperature (from 842 deg. F in the as-permitted configuration to 428 deg. F in the as-built configuration), lower exhaust flow rate (from 137,844 acfm in the as-permitted configuration to 62,676 acfm in the as-built configuration), lower exit velocity (from 36.1 ft/s in the as-permitted configuration to 30.9 ft/s in the as-built configuration), and smaller stack diameter (from 9.0 ft in the as-permitted configuration to 6.6 ft in the as-built configuration).
  - Collectively, the CL1 stack parameter changes are reflective of the lower exhaust flow capacity and burner firing rates of the Coating Line curing ovens and RTO and are generally considered to be proportionate with the corresponding reductions in modeled emission rates for all criteria pollutants. The only stack parameter change which is not directly associated with the change in Coating Line RTO flow capacity and other sizing updates is the reduction in stack temperature. The lower as-built stack temperature reflects more heat recovery from the RTO outlet exhaust stream which improves the overall thermal efficiency of the Coating Line curing ovens. Despite the decrease in stack temperature from the as-permitted to as-built configuration, the absolute value of the as-built stack temperature for the CL1 stack (428 deg. F) is still high relative to other combustion source stacks at the Bay Minette facility such that buoyancy-based plume rise is still expected to be significant from the CL1 stack in both the as-permitted and as-built configurations.

Figure 8-1. Coil Finishing Area As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View)

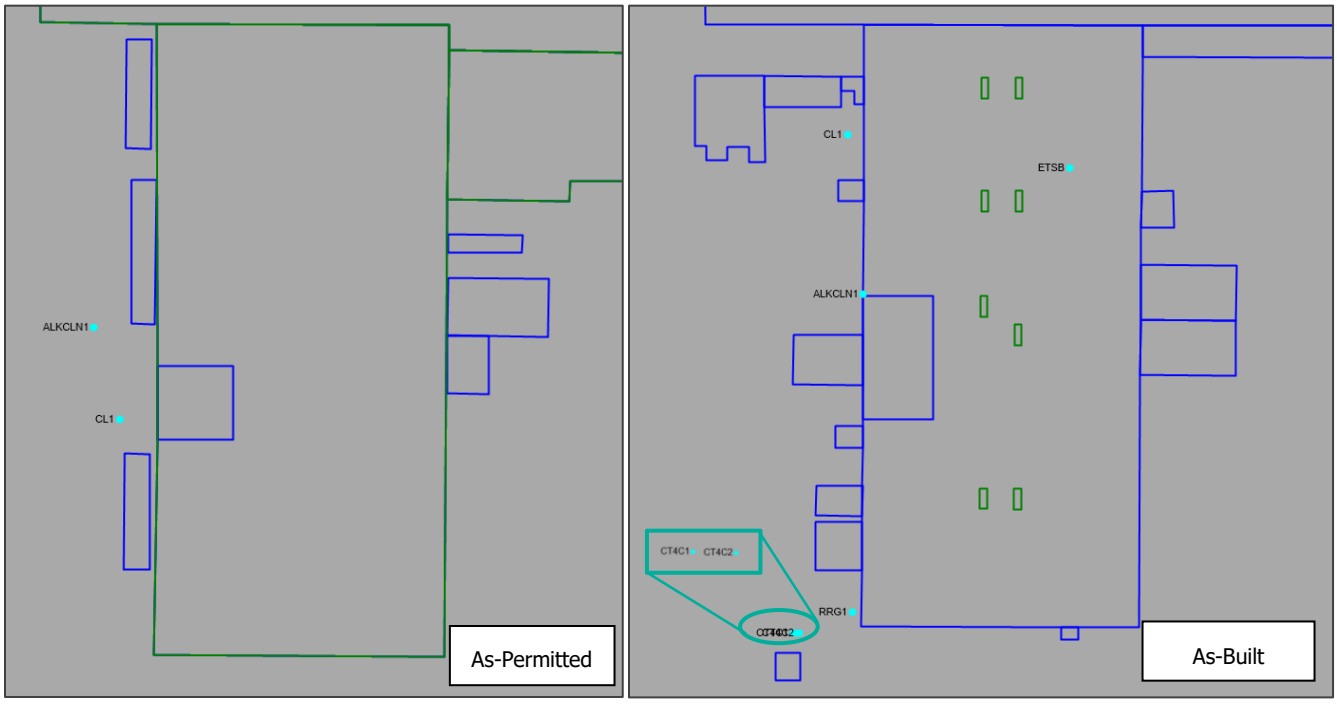
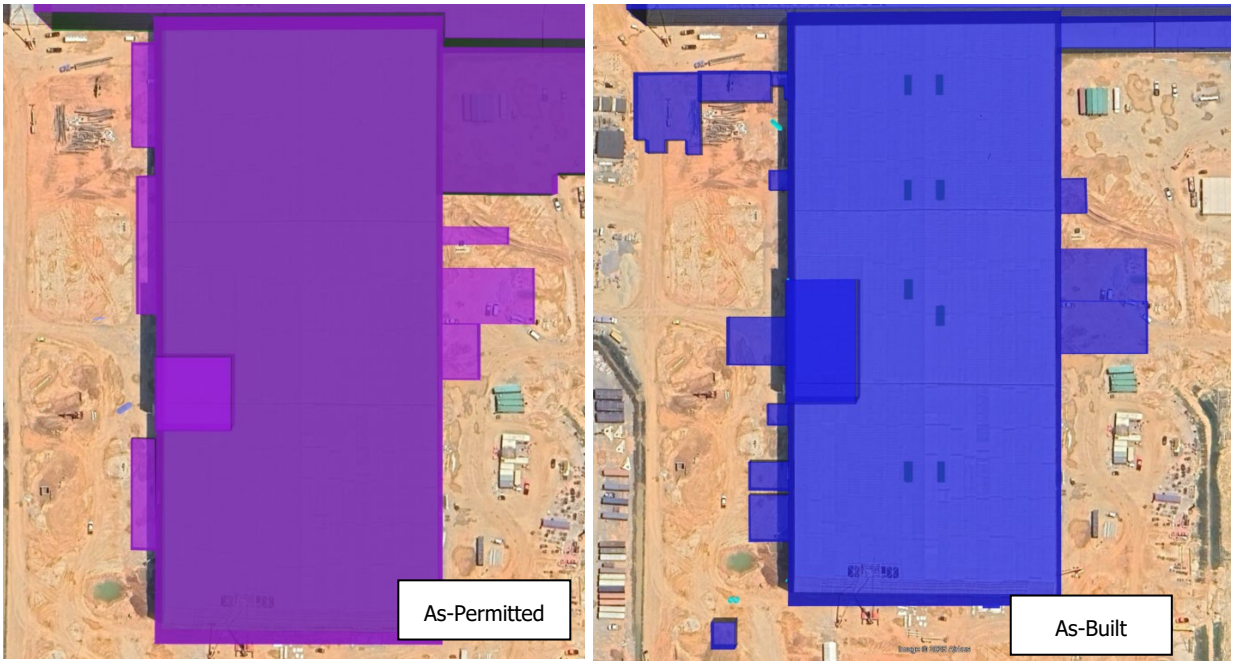


Figure 8-2. Coil Finishing Area As-Permitted vs. As-Built Modeling Setup Comparison (3D/Elevation View)



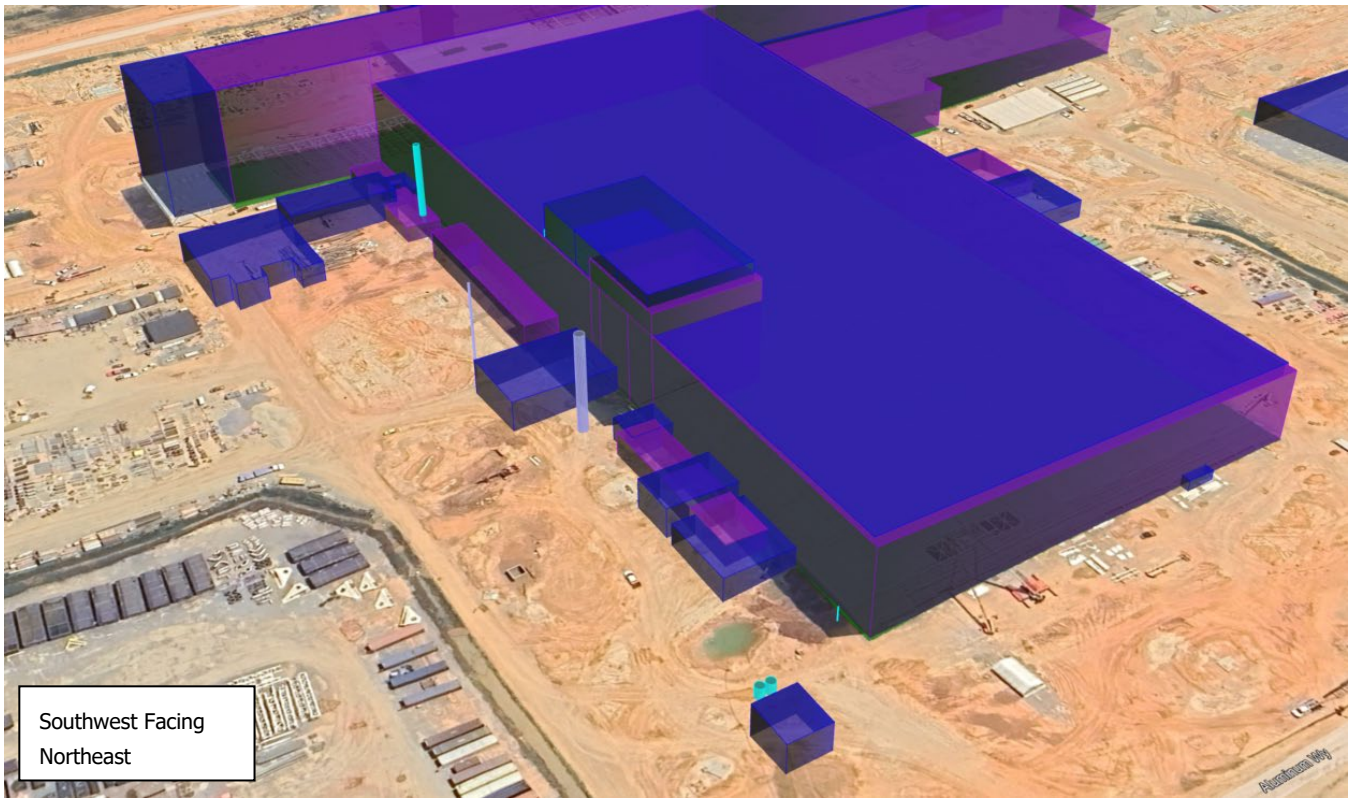

Southwest Facing
Northeast

Figure 8-3. Coating Line RTO (CL1) As-Permitted vs. As-Built Downwash Parameter Comparison (3D/ View) – Winds Out of West

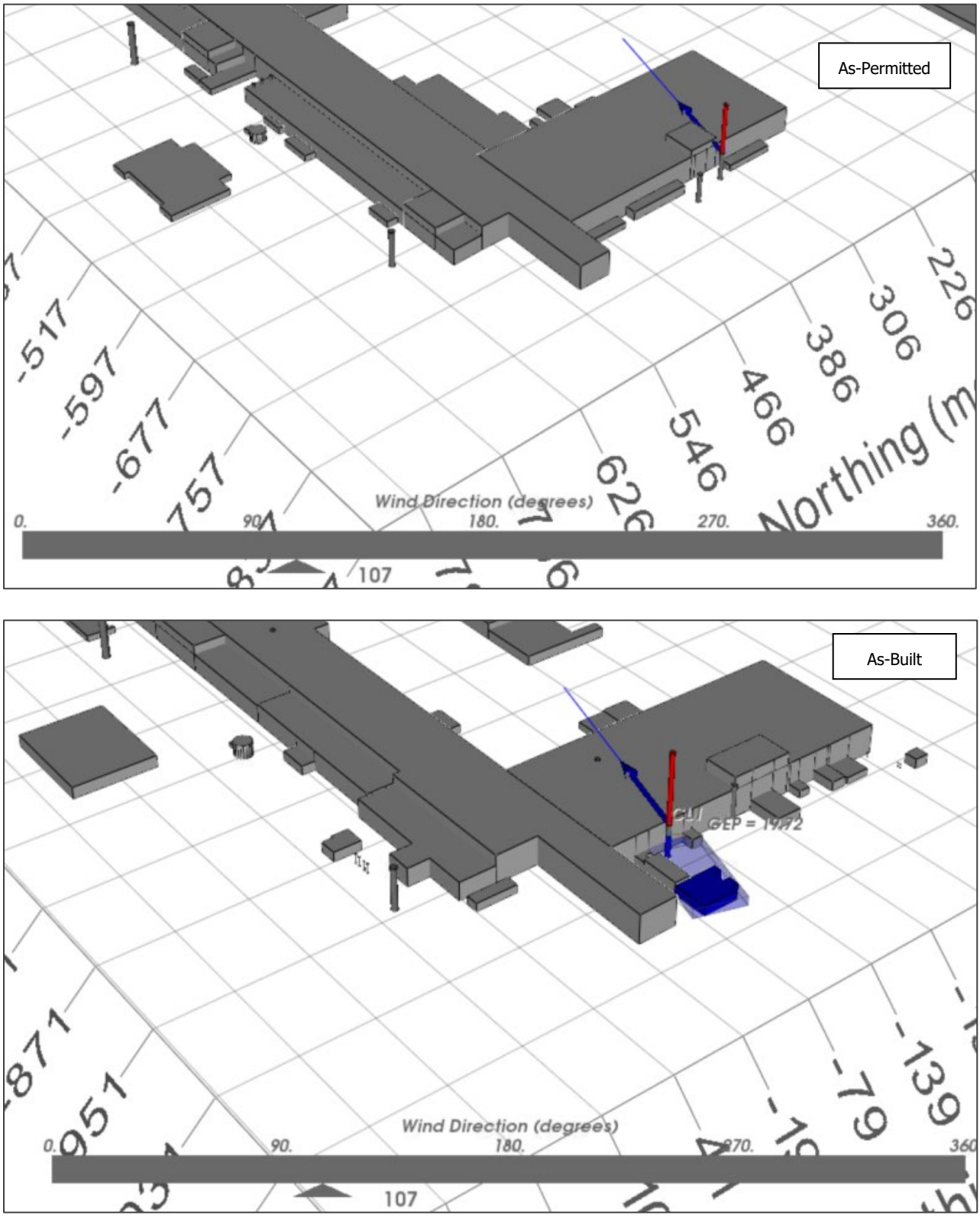


Figure 8-4. Coating Line RTO (CL1) As-Permitted vs. As-Built Downwash Parameter Comparison (3D/ View) – Finishing Mill High Bay Influenced Wind Sectors

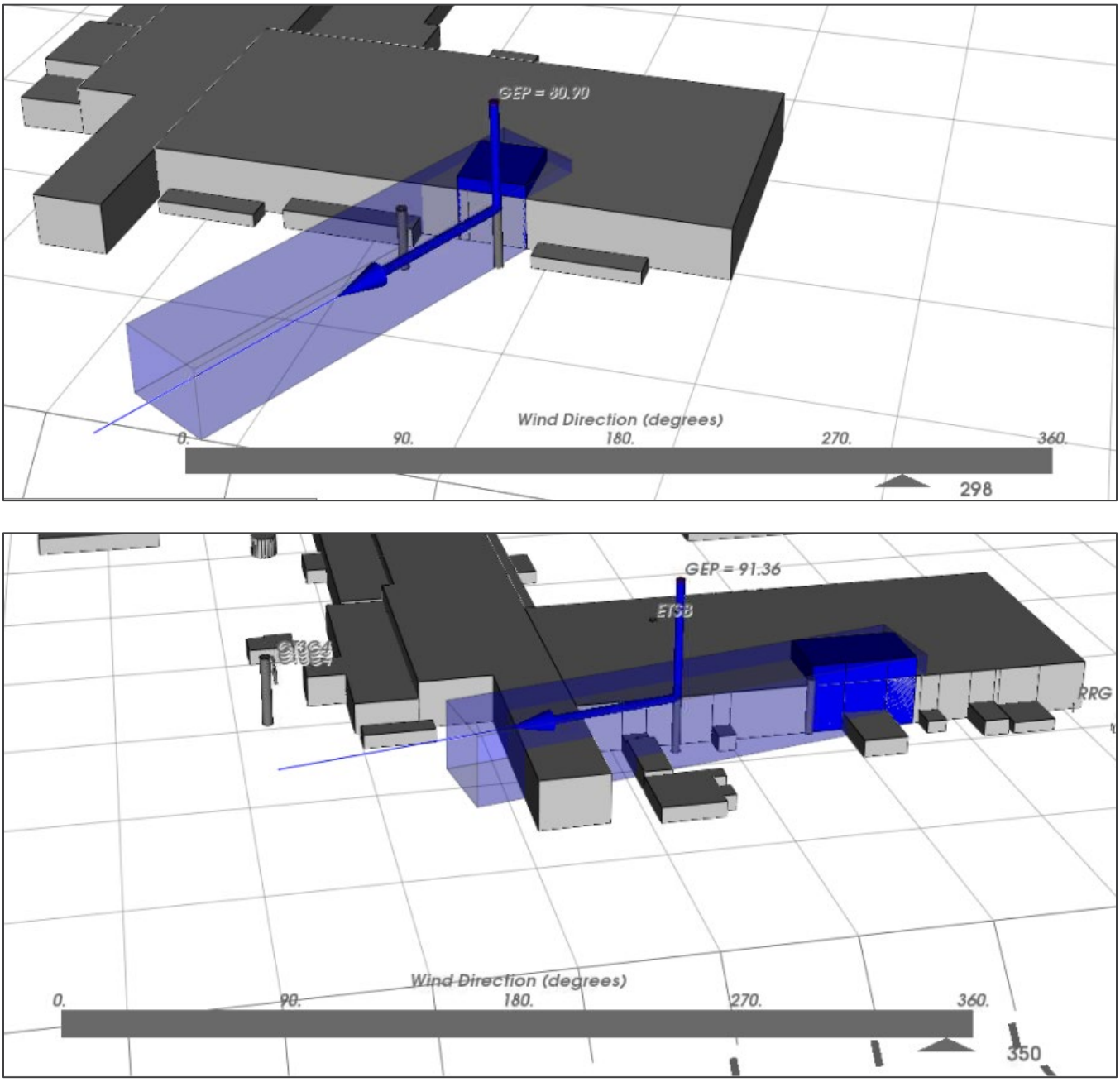


Table 8-2. As-Permitted Modeling Input Parameters for Coil Finishing Area Point Sources

Model ID	Emission Point Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
ALKCLN1	Alkaline Cleaning Line #1 (Can Coating Line) Scrubber Stack	428,499.27	3,424,335.30	265.0	V	97.2	140.0	5,240	31.2	1.89
CL1	Coating Line #1 RTO Stack	428,510.54	3,424,295.94	265.0	V	95.0	842.0	137,844	36.1	9.00

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment. A 0 deg. F temperature is used to flag an ambient release (based on inputting 0 K to AERMOD to trigger this option). A -10 deg. F temperature is assigned to represent a cooling tower release temperature that is 10 deg. F below ambient temperature.

Table 8-3. As-Built Modeling Input Parameters for Coil Finishing Area Point Sources

Model ID	Emission Point Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
ALKCLN1	Alkaline Cleaning Line #1 (Can Coating Line) Scrubber Stack	428,527.35	3,424,345.92	265.0	V	98.0	131.0	7,653	41.8	1.97
CL1	Coating Line #1 RTO Stack	428,520.64	3,424,417.27	265.0	V	95.1	428.0	62,676	30.9	6.56
ETSB	Edge Trimmer- Scrap Baller Scrubber Stack	428,619.50	3,424,402.47	265.0	V	88.0	Amb.	3,590	45.1	1.3

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment. A 0 deg. F temperature is used to flag an ambient release (based on inputting 0 K to AERMOD to trigger this option). A -10 deg. F temperature is assigned to represent a cooling tower release temperature that is 10 deg. F below ambient temperature.

9. BALANCE OF PLANT AUXILIARY SYSTEMS

The Auxiliary Systems emission unit grouping contains two main categories of source types: 1) balance of plant (BOP) sources which provide utilities or critical functions to the process equipment but are not directly associated with any of the core process areas, and 2) process support operations which are affiliated with a process area but are not directly integrated with manufacturing products. The as-built changes to the Auxiliary Systems in the BOP category are addressed in this **Section 9**, and the Auxiliary Systems in the process support category are addressed in the next **Section 10**.

9.1 Process Equipment Changes

9.1.1 Updates to As-Permitted Process Equipment Specifications

As documented in the Emission Unit Index in **Appendix A** and further detailed in Section 25 of **Appendix C**, the number of cells of the Caster Cooling Tower #1 (AS-04) and associated cooling water recirculating flow rate and the name, number of cells, and cooling water recirculating water flow rate for the Hot Mill Cooling Tower (AS-05) (formerly designated as the General Plant Cooling Tower in the as-permitted configuration) have been updated to reflect the final engineering design basis for the affected cooling water systems.

As documented in the Emission Unit Index in **Appendix A** and further detailed in Section 27 of **Appendix C**, the first Fire Pump Engine #1 (AS-15) has been redesignated as being associated with the "North Pump House" in place of a prior "South Pump House" originally included in the initial PSD permit application, and the engine rating and associated maximum hourly and annual fuel usage rates for all Fire Pump Engines #1, #3, and #4 (AS-15, AS-16, and AS-17) have been updated to match the final engineering design basis of the firewater supply systems for the Bay Minette facility.

9.1.2 Removal of As-Permitted Equipment

During the course of project design engineering and subsequent construction, several pieces of equipment were removed from the as-permitted basis for the air permit as a result of design changes that were made for the as-built configuration of the finished plant. Permitted equipment was removed from the Auxiliary Systems equipment scope, as follows:

- Hot Water Boilers #1 through #3 (AS-01 through AS-03);
- Four (4) emergency engines,
  - Emergency Generator Engine #3 (Remelt Cold End) (AS-08),
  - Emergency Generator Engine #4 (Remelt Hot End) (AS-09),
  - Emergency Generator Engine #8 (Coating Line) (AS-13), and
  - Emergency Generator Engine #9 (Edge Trimmer) (AS-14);
- Fire Pump Engine #2 (South Pump House) (AS-16); and
- One (1) 5,000 gallon Diesel Fuel Storage and Refueling Station (AS-21).

9.1.3 Addition of New Emission Units

New emission units in the balance of plant Auxiliary Systems category were added to the project scope during construction as engineering designs for the associated utility, power supply, and firewater systems changed and evolved since the start of construction. However, no new types of Auxiliary Systems have been added to the balance of plant scope since the initial PSD permitting effort. Rather, different numbers and

sizes of the cooling towers, building heating systems, emergency generator engines, and diesel storage and refueling systems are included in the as-built engineering design basis of associated utility, backup power, and fuel supply systems.

9.1.3.1 New Cooling Towers

Three (3) additional cooling towers listed below are included in the as-built equipment scope to meet the cooling water needs of the primary process equipment in their final as-built configuration. The total cooling tower recirculating water flow rate in the as-permitted configuration (38,800 gal/min) has increased slightly (~10%) in the as-built configuration (42,960 gal/min) despite increasing the total number of cooling towers from two (2) in the as-permitted configuration to five (5) in the as-built configuration.

- Cold Mill Cooling Tower (AS-26),
- Finishing Cooling Tower (AS-27), and
- Round Tops/Pushers Cooling Tower (AS-28).

9.1.3.2 New/Updated Building Heating Systems

The number of units and total heat input capacity comprising the Building Heating Systems (AS-19) increased primarily due to a significant increase in the number of required HVAC units that were determined to be necessary to meet the building air cooling needs of the main production buildings. Significant air cooling capacity for the main production buildings is necessary for the protection of certain critical operating equipment (i.e., upper bay material transfer cranes in each of the process areas) that must be maintained to a certain minimum ambient temperature to prevent equipment failure which would have the effect of shutting the process down. Since the process within the large operating buildings is already hot and with the location of the Bay Minette facility in the climate of Southern Alabama, it was crucial to ensure that there was sufficient air cooling to protect this equipment from damage.

In order to accomplish this goal to meet the increased demand for cooling air, the make-up air unit (MAU) systems associated with the as-built configuration of the Bay Minette facility were sized to provide the necessary building air cooling using a "once through" design concept as opposed to using recirculating building air. Achieving building cooling via this once-through design concept requires MAU systems with much larger short-term air flow rates and associated cooling and heating capacity than the preliminary engineering design concepts used in the as-permitted configuration (i.e., 56 heating units with the same heat input rate of 1 MMBtu/hr).

Without making drastic engineering design changes that would affect the air flow and heat balance within the main production building or installing separate and redundant heating units that are not integrated into a single MAU with both heating and cooling functions, Novelis had to move forward with the direct-fired burners included with these "packaged" MAU systems which are determined based on their air flow capacity. The air flow capacity of each MAU was selected to maintain the key summertime building air cooling functionality while minimizing the additional equipment needed for wintertime heating. Although the higher air flow rate MAU systems have a higher short-term installed burner heat input capacity, the building heating function of the MAU systems would not be expected to approach anything near full design capacity even on a single operating day due to the significant heat generated by Novelis' process operations and the warm temperate climate in South Alabama for a majority of the year.

Through local available weather data and thermodynamic analysis, a fractional capacity factor was determined to estimate a more realistic maximum daily usage rate of the building heating systems when operating as a group to maintain the temperature of the production buildings during the limited colder

winter periods of the year. For more information regarding the fractional capacity factor see **Section 9.2.4** and Section 28 of **Appendix C**.

In the as-permitted configuration, fifty-six (56) similarly sized, small units designed for the building heating systems were identified. In the as-built configuration, a total of sixty-six (66) units with varying heat input capacity are being installed across the Bay Minette facility. The Building Heating Systems (AS-19) emission unit category now consists of the following emission units in the as-built configuration:

Main Production Building Make-Up Air Units

- Building Heating Systems (30 MAU @ 11.55 MMBtu/hr Each) (AS-19a),
- Building Heating Systems (4 MAU @ 7.50 MMBtu/hr Each) (AS-19b),
- Building Heating Systems (2 MAU @ 3.75 MMBtu/hr Each) (AS-19c), and
- Building Heating Systems (1 MAU @ 2.25 MMBtu/hr Each) (AS-19d).

Central Maintenance Building Unit Heaters

- Building Heating Systems (7 @ 0.175 MMBtu/hr Each) (AS-19e),
- Building Heating Systems (12 @ 0.150 MMBtu/hr Each) (AS-19f),
- Building Heating Systems (6 @ 0.105 MMBtu/hr Each) (AS-19g), and
- Building Heating Systems (4 @ 0.045 MMBtu/hr Each) (AS-19h).

9.1.3.3 New Emergency Generator Engines

Four (4) additional emergency engines listed below are included in the as-built equipment scope to meet the backup power needs of the primary process equipment in their final as-built configuration. The combined engine rating for all emergency generator engines has decreased significantly (~35%) between the as-permitted configuration (2,736 hp) and as-built configuration (1,788 hp).

- Emergency Generator Engine #10 (Maintenance Bldg) (AS-29),
- Emergency Generator Engine #11 (Decoater #1) (AS-30),
- Emergency Generator Engine #12 (Decoater #2) (AS-31), and
- Emergency Generator Engine #13 (Decoater #3) (AS-32).

9.1.3.4 New Diesel Fuel Storage and Refueling Stations

The diesel fuel storage system for the Bay Minette facility was redesigned to contain four (4) tanks instead of the original configuration of two (2) tanks. To replace the lost capacity due to the removal of a second tank and refueling station included in the as-permitted configuration, the remaining single tank and refueling station in the as-built configuration was increased in storage capacity from 5,000 gal in the as-permitted configuration to 15,000 gal in the as-built configuration.

To serve as fuel storage for the diesel fired fire pump engines, three (3) 572 gallon capacity diesel storage tanks were installed in close proximity adjacent to the engines. Two (2) tanks were installed in the West Pump House while one (1) was installed at the North Pump House (note the redundant fire pump in the North Pump House is supported through electricity thereby reducing a fourth diesel fuel storage and refueling system).

All tanks and the refueling station are covered under one (1) emission unit designation [i.e., Diesel Fuel Storage and Refueling Stations (4) (AS-21)].

9.1.3.5 New/Updated Paved Haul Road Routes

As documented in Section 32 of **Appendix C**, the same basic haul truck types, material types, and storage areas from the as-permitted configuration were carried forward into the as-built configuration, but the vehicle miles travelled were updated to reconcile to the as-built route distances and process rates for materials being received/shipped.

9.2 Air Emissions Changes

9.2.1 Cooling Towers Air Emissions Quantification

The cooling towers at the Bay Minette facility are all multi-cell mechanical draft, wet cooling towers with drift eliminators. The cooling towers emit PM/PM_{10}/$PM_{2.5}$ due to the presence of total dissolved solids (TDS) present in the cooling water. Droplets of water containing TDS are picked up by the draft air and emitted from the top of the tower. Once the water evaporates, the TDS are left as PM emissions in the ambient air. The methodology for estimating the emissions from the cooling towers has not changed from the method presented in the initial PSD application. The PM emissions for the cooling towers continued to be estimated based on the methodology presented in AP-42 Chapter 13.4.[27] Particle size distribution data is sourced from "Calculating Realistic PM10 Emissions from Cooling Towers".[28]

Each tower's mist eliminator is designed to achieve a drift percentage of 0.001%, and it is conservatively assumed that the cooling towers would operate continuously (i.e., 8,760 hrs/yr). The total dissolved solids (TDS) present in the water are conservatively assumed to be 1,000 ppm. The drift percentage, annual operating hours, and cooling water TDS content engineering estimates used in the as-permitting potential emission calculations have been retained in the as-built calculations. As summarized in Table 1-1.3 of **Appendix C**, combined PM emissions from cooling towers have increased by a very small amount (<0.1 tpy) due to the small increase in recirculating cooling water flow rate reflected in the as-built configuration. Detailed emission calculations for cooling tower emission units (AS-04, AS-05, and AS-26 through AS-28) are presented in Section 25 of **Appendix C**.

9.2.2 Emergency Generator Engines Air Emissions Quantification

In the as-built configuration, the same number of nine (9) emergency engines as included in the initial PSD permit package are planned to be operated at the Bay Minette facility. All emergency engines are natural gas-fired and will emit typical combustion byproduct pollutants (e.g., PM, NO_X, CO, VOC, SO_2, GHGs, and organic HAP). All engines planned to operate at the Bay Minette facility have EPA Certificates of Conformity which can be found as attachments to the ADEM Form 107 files included in **Appendix D**. No changes to the underlying emissions estimation methodology for emergency generator engines are included in the as-built calculation updates. The emission factors used are slightly different for each engine due to the different sizes, burn types (i.e., rich burn or lean burn), and manufacturers; however, the same combination of technical references was used to obtain the emission factors. The following list of sources for emission factors were consulted in the listed order for all pollutants: manufacturer's emissions related data, NSPS Subpart JJJJ emissions standards,[29] Subparts A and C of the Mandatory Greenhouse Gas Reporting Rule

[27] "AP-42: Compilation of Air Emissions Factors from Stationary Sources - Chapter 13.4: Wet Cooling Towers", EPA, (January 1995).

[28] "Calculating Realistic PM10 Emissions from Cooling Towers", Joe Reisman and Gordon Frisbie, Environmental Progress, Volume 21, Issue 2 (April 20, 2004).

[29] EPA, "40 CFR Part 60 Subpart JJJJ -- Standards of Performance for Stationary Spark Ignition Internal Combustion Engines".

(GHG MRR),[30] AP-42 Chapter 3.2,[31] and AP-42 Chapter 1.4.[32] All PM emitted is conservatively assumed to be less than 2.5 microns in diameter; therefore, PM, PM_{10}, and $PM_{2.5}$ are equivalent. All emergency generator engines are assumed to qualify for coverage as emergency engines and are assigned a worst-case annual operating level of 500 hr/yr. Section 26 of **Appendix C** contains detailed emissions calculations and assumptions for all emergency engine emission units (AS-06 through AS-14 and AS-29 through AS-32).

9.2.3 Fire Pumps Air Emissions Quantification

The as-built configuration of the North and West Pump House included four (4) engines that drive emergency fire pumps. However, one (1) engine in the North Pump House is electrically powered and thus is not a considered a source of regulated air pollutant emissions. The remaining three (3) fire pumps use diesel-driven engines which will emit typical diesel combustion byproduct pollutants. These three (3) remaining Fire Pump Engines carry the following emission unit designations:

- Fire Pump Engine #1 (North Pump House) (AS-15),
- Fire Pump Engine #3 (West Pump House) (AS-17), and
- Fire Pump Engine #4 (West Pump House) (AS-18).

Records of Tier 3 certification for the Fire Pump Engines can be found as attachments to ADEM Form 107 in **Appendix D**. PM, CO, NO_X, and VOC (assumed HC equals VOC) were sourced from manufacturer's emissions specifications. All PM is conservatively assumed to be less than 2.5 microns in diameter (i.e., $PM=PM_{10}=PM_{2.5}$). SO_2 emissions and organic HAP emissions were pulled from AP-42 Chapter 3.4.[33] Metal HAP emissions were sourced from AP-42 Chapter 1.3,[34] and GHG emissions were determined from Subparts A and C of the GHG MRR. All Fire Pump Engines are assumed to qualify for coverage as emergency engines and are assigned a worst-case annual operating level of 500 hr/yr. Detailed emission calculations and emission factors sources can be found in Section 27 of **Appendix C**.

9.2.4 Building Heating Systems Air Emissions Quantification

The sixty-six (66) units within the Building Heating Systems (AS-19a through AS-19h) emission unit category use direct-fired natural gas burners which will emit typical natural gas combustion byproduct pollutants. All emission factors are sourced from AP-42 Section 1.4 and Subparts A and C of the GHG MRR. The maximum potential emissions are directly related to the amount of natural gas burned and the maximum heat input capacity. However, as discussed in **Section 9.1.3.2**, the MAU systems include significantly oversized short-term rated heating capacity for the actual heating duty that would be needed to warm the interior of the building on cooler months to balance with the more critical needed cooling system requirements in typically available single dual function heating and cooling compatible HVAC units.

To determine a more realistic short-term potential operating rate and associated emissions level for the building heating systems, a maximum daily average capacity factor was determined on an individual MAU category basis. The capacity factor was determined by estimating the natural gas usage rate necessary for the heater to increase the temperature of the air within the MAU from 27°F (average wintertime

[30] EPA, "40 CFR Part 98 -- Mandatory Greenhouse Gas Reporting", (April 2024).

[31] EPA, "AP-42 Chapter 3.2 -- Natural Gas-fired Reciprocating Engines", (October 2024).

[32] EPA, "AP-42 Chapter 1.4 -- Natural Gas Combustion", (July 1998).

[33] EPA, "AP-42 Chapter 3.4 -- Large Stationary Diesel and All Stationary Dual-fuel Engines", (April 2025).

[34] EPA, "AP-42 Chapter 1.3 -- Fuel Oil Combustion", (May 2010).

temperature in Bay Minette area) to 55°F (temperature determined as sufficient to protect equipment from cold temperatures). The short-term natural gas usage assigned to each MAU is dependent upon air flow capacity, air temperature rise associated with design conditions, heat capacity of air, density of air, and thermal efficiency of the selected MAU. Novelis is proposing to impose a daily average operating limitation (0.168 MMscf/hr) for the source-wide grouping of Building Heating Systems to support the basis of the modeled emission rates for the 24-hour PM_{10}, 24-hour $PM_{2.5}$, and 1-hour NO_2 modeling analysis and to align with the natural gas usage rate documentation in Section 30.1 of **Appendix C**. At the request of ADEM, Novelis is willing to accept an additional natural gas usage limitation for the Building Heating Systems expressed on a maximum hourly basis (0.390 MMscf/hr) in addition to the daily average limitation and the annual limitations initially proposed by Novelis.[35] This hourly natural gas usage level simply reflects the maximum installed burner heat input rating for the full collection of Building Heating Systems and cannot be exceeded in practice due to physical limitations of the proposed equipment. However, this additional hourly natural gas usage limitation will provide practical enforceability for ensuring that the maximum hourly natural gas usage rate of the Building Heating Systems will be consistent with the potential to emit calculations and the associated modeled emission rates for applicable deterministic hourly standards.

For annual natural gas usage, Novelis is proposing to impose an annual operating limitation (486.7 MMscf/yr) for the source-wide grouping of Building Heating Systems such that the total maximum annual potential natural gas usage would be equal to the original as-permitted configuration basis (shown in Section 28.1 of **Appendix C** in the initial PSD application submitted in November 2022). A ratio of the hourly natural gas usage rate extrapolated to continuous usage (8,760 hr/yr) and the as-permitted configuration was used to estimate the individual unit annual fuel consumption required to estimate the annual potential emissions on a unit-by-unit basis. Detailed emissions calculations and determination of natural gas consumption rates are presented in Section 28 of **Appendix C**.

9.2.5 Diesel Fuel Storage Air Emissions Quantification

The diesel storage tanks and integral refueling stations used for mobile equipment and fire pump engine refueling represent sources of VOC emissions from evaporative losses of stored material due to cyclical fluctuations in storage temperature (i.e., breathing losses), from vapor displacement caused when material is loaded into the tank (i.e., working losses), and from evaporative losses of material due to equipment refueling events (i.e., loading losses). Based on the low vapor pressure of diesel fuel, these units are insignificant sources of VOC emissions. The methodology for estimating annual potential VOC emissions from the as-built configuration of the diesel storage systems remains consistent with what was presented in the initial PSD application. Emissions are estimated for the diesel storage tanks using TankESP®. Section 30 of **Appendix C** contains a summary of the main tank parameters and emissions estimates associated with diesel storage tank emission units (AS-21) output from TankESP®.

9.2.6 Paved Haul Roads Air Emissions Quantification

PM emissions are generated when a vehicle travels on haul roads due to the turbulent air wake generated by the vehicle which causes silt on the road surface to become entrained within the air. The methodology used to estimate emissions has not changed from the initial PSD application. AP-42 Chapter 13.2.1 was used to estimate particulate emissions from the Paved Haul Roads (AS-25).[36] Details regarding vehicle types, vehicle weights, assumed routes, and site weather conditions can be found in Section 32 of **Appendix C**.

[35] Email from David DiFante (ADEM) to Steve Royer (Novelis), RE: Novelis Bay Minette- ADEM Information Request Response and Updated As-Built PSD Application, dated April 23, 2026.

[36] EPA, "AP-42 Chapter 13.2.1 – Paved Roads", (January 2011).

9.3 Suggested PSD Permit Changes

This section details the changes Novelis requests for permits covering Auxiliary Systems in the BOP category.

9.3.1 Hot Water Boiler (X019) PSD Permit Changes

- Novelis requests removal of the X019 permit in its entirety as no natural gas-fired hot water or steam generating systems are included in the as-built configuration of the Bay Minette facility. Any hot water or steam demands for process equipment will be met using heat recovery or electric heating systems.

9.3.2 Cooling Tower (X020) PSD Permit Changes

- Change the name of emission unit AS-05 from "General Plant Cooling Tower" to "Hot Mill Cooling Tower"
- Add the following emission units to the X020 permit:
  - AS-26 – Cold Mill Cooling Tower
    - Maximum Circulating Water Flow Rate = 12,000 gal/min
  - AS-27 – Finishing Cooling Tower
    - Maximum Circulating Water Flow Rate = 980 gal/min
  - AS-28 – Round Tops/Pushers Cooling Tower
    - Maximum Circulating Water Flow Rate = 1,400 gal/min
- Update the following maximum circulating water flow rates:
  - AS-04 – Caster Cooling Tower #1
    - Update from 7,800 gal/min in the as-permitted configuration to 10,580 gal/min in the as-built configuration
  - AS-05 – Hot Mill Cooling Tower
    - Update from 31,000 gal/min in the as-permitted configuration to 18,000 gal/min in the as-built configuration

9.3.3 Emergency Generator Engines and Fire Pump Engines (X021) PSD Permit Changes

Novelis requests the following changes to the X021 permit covering emergency engines.

- **Emergency Generator Engine Changes**
  - Remove the following emission units from the permit along with any associated requirements and emissions limitations
    - AS-08 – Emergency Generator Engine #3 (Remelt Cold End)
    - AS-09 – Emergency Generator Engine #4 (Remelt Hot End)
    - AS-13 – Emergency Generator Engine #8 (Coating Line)
    - AS-14 – Emergency Generator Engine #9 (Edge Trimmer)
  - Add the following emission units to the permit along with the following emission standards and associated requirements according to NSPS Subpart JJJJ
    - AS-29 – Emergency Generator Engine #10 (Maintenance Bldg)
      - Engine Rating: 304.0 HP
      - NSPS Subpart JJJJ Emission Standards for Emergency Natural Gas-Fired Engines with HP equal to or greater than 130 HP
        - $NO_X \leq 2.0$ g/HP-hr
        - CO ≤ 4.0 g/HP-hr

        - VOC ≤ 1.0 g/HP-hr
    - AS-30 – Emergency Generator Engine #11 (Decoater #1)
        - Engine Rating: 63.9 HP
        - NSPS Subpart JJJJ Emission Standards for Emergency Natural Gas-Fired Engines with HP between 25 HP and 130 HP
            - NO_X + HC ≤ 10 g/HP-hr
            - CO ≤ 387 g/HP-hr
        - NSPS Subpart JJJJ Requirements for Emergency Natural Gas-Fired Engines with HP between 25 HP and 130 HP
    - AS-31 – Emergency Generator Engine #12 (Decoater #2)
        - Engine Rating: 63.9 HP
        - Same NSPS Subpart JJJJ emissions standards and requirements as AS-30
    - AS-32 – Emergency Generator Engine #13 (Decoater #3)
        - Engine Rating: 63.9 HP
        - Same NSPS Subpart JJJJ emissions standards and requirements as AS-30
- Update The following engine rating changes not affecting the applicability of NSPS Subpart JJJJ or associated emissions limitations and requirements
    - AS-10 – Emergency Generator Engine #5 (Hot Reversing Mill)
        - Update from 304.0 HP in the as-permitted configuration to 160.9 HP in the as-built configuration
    - AS-11 – Emergency Generator Engine #6 (Hot Finishing Mill)
        - Update from 304.0 HP in the as-permitted configuration to 261.5 HP in the as-built configuration
    - AS-12 – Emergency Generator Engine #7 (Cold Mill)
        - Update from 304.0 HP in the as-permitted configuration to 160.9 HP in the as-built configuration

► **Fire Pump Engine Changes**

- Change the name of emission unit AS-15 from Fire Pump Engine #1 (South Pump House) to Fire Pump Engine #1 (North Pump House)
- Remove the following emission units from the permit along with any associated requirements and emissions limitations
    - AS-16 – Fire Pump Engine #2 (South Pump House)
- Update the following engine rating changes affecting the emissions standards required by NSPS Subpart IIII[37]
    - AS-15 – Fire Pump Engine #1 (North Pump House)
        - Update from 755 HP in the as-permitted configuration to 700 HP in the as-built configuration
        - Previously subject to the following emission limitations at 755 HP rating
            - NMHC + NO_X ≤ 4.8 g/HP-hr
            - CO ≤ 2.6 g/HP-hr
            - VOC ≤ 0.15 g/HP-hr
        - Now subject to the following emission limitations at 700 HP rating
            - NMHC + NO_X ≤ 3.0 g/HP-hr
            - CO ≤ 2.6 g/HP-hr
            - VOC ≤ 0.15 g/HP-hr
    - AS-17 – Fire Pump Engine #3 (West Pump House)
        - Update from 755 HP in the as-permitted configuration to 510 HP in the as-built configuration

[37] 40 CFR Part 60 Subpart IIII

        - Previously subject to the following emission limitations at 755 HP rating
            - NMHC + NO_X ≤ 4.8 g/HP-hr
            - CO ≤ 2.6 g/HP-hr
            - VOC ≤ 0.15 g/HP-hr
        - Now subject to the following emission limitations at 510 HP rating
            - NMHC + NO_X ≤ 3.0 g/HP-hr
            - CO ≤ 2.6 g/HP-hr
            - VOC ≤ 0.15 g/HP-hr
- Update the following engine rating changes not affecting the applicability of NSPS Subpart JJJJ or associated emissions limitations and requirements
    - AS-18 – Fire Pump Engine #4 (West Pump House)
        - Update from 422 HP in the as-permitted configuration to 510 HP in the as-built configuration

9.3.4 Paved Haul Roads (X022) PSD Changes

Novelis requests no changes to X022 because the general provisions of this permit are not affected by the as-built updates to the Paved Haul Road potential emission calculations.

9.3.5 Building Heating Systems PSD Changes

Novelis requests that a permit be added to include the desired annual operating limitation for combined natural gas usage from all units within the Building Heating Systems (AS-19) emission unit category. The following units will share the combined annual natural gas usage rate limitation of 486.7 MMscf/yr.

- AS-19a – Building Heating Systems (30 MAU @ 11.55 MMBtu/hr Each)
- AS-19b – Building Heating Systems (4 MAU @ 7.50 MMBtu/hr Each)
- AS-19c – Building Heating Systems (2 MAU @ 3.75 MMBtu/hr Each)
- AS-19d – Building Heating Systems (1 MAU @ 2.25 MMBtu/hr Each)
- AS-19e – Building Heating Systems (7 @ 0.175 MMBtu/hr Each)
- AS-19f – Building Heating Systems (12 @ 0.150 MMBtu/hr Each)
- AS-19g – Building Heating Systems (6 @ 0.105 MMBtu/hr Each)
- AS-19h – Building Heating Systems (4 @ 0.045 MMBtu/hr Each)

9.4 BACT Determination

In the original application for the Bay Minette facility, certain equipment that would be considered insignificant activities because they are small sources that are otherwise subject to generally applicable requirements, were deemed not technically feasible for BACT considerations because their emissions are not captured in a hood or duct for subsequent measurement using EPA Reference Test Methods. The following types of units were considered insignificant sources in the original application:

- Small interior natural gas combustion sources (i.e., CFF/DBF/Trough Heaters)
- Small Building Heating Systems (i.e., <5 MMBtu/hr insignificant activity threshold)
- Melting and Casting Area Fugitive VOC emissions
- Small storage vessels for Hot Rolling, Cold Rolling, and Coil Finishing
- Diesel fuel storage
- Lime Silos

In the original permits (X001-X022) issued by ADEM on February 3, 2023, BACT limits for these sources were not established. In cases where emissions cannot be measured, work practice standards can be

established as BACT in lieu of emission limits. Such work practice standards will be mandated through Novelis' proposed "general duty" requirement to "maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions."

The diesel fuel storage and refueling systems discussed in this section are small sources of emissions that have previously been determined to be insignificant as noted in the list above, and therefore, further BACT consideration is not needed and no additional compliance requirements are warranted.

For the paved haul road emissions, although not technically a listed insignificant activity, a numerical BACT limit should not apply to these emissions as confirmed through the original permitting. Rather, Novelis will maintain roadways in a manner to minimize emissions and will comply with the applicable Fugitive Dust Plan established for the Bay Minette facility as BACT level work practice standards in lieu of any numerical BACT limits.

The hot water boilers are being removed as part of the as-built configuration updates. Therefore, Novelis requests that the permit (X019) for these be removed along with the associated BACT limits.

For the cooling towers and the emergency engines, the changes proposed for the as-built configuration should not impact applicability of the formerly selected BACT limits. Novelis will continue to comply with applicable NSPS Subpart IIII/JJJJ limits for the emergency engines, and these limits will serve as BACT. Additionally, for the cooling towers, Novelis will continue to comply with the requirement to utilize drift eliminators with 0.001% drift of recirculated water as established in the X020 permit.

The smaller Building Heating Systems with maximum hourly heat input rates below the insignificant activity threshold can generally qualify for more streamlined consideration in the BACT determination as was the case for the as-permitted configuration of this emission unit category. However, as noted in the above list, a new category of larger Building Heating Systems with maximum hourly heat input rates falling above the insignificant activity threshold have been added to the as-built configuration which warrants a full BACT evaluation for the larger Building Heating System category (AS-19a and AS-19b). The following sections describe the BACT evaluation determination for these larger Building Heating System.

9.4.1 Building Heating System (AS-19a and AS-19b) BACT Evaluation Updates

Where the term Building Heating System is used within this BACT evaluation section, the term refers to only the larger Building Heating System category units (AS-19a and AS-19b). The smaller units that fall under the insignificance category are not considered for this analysis.

9.4.1.1 PM/ PM_{10}/$PM_{2.5}$ BACT Analysis for the Building Heating Systems

PM emissions from the large burners associated with the Building Heating System are generated by natural gas combustion.

9.4.1.1.1 Step 1 – Available PM/ PM_{10}/$PM_{2.5}$ Control Technologies for the Building Heating Systems

There are no NSPS or NESHAPs that can be used to establish a floor for PM emission rates from these Building Heating Systems. Based on a review of technical literature and past control technology determinations, generally available technologies and practices which could be potentially applied to control PM emissions from the Building Heating System are listed below (i.e., similar PM/PM_{10}/$PM_{2.5}$ control option

list as presented for the Sow Dryers in Section 6.1.6 of the original PSD application submitted in final form on November 2022):

- Fabric Filter (Baghouse)
- Electrostatic Precipitator (ESP)
- Wet Scrubber
- Cyclone
- Good Design and Operating Practices

9.4.1.1.2 Step 2 – Technically Feasible PM/ PM_{10}/$PM_{2.5}$ Control Technologies for the Building Heating Systems

The technical feasibility of each of the control technologies for the Building Heating Systems is described below.

Fabric Filter (Baghouse) for the Building Heating System

A fabric filter removes particulate matter from exhaust stream by passing it through tightly woven or felted fabrics in the form of sheets, cartridges, or bags. Baghouses are the most common type of fabric filters, consisting of several filters, typically configured in long, vertically suspended sock-like configurations. Particulate laden gas enters from one side, often from the outside of the bag, passing through the filter media and forming a particulate cake. The cake is removed by shaking or pulsing the fabric, which loosens the cake from the filter, allowing it to fall into a bin at the bottom of the baghouse. The air cleaning process stops once the pressure drop across the filter reaches an economically unacceptable level. Typically, the trade-off to frequent cleaning and maintaining lower pressure drops is the wear and tear on the bags produced in the cleaning process.[38] Typically, inlet loading of 0.5 to 10 gr/ft^3 and gas temperatures up to 260°C (500°F) can be accommodated routinely in a baghouse.[39] The fabric filters have relatively high maintenance requirements (for example, periodic bag replacement), and elevated temperatures above the designed temperature can shorten the fabric life. Additionally, a baghouse/fabric filter cannot be operated in moist environments where the condensation of moisture could cause the filter to be plugged, reducing efficiency. The collection efficiency of a baghouse depends on the particle and fabric characteristics, gas filtration velocity, and cleaning mechanism. Under the proper operating conditions, a baghouse can generally achieve approximately 99-99.9% reduction efficiency for PM emissions.[40]

Depending on the need, baghouses are available as standard units from the factory, or custom baghouses designed for specific applications. Standard baghouses can typically handle 100 to 100,000 scfm; while custom baghouses are generally larger, ranging from 100,000 to over 1,000,000 scfm.[41]

The air flow and temperature stream characteristics from the larger MAUs in the Building Heating System are in range for using fabric filters as the maximum airflow of the individual units range from 90,000 to 150,000 cfm with temperatures of 55°F to 100°F. However, the inlet loading concentrations are orders of magnitude lower than the filter design inlet concentration range of 0.5 to 10 gr/ft^3. Additionally, the combustion reactions will produce moisture which can clog the fabric filter and can lead to increased energy

[38] Kitto, J.B. *Air Pollution Control for Industrial Boiler Systems.* Barberton, OH: Babcock & Wilcox. November 1996. https://www.researchgate.net/publication/319689887_Air_Pollution_Control_for_Industrial_Boilers

[39] EPA, Air Pollution Control Technology Fact Sheet: Fabric Filter – Pulse-Jet Cleaned Type. EPA-452/F-03-025.

[40] *Ibid.*

[41] *Ibid.*

costs, shortened filter life, system underperformance, and unplanned operation disruptions. Also, as the heated air produced by the MAUs is mixed with the combustion gases, the heated air could not be effectively treated and then discharged into the buildings without significant heat transfer impacts which would be detrimental to the design and operating features of the MAUs. Furthermore, the RBLC search results did not identify any instances of a baghouse being used to control PM emissions from a similar source. Therefore, this technology is considered to be technically infeasible for the Building Heating Systems at the Bay Minette site, and it is not addressed in the remaining steps of the BACT evaluation.

Electrostatic Precipitator for the Building Heating System

An ESP is a particulate control device that removes particles from an air stream by electrically charging the particles and then passing them through a force field that causes them to migrate to an oppositely charged collector plate or wall. The removal of particles from the collector surface depends on the type of the ESP. An ESP can be designed for either dry or wet applications. In dry ESPs, the collector plates are knocked (rapped), and the accumulated particles fall into a collection hopper at the bottom of the ESP. In case of wet ESPs, the collector plates are washed by a stream of liquid, usually water, which goes into a drainage system instead of hoppers. The ESPs are further categorized into wire-plate type ESPs and wire-pipe type ESPs. In wire-plate type ESPs, the exhaust gas flows horizontally, perpendicular to the metal sheets placed vertically, while in wire-pipe type ESPs, the flow is horizontal through conductive tubes.

The collection efficiency of an ESP depends on the particle diameter, electrical field strength, gas flow rate, and plate dimensions. Generally, all types of ESPs can achieve approximately 99 to 99.9% reduction efficiency for PM emissions. However, the air flow and the inlet pollutant loading varies considerably between wire-plate type and wire-pipe type ESPs. A typical wire-plate type ESPs can handle approximately 100,000 to 500,000 scfm, of gas flow and inlet loading concentrations between 1 to 50 gr/ft^3.[42] Wire-pipe type ESPs are only handle up to 100,000 scfm of gas flow and inlet loading concentrations between 0.5 to 5 gr/ft^3.[43] In addition, the dry type ESPs provide much more operational flexibility because they can handle high temperatures of up to 700°C (1,300°F)[44] while wet type ESPs can only operate at temperatures lower than 90°C (190°F)[45]. Dry ESPs are not designed to collect wet or sticky PM, such as condensable particles. Condensable matter will clog the ESP, stay attached to the plates, and possibly short out the unit.

ESPs are sensitive to changes in gas stream characteristics such as flow rates, temperature, particulate and gas composition and particulate loadings. Additionally, the construction of ESPs requires a relatively large footprint to achieve the low gas velocities needed for efficient PM collection.[46]

The use of a dry ESP is technically infeasible for the MAU due to the moisture and condensable matter that would clog the ESP. Additionally, the inlet loading concentration is orders of magnitude smaller than dry and wet ESPs are capable of handling. Also, ESPs in general are not suited for use in processes which are highly variable because they are very sensitive to fluctuations in gas stream conditions (flow rates, temperatures, particulate and gas composition, and particulate loadings).[47] The MAUs will not be operated continuously

[42] EPA, Air Pollution Control Technology Fact Sheet: Dry Electrostatic Precipitator (ESP) – Wire-Plate Type. EPA-452/F-03-028.

[43] EPA, Air Pollution Control Technology Fact Sheet: Dry Electrostatic Precipitator (ESP) – Wire-Pipe Type. EPA-452/F-03-027.

[44] *Ibid.*

[45] EPA, Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) – Wire-Plate Type. EPA-452/F-03-030.

[46] EPA, Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) – Wire-Pipe Type. EPA-452/F-03-029.

[47] EPA, *Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) – Wire-Pipe Type.* EPA-452/F-03-030.

but rather on an as needed basis meaning combustion rates and air flows will vary, resulting in variable particulate flow to the ESP. Additionally, ESPs have a large space and power requirements, and the heated air would experience significant heat transfer if it were to be treated before being released into the building which would nullify the basic function of the MAU. Furthermore, the RBLC search did not identify any instances of an ESP being used on a similar source. Therefore, this technology is considered to be technically infeasible for the Building Heating Systems at the facility, and it is not addressed in the remaining steps of the BACT evaluation.

Wet Scrubbers for the Building Heating System

Wet scrubbers are particulate control devices that remove particles from an air stream through the utilization of a scrubbing liquid, typically water. The air stream is brought into contact with the scrubbing media through spray, condensation, forcing through a pool of liquid or other means. Types of wet scrubbing technologies include spray tower, venturi, and condensation scrubbers as well as others. All wet scrubbing systems contain mist eliminators or entrainment separators to remove the particulate entrained in the droplets.

Most wet scrubbing systems can achieve particulate collection efficiencies from 70% up to greater than 99%. The reduction of particulate concentrations is dependent on the type of scrubber system employed. Spray-tower scrubbers can achieve 70% up to greater than 99% particulate collection efficiencies depending on the application and air stream being controlled. However, for particulate control, they are not recommended due to the high liquid to gas ratios (greater than 22.4 gallons per thousand cubic feet) required. Venturi scrubbers can also achieve 70% up to greater than 99% efficiency and are generally on the higher end of this span for particulates with aerodynamic diameters between 0.5 to 5 µm. Inlet gas temperatures for venturi scrubbers usually range from 4 to 400°C (40 to 750°F), with typical gas flow rates for single-throat scrubbers ranging from 500 to 100,000 scfm.[48] Condensation scrubbers have collection efficiencies that can exceed greater than 99% and are typically intended for controlling particulate matter with an aerodynamic diameter of between 0.25 and 1.0 µm. Based on the small particulate size range, condensation scrubbers are best used to capture fine particulates that have passed through a primary particulate matter control device. The PM collection efficiencies of packed-bed/packed-tower scrubbers range from 70% to greater than 99%, depending on the application.[49] Inlet gas temperatures for packed-bed/packed-tower scrubbers usually range from 4 to 370°C (40 to 700°F), with typical gas flow rates ranging from 500 to 75,000 scfm. [50]

There are three main energy usage levels for wet scrubbers. A low energy wet scrubber is capable of efficiently removing particles greater than PM_5-PM_{10} and a medium energy scrubber is capable of removing particles greater than PM_{10}, so a high energy scrubber would be necessary to remove particles less than PM_{10} which constitute all combustion PM from the metal processing combustion units according to AP-42 Table 1.4-2.[51] The venturi wet scrubber is the most common high energy wet scrubber. While the air flow and temperature stream characteristics for the combustion sources are in range for using a venturi scrubber, the inlet loading concentrations are orders of magnitude lower than the scrubber design inlet concentration range of 0.1 to 50 gr/cf.[52] The use of a wet scrubber would not allow for any airflow to be

[48] EPA, Air Pollution Control Technology Fact Sheet: Venturi Scrubbers. EPA-452/F-03-017.

[49] EPA, Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber. EPA-452/F-03-015.

[50] EPA, Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber. EPA-452/F-03-015.

[51] https://www.epa.gov/air-emissions-monitoring-knowledge-base/monitoring-control-technique-wet-scrubber-particulate-0

[52] EPA, Air Pollution Control Technology Fact Sheet: Venturi Scrubber. EPA-452/F-03-017.

released into the building to be used for heat as intended. Additionally, the RBLC search results did not identify any instances of a wet scrubber being used to control PM emissions from a similar source. Therefore, this technology is considered to be technically infeasible for the Building Heating Systems at the Bay Minette site, and it is not addressed in the remaining steps of the BACT evaluation.

Cyclones for the Building Heating System

A cyclone uses the mechanism of inertial momentum to separate particles from the exhaust gas stream. It creates a double vortex inside its conical shaped chamber, which conveys centrifugal force on the inlet exhaust stream. The exhaust stream is then forced to move circularly down through the cyclone, while the particulate matter in the stream is pushed outwards to the cyclone walls by the centrifugal force of spiraling gas. The particles with large inertial momentum reach the cyclone walls and get collected. While this is effective for larger particles, smaller particles tend to be overtaken by the fluid drag force of the air stream and depart the cyclone with the exiting air stream. The particulate removal in cyclones can be improved by having more complex gas flow patterns. The control efficiency range for high energy single cyclones is 80-95% of PM, 60-95% for PM_{10} and 20-70% for $PM_{2.5}$ compared to 70-90% of PM, 30-90% for PM_{10} and 0-40% for $PM_{2.5}$ for a conventional cyclone. [53] The removal efficiencies and gas throughput of cyclone system can be further improved by operating several small cyclones in parallel. Such a multi-cyclone system results in control efficiencies in the range of 80-95% for particles greater than 5 microns in diameter (PM_5). Multi-cyclones in parallel can typically handle a higher flow rate when compared to a single cyclone unit, of approximately 106,000 standard cubic foot per minute (scfm). The allowable inlet gas temperature for a cyclone is limited by the type of construction material but can get as high as 540°C (1,000°F). Cyclones are generally used as precleaners for final control devices such as fabric filters/baghouses or ESPs due to the lower control efficiency on a cyclone and ability to handle higher inlet loading typically between 1 and 100 gr/ft^3.[54]

According to AP-42 Table 1.4-2, all particulate emissions from natural gas combustion are assumed to have a particle diameter of less than 1 micron. According to AP-42 Table B.2-3, the control efficiency of a single cyclone for PM between 0 and 2.5 microns is 10%. Additionally, the RBLC search results did not identify any instances of a cyclone system being used to control PM emissions from a similar source. Therefore, this technology is considered to be technically infeasible for the Building Heating Systems at the Bay Minette site, and it is not addressed in the remaining steps of the BACT evaluation.

Good Operating and Maintenance Practices for the Building Heating System

Good design and operating practices imply that the unit is operated within parameters that, without significant control technology, allow the equipment to operate as efficiently as possible. A properly operated unit will minimize the formation or enhance the capture of PM emissions. For combustion units, these considerations will involve good combustion operation practices to minimize the potential particulate emissions associated with incomplete combustion.

The good operating and maintenance practices represent a technically feasible control option for minimizing PM emissions from the combustion sources present in the Building Heating Systems. This method is addressed in the remaining steps of the BACT evaluation.

[53] EPA, Air Pollution Control Technology Fact Sheet: Cyclones. EPA-452/F-03-005.

[54] *Ibid.*

9.4.1.1.3 Step 3 – Effectiveness Ranking of PM/PM_{10}/$PM_{2.5}$ Control Technologies for the Building Heating Systems

The only remaining control option not eliminated based on technical feasibility concerns is good design and operating practices.

9.4.1.1.4 Step 4 – Economic, Environmental, and Energy Impacts of PM/PM_{10}/$PM_{2.5}$ Control Technologies for the Building Heating Systems

The remaining control option is good design and operating practices. There are no significant economic, environmental, or energy impacts from the listed control technology.

9.4.1.1.5 Step 5 – BACT Limitations Selection of PM/PM_{10}/$PM_{2.5}$ Control Technologies for the Building Heating Systems

Novelis proposes the implementation of good design and operating practices as BACT control for PM emissions from the Building Heating Systems. The burners associated with the Building Heating Systems will represent modern equipment design for achieving maximum process efficiency and will only combust natural gas. Heated air mixed with the exhaust from combustion will be directed through the vents and into the buildings as such all PM emissions will be defined as uncaptured or fugitive. No similar operations were identified in the RBLC or in the similar facility review with add-on PM control devices.

Compliance with the proposed particulate emissions as shown in Section 30 of **Appendix C** will be demonstrated by operating and maintaining the process units in accordance with the manufacturer's recommendations, instructions, and/or operating manual(s), with any modifications deemed necessary by Novelis. To reflect the limited seasonal use of the Building Heating Systems during the coldest timeframes of the year, daily average and annual average (12-month rolling) natural gas usage limitations for source-wide Building Heating System natural gas consumption are also being proposed as additional enforceable elements of the PSD review process. At the direction of ADEM, Novelis is also accepting an additional hourly natural gas usage limitation for the Building Heating Systems to support the daily and annual average limits initially proposed by ADEM. Refer to proposed natural gas usage limitations in Section 30 of **Appendix C,** and refer to **Section 9.4.1.2.5** for additional details on the approach for implementing these proposed Building Heating System natural gas usage limits.

9.4.1.2 NO_X BACT Analysis for the Building Heating Systems

NO_X emissions from the Building Heating Systems are generated by natural gas combustion.

9.4.1.2.1 Step 1 – Available NO_X Control Technologies for the Building Heating Systems

There are no NSPS or NESHAPs that can be used to establish a floor for NO_X emission rates from these Building Heating Systems. Based on a review of technical literature and past control technology determinations, generally available technologies and practices which could be potentially applied to control NO_X emissions from the Building Heating System are listed below (i.e., similar NO_X control option list as presented for the Sow Dryers in Section 7.2.3 of the original PSD application submitted in final form on November 2022):

- Good Combustion and Operating Practices (GCOP)
- Low NO_X Burners (LNB)
- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)

9.4.1.2.2 Step 2 – Technically Feasible NO_X Control Technologies for the Building Heating Systems

The technical feasibility of each of the control technologies for the Building Heating Systems is described below.

Good Combustion and Operating Practices

The formation of NO_X is minimized by proper combustion system design and operation. Generally, emissions are minimized when the firing temperature is kept at the lower end of the desired range and when the distribution of air at the air and fuel injection zones is controlled. Ideally, maintaining a low-oxygen condition near fuel injection points approaches an off-stoichiometric staged combustion process.

A certain amount of air is required to provide sufficient oxygen to burn all of the fuel. However, any excess air contributes to increased NO_X emissions in two ways: 1) Excess air effectively increases the amount of air that must be heated, resulting in decreased fuel efficiency and higher NO_X emissions, and 2) Excess air provides greater amounts of oxygen in the combustion zone that will lead to greater amounts of thermal NO_X formation. By minimizing the amount of air used in the combustion process while maintaining proper burner operation, the formation of NO_X can be reduced.

For the Building Heating Systems, good combustion and operating practices implemented to minimize NO_X formation are technically feasible.

Low NO_X Burners

Low NO_x Burners (LNB) control NO_X formation by carrying out the combustion in stages. These burners control the combustion staging at and within the burner rather than in the firebox. This control is achieved through design features that regulate the aerodynamic distribution and mixing of fuel and air. By staging the combustion process, thermal NO_X formation is reduced by lowering the peak flame temperature. In addition, fuel NO_X formation is reduced by lowering the amount of oxygen in the initial combustion zone. NO_X emission reductions of 40 to 85 percent (relative to uncontrolled emission levels) have been observed with low NO_X burners.[55]

For the Building Heating System, LNB are technically feasible. Specifically, the direct-fired, line-style burners used in the MAU implement an innovative two stage combustion system for NO_X and CO emissions minimization. The two-stage combustion system improves control of the flame process and meets and exceeds applicable design standards for LNB performance (e.g., ANSI Z83.4 and Z83.18).[56] [57] By having two separate flames within the burner combustion zone, the flame is more stable, shorter and cleaner, minimizing the emissions levels and allowing for higher temperature rise and higher tolerance to varying conditions as compared to single stage burner design when utilized in the Building Heating Systems.[58]

[55] U.S .EPA AP-42, Compilation of Air Pollutant Emissions Factors Section 1.4.4 (July 1988).

[56] ANSI Z83.4-2017/CSA 3.7-2017 - ANSI Z83.4-2017/CSA 3.7-2017 - Non-recirculating direct gas-fired heating and forced ventilation appliances for commercial and industrial application

[57] ANSI Z83.18-2017 - ANSI Z83.18-2017 - Recirculating direct gas-fired heating and forced ventilation appliances for commercial and industrial applications

[58] https://midcointernational.com/wp-content/uploads/2022/01/8474-83-M-HMA-2-2A.pdf

Selective Catalytic Reduction

SCR is a post-combustion gas treatment process in which ammonia (NH_3) is injected into the exhaust gas upstream of a catalyst bed. On the catalyst surface, ammonia and NO_X react to form elemental nitrogen and water. The primary chemical reactions can be expressed as follows:

$$4\ NH_3 + 4\ NO + O_2 \rightarrow 4\ N_2 + 6\ H_2O$$
$$4\ NH_3 + 2\ NO_2 + 2\ O_2 \rightarrow 3\ N_2 + 6\ H_2O$$

When operated within the optimum temperature range of 575 to 750°F, the reaction can result in removal efficiencies between 70 and 90%.[59] Operation outside the optimum temperature range can result in increased ammonia slip or increased NO_X emissions. SCR units have the ability to function effectively under fluctuating temperature conditions (usually ± 50°F), although fluctuation in exhaust gas temperature reduces removal efficiency slightly by disturbing the kinetics (speed) of the NO_X-removal reaction.

As mentioned, the SCR process requires temperatures of 480 to 800°F to achieve high conversion rates for NO_X. At exhaust temperatures of around 55 to 100°F depending on the operating mode, the exhaust gas temperatures from the Building Heating Systems fall outside of this range. Without additional available heat input capacity from the process stream (i.e., high levels of CO, combustible organic compounds, etc.), a preheating system will require firing significant amounts of natural gas to achieve the temperatures necessary for proper operation of the SCR. As a result, the natural gas-fired preheating system by itself will generate the same pollutants as the burners. Additionally, SCR is feasible as an add-on control device on gas-fired combustion units greater than 50 MMBtu/hr.[60] However, the individual combustion systems on each of the larger Building Heating Systems are rated from 7.50 to 11.55 MMBtu/hr which is well below the minimum size requirement for implementing SCR. Furthermore, the add-on nature of the SCR control technology would defeat the intended purpose of providing heated air to the production buildings. Therefore, this technology is considered to be technically infeasible for the Building Heating Systems at the Bay Minette site, and it is not addressed in the remaining steps of the BACT evaluation.

Selective Non-Catalytic Reduction

SNCR is a post-combustion NO_X control technology based on the reaction of urea or ammonia with NO_X. In the SNCR chemical reaction, urea [$CO(NH_2)_2$] or ammonia is injected into the combustion gas path to reduce the NO_X to nitrogen and water. The overall reaction schemes for both urea and ammonia systems can be expressed as follows:

$$CO(NH_2)_2 + 2\ NO + ½\ O_2 \rightarrow 2\ N_2 + CO_2 + 2\ H_2O$$
$$4\ NH_3 + 6NO \rightarrow 5\ N_2 + 6\ H_2O$$

Typical removal efficiencies for SNCR range from 30 to 65%.[61] An important consideration for implementing SNCR is the operating temperature range. The optimum temperature range is approximately 1,600 to

[59] EPA, Office of Air Quality Planning and Standards. *OAQPS Control Cost Manual Section 4-2 Chapter 2, 6th edition*. EPA 452/B-02-001. Research Triangle Park, NC. January 2002.

[60] *Ibid.*

[61] EPA, Office of Air Quality Planning and Standards *OAQPS Control Cost Manual Section 4-2 Chapter 1, 6th edition*. EPA 452/B-02-001. Research Triangle Park, NC. January 2002.

2,000°F.[62] Operation at temperatures below this range results in ammonia slip. Operation above this range results in oxidation of ammonia, forming additional NO_X.

Similarly to the SCR determination, the SNCR process requires temperatures far greater than the exhaust gas temperatures from the Building Heating Systems. The exhaust gas from Building Heating Systems would need to be preheated by more than 1,500°F in order to achieve effective control through SNCR. Additionally, SNCR is feasible as an add-on control device on gas-fired combustion units greater than SNCR is feasible on combustion units ranging in size from 50 to 6,000 MMBtu/hr. Following the same rationale presented for the SCR category, the previous arguments regarding additional NO_X emissions from the preheating process rise to the level of eliminating SNCR from subsequent steps in the BACT analysis solely on the basis of technical infeasibility for the Building Heating Systems. Additionally, the SNCR systems would negate the intended effect of providing appropriately heated air into the production buildings. Therefore, this technology is considered to be technically infeasible for the Building Heating Systems at the Bay Minette site, and it is not addressed in the remaining steps of the BACT evaluation.

9.4.1.2.3 Step 3 – Effectiveness Ranking of NO_X Control Technologies for the Building Heating Systems

All of the Step 1 control technologies that are considered available and technically feasible for the Building Heating Systems are ranked in order of control efficiency in **Table 9-1**.

Table 9-1. Remaining Control Technologies Ranked by Effectiveness for NO_X for the Building Heating Systems

Emission Unit	Control Technology	Control Efficiency
Building Heating System (AS-19a and AS-19b)	LNB	40-85%
	GCOP	Undefined

9.4.1.2.4 Step 4 – Economic, Environmental, and Energy Impacts of NO_X Control Technologies for the Building Heating Systems

The remaining control options are LNB and GCOP. There are no significant economic, environmental, or energy impacts from the listed control technology.

9.4.1.2.5 Step 5 – BACT Limitations Selection of NO_X Control Technologies for the Building Heating Systems

NO_X emissions from the proposed Building Heating Systems are due solely to natural gas combustion. The associated burners will be LNBs to achieve compliance. As these emissions are not routed through a stack or vent, source testing to demonstrate compliance with a numerical emission limit based BACT determination is not technically feasible. The proposed NO_X emissions as shown in Section 30 of **Appendix C** are based on AP-42 emission factors.[63] The combined hourly and annual potential NO_X emissions for the Building Heating Systems (AS-19a through AS-19h) are 39.01 lb NO_X/hr (unconstrained/unlimited based on maximum hourly heat input rating) and 24.33 tpy NO_X, respectively (constrained by proposed annual natural gas usage

[62] EPA, Clean Air Technology Center. Nitrogen Oxides (NOX), *Why and How They Are Controlled*. Research Triangle Park, North Carolina. p. 18, EPA-456/F-99-006R, November 1999.

[63] EPA, "AP-42 Chapter 1.4 -- Natural Gas Combustion", (July 1998).

limitation that considers seasonal/limited use for production building heating). To ensure that the annual potential emissions presented in Section 30 of **Appendix C** are achieved in practice, Novelis proposes a source-wide Building Heating System annual natural gas usage operating limitation. A separate daily average natural gas usage limitation for the Building Heating Systems is proposed to support the PSD air quality analysis. Additionally, an hourly natural gas usage rate limitation is being accepted according to ADEM's recommendations. Finally, the Building Heating System will be operated and maintained in accordance with the manufacturer's recommendations, instructions, and/or operating manual(s), with any modifications deemed necessary by the facility.

For the Building Heating System natural gas usage limitation compliance tracking, natural gas flow meters are not included in the design for each of the Building Heating System units nor are there gas flow meters on common headers that would be able to measure individual or groupings of the Building Heating Systems due to number and extent of these Building Heating Systems throughout the entire building design. Rather, the combined Building Heating System natural gas usage can be expected to be reasonably calculated based on the difference of the combined primary combustion unit's natural gas usage from the combined overall main natural gas supply to the facility. The primary combustion units at the facility are either individually equipped with natural gas flow meter(s) or are equipped with flow meter(s) serving a primary combustion unit grouping. Similarly, the main natural gas supply stations operated by the local distribution company (a.k.a., utility) are equipped with fuel flow meters. Using the "by subtraction" calculation technique, the natural gas usage associated with the Building Heating System can be reasonably estimated once the natural gas usage tracking system is fully implemented and maintaining electronic records on at least a daily and hourly basis.

If the natural gas flow meter-based tracking system is not available or is otherwise determined to not be preferred or as easily implemented or reliable as anticipated, Novelis would like to retain the flexibility to estimate natural gas usage of the Building Heating Systems using other monitoring techniques. Specifically, the Building Heating System supplier has indicated availability of a sensor that can provide data on the position of the main natural gas supply valve to each of the larger MAU-type Building Heating Systems. This natural gas supply valve position sensor will allow for an estimation of the natural gas usage from the individual MAU-type Building Heating System in support of or in place of the natural gas flow meter-based tracking option. Under this flexible framework, Novelis can reasonably obtain measurements or estimates for the hourly, daily, and annual natural gas usage from the Building Heating Systems on a combined basis for comparison against the proposed hourly, daily, and annual operating limitations.

9.4.1.3 CO BACT Analysis for the Building Heating Systems

CO emissions from the Building Heating System are generated by natural gas combustion.

9.4.1.3.1 Step 1 – Available CO Control Technologies for the Building Heating Systems

There are no NSPS or NESHAPs that can be used to establish a floor for CO emission rates from the Building Heating Systems.

Based on a review of technical literature and past control technology determinations, generally available technologies and practices which could be potentially applied to control CO emissions from the Building Heating Systems are listed below (i.e., similar CO control option list as presented for the Sow Dryers in Section 8.1.3 of the original PSD application submitted in final form on November 2022):

- GCOP
- Thermal Oxidation/Afterburner

- Catalytic Oxidation (CatOx)

9.4.1.3.2 Step 2 – Technically Feasible CO Control Technologies for the Building Heating Systems

The technical feasibility of each of the control technologies for the Building Heating Systems is described below.

Good Combustion and Operating Practices

The formation of CO is minimized by proper combustion system design and operation. CO emissions are minimized by combustion practices that promote high combustion temperatures, long residence times at those temperatures, and turbulent mixing of fuel and combustion air. For the Building Heating Systems, good combustion and operating practices implemented to minimize CO formation are technically feasible.

Thermal Oxidation

Thermal oxidizers, also known as thermal incinerators or afterburners, are combustion devices that control CO emissions by converting them to carbon dioxide (CO_2) and water. Important design factors include temperature (a temperature high enough to ignite the organic constituents in the waste stream), residence time (sufficient time for the combustion reaction to occur), and turbulence or mixing of the combustion air with the waste gas. With respect to potential CO emissions control from a non-catalytic thermal oxidation system, the combustion processes occurring in the oxidizer are not expected to be any more efficient at minimizing CO formation than the burner systems in the Building Heating Systems when operated in accordance with GCOP. Therefore, thermal oxidation is not available as an add-on control device for CO emissions reduction because it would not provide any additional CO removal beyond what is already achieved through proper operation of the burners. As the burners individually are relatively small natural gas-fired sources, post-combustion controls, such as thermal oxidizers and CatOx are technically infeasible and impractical due to the relatively small quantities of CO present in the exhaust gas and the design for the exhaust gas to be released with the heated air into the buildings. Furthermore, thermal oxidation would increase combustion emissions and require additional fuel use (wasted energy). Therefore, thermal oxidation is considered to be technically infeasible and is not addressed in the remaining steps of the BACT evaluation.

Catalytic Oxidation

CatOx operate very similar to thermal oxidizers, with the primary difference that the gas, after passing through the flame area, passes through a catalyst bed. The catalyst facilitates the overall combustion reaction by increasing the reaction rate, enabling conversion at lower reaction temperatures than in thermal oxidizer units. The chemical reaction (combustion) between the oxygen in the gas stream and the gaseous pollutants takes place at the catalyst surface. The catalyst is typically a porous noble metal material. The catalytic oxidation process for CO control is very temperature sensitive; exhaust temperatures that are too high may damage the catalyst, while exhaust temperatures that are too low will reduce reduction efficiency. CO destruction efficiency for a CatOx is dependent upon exhaust composition and CO concentrations, operating temperature, oxygen concentration, catalyst characteristics, and space velocity (the volumetric flow rate of gas entering the catalyst bed chamber divided by the volume of the catalyst bed. Similarly to thermal oxidation, CatOx is technically infeasible and impractical due to the relatively small quantities of CO present in the exhaust gas and the direct fired design of the Building Heating Systems. Furthermore, thermal oxidation would increase combustion emissions and require additional fuel use (wasted energy). Therefore, CatOx is considered to be technically infeasible and is not addressed in the remaining steps of the BACT evaluation.

9.4.1.3.3 Step 3 – Effectiveness Ranking of CO Control Technologies for the Building Heating Systems

The only remaining control option not eliminated based on technical feasibility concerns is GCOP.

9.4.1.3.4 Step 4 – Economic, Environmental, and Energy Impacts of CO Control Technologies for the Building Heating Systems

The remaining control option is GCOP. There are no significant economic, environmental, or energy impacts from the listed control technology.

9.4.1.3.5 Step 5 – BACT Limitations Selection of CO Control Technologies for the Building Heating Systems

The proposed Building Heating Systems will utilize good combustion and operating practices as the CO control technology. Note that CO emissions from the Building Heating Systems are due solely to natural gas combustion and are fugitive in nature. Numerical CO emission limits for the Building Heating Systems are technically infeasible for the same reasons noted for NO_X emissions. The same daily and annual natural gas usage limitations and associated monitoring discussed in the NO_X BACT determination will equally serve in demonstrating compliance with the Building Heating System CO emissions basis. Additionally, an hourly natural gas usage rate limitation is being accepted according to ADEM's recommendations. Finally, the Building Heating System will be operated and maintained in accordance with the manufacturer's recommendations, instructions, and/or operating manual(s), with any modifications deemed necessary by the facility.

9.4.1.4 VOC BACT Analysis for the Building Heating Systems

VOC emissions from the Building Heating System are generated by natural gas combustion.

9.4.1.4.1 Step 1 – Available VOC Control Technologies for the Building Heating Systems

There are no NSPS or NESHAPs that can be used to establish a floor for VOC emission rates from the Building Heating Systems.

Based on a review of technical literature and past control technology determinations, generally available technologies and practices which could be potentially applied to control VOC emissions from the Building Heating Systems are listed below (i.e., similar VOC control option list as presented for the Sow Dryers in Section 9.1.3 of the original PSD application submitted in final form on November 2022):

- GCOP
- Thermal Oxidation/Afterburner
- CatOx

9.4.1.4.2 Step 2 – Technically Feasible VOC Control Technologies for the Building Heating Systems

The technical feasibility of each of the control technologies for the Building Heating Systems is described below.

Good Combustion and Operating Practices

The formation of VOC can be minimized like the formation of CO as described in **Section 9.4.1.3.2**. For the Building Heating Systems, good combustion and operating practices implemented to minimize VOC formation are technically feasible.

Thermal Oxidation

Thermal oxidizers are technically infeasible for the Building Heating Systems for the same reasons that it is technically infeasible for CO minimization, as described in **Section 9.4.1.3.2**. Therefore, thermal oxidation is considered to be technically infeasible due to the small quantities of VOC in the gas and the additional VOC emissions produced by the thermal oxidizers. As such thermal oxidation is not addressed in the remaining steps of the BACT evaluation.

Catalytic Oxidation

CatOx are technically infeasible for the Building Heating Systems for the same reasons that it is technically infeasible for CO minimization, as described in **Section 9.4.1.3.2**. CatOx is considered to be technically infeasible due to the small quantities of VOC in the gas and the additional VOC emissions produced by the thermal oxidizers. As such thermal oxidation is not addressed in the remaining steps of the BACT evaluation.

9.4.1.4.3 Step 3 – Effectiveness Ranking of VOC Control Technologies for the Building Heating Systems

The only remaining control option not eliminated based on technical feasibility concerns is GCOP.

9.4.1.4.4 Step 4 – Economic, Environmental, and Energy Impacts of VOC Control Technologies for the Building Heating Systems

The remaining control option is GCOP. There are no significant economic, environmental, or energy impacts from the listed control technology.

9.4.1.4.5 Step 5 – BACT Limitations Selection of VOC Control Technologies for the Building Heating Systems

The proposed Building Heating Systems will utilize good combustion and operating practices as the VOC control technology. Note that VOC emissions from the Building Heating System are due solely to natural gas combustion and are fugitive in nature. Numerical VOC emission limits for the Building Heating Systems are technically infeasible for the same reasons noted for NO_X and CO emissions. The same daily and annual natural gas usage limitations and associated monitoring discussed in the NO_X BACT determination will equally serve in demonstrating compliance with the Building Heating System VOC emissions basis. Additionally, an hourly natural gas usage rate limitation is being accepted according to ADEM's recommendations. Finally, the Building Heating System will be operated and maintained in accordance with the manufacturer's recommendations, instructions, and/or operating manual(s), with any modifications deemed necessary by the facility.

9.4.1.5 GHG BACT Analysis for the Building Heating Systems

GHG emissions from the Building Heating System are generated by natural gas combustion.

9.4.1.5.1 Step 1 – Available GHG Control Technologies for the Building Heating Systems

There are no NSPS or NESHAPs that can be used to establish a floor for GHG emission rates from the Building Heating Systems.

Based on a review of technical literature and past control technology determinations, generally available technologies and practices which could be potentially applied to control GHG emissions from the Building Heating Systems are listed below (i.e., the same GHG control option list as presented for external combustion units in Section 10.1.1 of the initial PSD application submitted in final form on November 2022):

- Carbon Capture and Sequestration
- Optimum Combustion Efficiency
- Fuel Selection
- Good Design and Operating Practices

9.4.1.5.2 Step 2 – Technically Feasible GHG Control Technologies for the Building Heating Systems

The technical feasibility of each of the control technologies for the Building Heating Systems is described below.

Carbon Capture and Storage

An effective carbon, capture, and storage (CCS) system would require three elements:

- Separation technology for the CO_2 exhaust stream (i.e., "carbon capture" technology),
- Transportation of CO_2 to a storage site, and
- A viable location for long-term storage of CO_2.

These three elements work in series. Consequently, in order to execute a CCS program as BACT, all three elements must be "available".

CO_2 Capture

CCS involves post-combustion capture of the CO_2 from the emission units and sequestration of the CO_2 in some fashion. Carbon capture is an established process in some industry sectors, although not in the secondary aluminum and aluminum rolling mill sectors. In theory, carbon capture could be accomplished with low pressure scrubbing of CO_2 from the exhaust stream with either solvents (e.g., amines and ammonia), solid sorbents, or membranes. Solvents have been used to-date on a commercial (slip stream) scale. Carbon capture via membranes reached the large pilot testing phase in late 2024, but membrane technology is still not commercially available for a full size industrial producer.[64] Solid sorbents have been demonstrated on commercial scale operations for a cement plant; however, solid sorbent technologies would not be available for processes similar to the Building Heating Systems.[65]

Additionally, the add-on nature of carbon capture technologies would fundamentally change the Building Heating Systems design as the combustion produced emissions are mixed with the heated air and released into the building. If a CO_2 capture unit were to be installed, the delivery of heated air to the buildings would be compromised. Nonetheless, Novelis has continued the technical feasibility analysis of CCS by reviewing the transport and storage aspects for the sake of completeness and to demonstrate that each step in the

[64] Journal of Membrane Science. (2026, January). Volume 738 Part B. Carbon Capture with Membranes: An Opportunity Revisited. Retrieved from *https://www.sciencedirect.com/science/article/abs/pii/S0376738825011421?via%3Dihub*.

[65] Sustainability Atlas. (2026, February). Case Study: Carbon Capture Materials (Sorbents, Membranes) — A Leading Company's Implementation and Lessons Learned. Retrieved from *https://sustainableatlas.org/post/case-study-carbon-capture-materials-sorbents-membranes-a-leading-companys-implem-1902*.

CCS process is technically infeasible for the Building Heating Systems (and all other external combustion units at the Bay Minette facility).

CO_2 Transport

CO_2 must be compressed from near-atmospheric pressure to pipeline pressure (around 2,000 psia) prior to transportation to an appropriate sequestration site. The compression of CO_2 requires a large auxiliary power load, resulting in the use of additional fuel (and additional CO_2 emissions) to generate this needed electricity.[66]

CO_2 that has been captured and compressed is subsequently transported to the site designated for long-term geologic storage or use in enhanced oil recovery (EOR). Pipelines are expected to be the most economical and efficient method of transporting CO_2 for commercial purposes. Once constructed, pipelines reduce uncertainty associated with logistics, fuel costs, and reliance on other infrastructure that could increase the cost of CO_2 transportation. The history of transporting CO_2 via pipelines in the United States spans over 40 years.

As of 2024, there were approximately 32 liquid CO_2 pipeline operators under USDOT regulatory authority in the United States according to the Pipeline and Hazardous Materials Safety Administration (PHMSA).[67] This distribution network consists of approximately 5,345 miles of pipe transporting supercritical fluid CO_2 and a significantly smaller amount (~60 miles) of gas CO_2 pipelines.[68] Currently there are no CO_2 pipelines in the vicinity of the Bay Minette site.[69] A 2021 report delivered to Congress by the Council of Environmental Quality on CCS identifies priorities including the establishment of an interstate CO_2 pipeline network modeled by the Princeton Net-Zero America study covering portions of the Central States and Midwest regions, but there are no proposed routes in Alabama.[70] Therefore, CO_2 transportation infrastructure is not currently available for the Novelis Bay Minette site nor have any future plans for adding CO_2 transportation been proposed by a governmental or private sector entity within the initial operating period of the Bay Minette site.

CO_2 Storage

CO_2 storage refers to the process of injecting CO_2 into subsurface formations for long-term sequestration.[71] CO_2 storage is currently happening across the U.S. and around the world. Large, commercial-scale projects, like the Sleipner CO_2 Storage Site in Norway, the Weyburn-Midale CO_2 Project in Canada, and the In Salah project in Algeria, have been injecting CO_2 for years. Each of these projects stores more than 1 million tons

[66] EPA. (2010, August). Report of the Interagency Task Force on Carbon Capture and Storage. Retrieved from *https://energy.gov/sites/prod/files/2013/04/f0/es_ccstf_2010_0.pdf*.

[67] USDOT PHMSA. (2024). 2010+ Pipeline Miles and Facilities Analytics. Retrieved from *https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-mileage-and-facilities*.

[68] Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration (2021, June). Retrieved from *https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf*

[69] U.S. DOE. (2015, April). A Review of the CO_2 Pipeline Infrastructure in the U.S. Retrieved from *https://energy.gov/sites/prod/files/2015/04/f22/QER%20Analysis%20-%20A%20Review%20of%20the%20CO2%20Pipeline%20Infrastructure%20in%20the%20U.S_0.pdf*.

[70] Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration (2021, June). Retrieved from https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf

[71] EPA. (2010, August). Report of the Interagency Task Force on Carbon Capture and Storage. Retrieved from *https://energy.gov/sites/prod/files/2013/04/f0/es_ccstf_2010_0.pdf*.

of CO_2 per year.[72] Domestically, the US DOE has successfully completed two industrial "Major Demonstration" projects:[73]

The Archer Daniels Midland project involves CO_2 capture and sequestration at a biofuels production plant in Decatur, Illinois. This project started commercial operations in April 2017, received an EPA Class VI UIC injection well permit for CO_2 storage, and, as of March 2021, successfully captured and stored over 2 million metric tons of CO_2.

The Air Products project started commercial operations in Port Arthur, Texas, hydrogen production facility in March 2013. As of March 2021, the Air Products project has successfully captured nearly 7 million metric tons of CO_2 that is used for EOR.

CO_2 may also be injected into the ground for EOR. Underground CO_2 injection has been used successfully to boost production efficiency of oil and gas wells by re-pressurizing the reservoir, and in the case of oil, by increasing mobility.[74]

According to the Clean Air Task Force (CATF) US Carbon Capture Activity and Project Map, there are currently four storage projects in development located within the state lines of Alabama.[75] Of those four projects, the closest two projects are located within Mobile County, one in Bucks, AL and the other in Mobile, AL. The closest proposed project is the Tenaska Longleaf CCS Hub in Bucks, AL; the current earliest anticipated timeline will not begin storage activities until 2029 presuming on time issuance of permits.[76] Additionally, the project is mainly intended to collect CO_2 gases from producers in northern Mobile County along the Mobile River which is about 20-30 miles west of the Bay Minette facility through the Upper Delta Wildlife Management Area.[77] Less is known about the timeline for the other nearby project, the Orion Storage Facility proposed by Denbury Carbon Solutions with Natural Resource Partners in 2022, but the proposed facility is located further west of the Longleaf CCS Hub and is approximately 30-40 miles away from the Bay Minette facility.[78]

Both the Longleaf CCS Hub and the Orion Storage Facility are still in the development stages and will not be ready to receive CO_2 before the Bay Minette facility begins operations. Additionally, although Alabama state legislation has passed establishing a framework for underground carbon storage, the EPA holds primacy for Class VI (dedicated to geologic storage) well permitting.[79] As such, permitting efforts for these projects will and are likely to experience a bottleneck with EPA estimating a timeline of two and a half years for a project

[72] U.S. Department of Energy National Energy Technology Laboratory. (n.d.). Carbon Storage FAQ Information Portal: Carbon Storage. Retrieved from https://netl.doe.gov/carbon-management/carbon-storage/faqs/carbon-storage-faqs

[73] Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration (2021, June). Retrieved from https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf

[74] *Ibid.*

[75] Clean Air Task Force. US Carbon Capture Activity and Project Map. Retrieved from *https://www.catf.us/ccsmapus/*.

[76] Tenaska. Longleaf CCS Hub Carbon Capture and Storage Development in Alabama Fact Sheet. Retrieved from *https://longleafccs.com/wp-content/uploads/2025/09/update-fact-sheet.pdf*.

[77] Ross, T and Riestenberg, D. (2024, August). Longleaf CCS Hub. Retrieved from *https://netl.doe.gov/sites/default/files/netl-file/24CM/24CM_CTS1_8_Riestenberg.pdf*.

[78] Carbon Capture Journal. (2022, February). Denbury and Natural Resource Partners to Evaluate Alabama CO2 Storage. Retrieved from *https://www.carboncapturejournal.com/ViewNews.aspx?NewsID=4956*.

[79] AL Code §9-17-160 to §9-17-166. Passed in 2024.

to be approved. As of June 2025, the EPA currently had 175 applications under review for Class VI permits.[80] Furthermore, extensive characterization studies would be needed to determine the extent and storage potential for CO_2 in geological formations near the proposed facility. These studies would take several years of investigation, including drilling characterization wells, and would likely require small-scale injection testing before determining their full-scale viability. As such, there are no potential sites where CO_2 could be sequestered in the vicinity of the facility location.

According to the 2021 report to Congress, the nearest storage sites (i.e., EOR fields with potential CO_2 demand and potential saline injection areas) would be in Southern Mississippi more than 60 miles from the Novelis Bay Minette site.[81] Since there are no potential sites where CO_2 could be used for EOR in the vicinity of the Novelis Bay Minette site, and there are currently no CO_2 pipelines which could transport compressed CO_2 to a region of the country (e.g., South Alabama) where it could be used for EOR, Novelis' evaluation of CCS technology assumes that the construction of a pipeline for the transport of CO_2 to a region where it could be used for EOR would be necessary.

Additionally, small and large-scale CO_2 storage projects such as those identified by National Energy Technology Laboratory have not yet reached the licensing and commercial stage of development.[82] Indeed, these projects are being undertaken in public-private partnership arrangements, with significant financial support being provided by the Department of Energy. Moreover, the stated purpose of the large-scale projects is to "validate that CCS can be conducted at a commercial scale." In fact, the relatively small storage capacities of these projects (the largest of which is approximately 5 million metric tons) suggests that they are being conducted at a pilot scale. Technologies in the pilot scale testing stages of development are not considered "available" technologies. Because these pilot scale projects have not yet reached the licensing and commercial stage of development, permanent geological sequestration of CO_2 is not an available technology and has not been demonstrated for any process akin to the Building Heating Systems. Consequently, CCS is considered to be unavailable for the Building Heating Systems due to the lack of demonstrated technology, transportation, and storage locations as well as the incompatibility of the add-on capture systems with the Building Heating Systems design.

However, for the sake of conservatism and in the spirit of a complete and thorough GHG BACT review and to assist in agency review of this PSD application, CCS was carried forward into subsequent steps of the BACT analysis for a representative emission unit in the Bay Minette project scope in Sections 10.3 and 10.4 of the initial PSD application from November 2022. The additional steps of the GHG BACT analysis further demonstrate that CCS should be excluded from consideration when setting GHG BACT limits for the project.

Optimum Combustion Efficiency

GHGs are generated when combustible organics are oxidized. As such, typical add-on combustion controls for organic compound destruction are not considered to be GHG control options. Instead, GHG emissions from combustion units are minimized when highly efficient combustion devices are implemented that require less fuel usage to achieve the desired energy output. Therefore, GHG BACT considerations involve a review

[80] Opdyke, T. Council of State Governments Southern Office. (2025, June). Carbon Capture in the South: What It Is and What Southern States Are Doing. Retrieved from *https://csgsouth.org/policies/carbon-capture-in-the-south-what-it-is-and-what-southern-states-are-doing/*.

[81] Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration (2021, June). Retrieved from *https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf*.

[82] National Energy Technology Laboratory National Carbon Sequestration Database and Interactive Viewer, available online at: https://www.netl.doe.gov/research/coal/carbon-storage/natcarb-atlas

of high efficiency combustion equipment and technology options. By selecting a high efficiency combustion unit, GHG emissions are minimized.

Optimum combustion unit efficiency is a technically feasible consideration for the combustion equipment included in the Building Heating Systems and is incorporated into the unit design.

Fuel Selection

The carbon intensity of fuels can vary significantly across available fossil fuels commonly used in industry. Fuels with low carbon intensity have lower GHG emissions than fuels with high carbon intensity. Therefore, GHG BACT considerations involve the evaluation of low carbon intensity fuel options. By selecting a low carbon fuel, GHG emissions are minimized.

Fuel selection is a technically feasible consideration for the combustion equipment and is incorporated into the process design. Novelis' Building Heating Systems will all combust natural gas, which is a low carbon intensity fuel. The low carbon intensity of natural gas is demonstrated in **Table 9-2**, which shows CO_2 emission factors of various fuels on a heat input basis from EPA's Greenhouse Gas Reporting Program (GHGRP).

Table 9-2. Emission Factors for Various Fuels

Fuel Type	Default CO_2 Emission Factor[83] (kg/MMBtu)
Natural Gas (Weighted U.S. Average)	**53.06**
Propane Gas	61.46
Liquefied Petroleum Gas	61.71
Motor Gasoline	70.22
Distillate Fuel Oil No. 2	73.96
Distillate Fuel Oil No. 6	75.10
Kerosene	75.20
Coal – Bituminous	93.28
Coal – Subbituminous	97.17
Coal – Anthracite	103.69

As illustrated by **Table 9-2**, natural gas produces lower CO_2 emissions per unit of heat input than all other commonly used fossil fuels. As CO_2 represents the vast majority of GHG emissions from fuel combustion, natural gas is considered to be the fossil fuel with the lowest carbon intensity. Therefore, the selection of natural gas as the fuel type for the Building Heating Systems represents BACT for GHG emissions.

Good Combustion and Operating Practices

Good operating practices include good burner maintenance and operation and good air to fuel mixing to promote complete combustion. By operating a combustion unit as efficiently as possible, GHG emissions are minimized.

Novelis will implement good combustion design and operating practices on each piece of combustion unit in the Building Heating Systems. Additionally, design elements that promote complete combustion and

[83] 40 CFR 98 Subpart C, Table C-1 – Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

efficiency are incorporated into the unit design. For example, the larger Building Heating System category units (AS-19a and AS-19b) covered by this GHG BACT analysis incorporate burner alarms for failure of the burner system to properly ignite and achieve stable combustion, discharge temperature set points and alarms for indicating improper heat transfer of hot combustion byproducts to the process air stream, and the previously indicated two stage combustion process for maximizing combustion efficiency. As such, these good operating practices include the optimization of energy efficiency.

9.4.1.5.3 Step 3 – Effectiveness Ranking of GHG Control Technologies for the Building Heating Systems

The remaining process design/work practice-focused control technologies do not have a readily definable GHG removal efficiency in the same sense as a conventional add-on control option for a non-GHG regulated NSR pollutant. **Table 9-3** outlines the control technologies.

Table 9-3. Remaining Control Technologies for the Building Heating Systems Ranked by Effectiveness for GHG

Emission Unit	Control Technology	Control Efficiency
Building Heating System (AS-19a and AS-19b)	CCS	90%
	Optimum Combustion Efficiency	Undefined
	Fuel Selection	Undefined
	Good Design and Operating Practices	Undefined

9.4.1.5.4 Step 4 – Economic, Environmental, and Energy Impacts of GHG Control Technologies for the Building Heating Systems

CCS Cost Analysis

The cost of CCS is difficult to determine due to the amount of experience in actual operation. Many assumptions based on system boundaries, fuel price, capital cost estimation, interest rates, economic lifetime, among other factors can have a large impact. Additionally, a drawback for some capture of the CO_2 capture technologies is the high energy consumption in addition for the potential of steam usage. Despite these factors, an economic evaluation for CCS can be found in **Appendix J** of the original PSD application. Based on the CCS economic evaluation mentioned in **Appendix J** the original application, the estimated total capital investment would be greater than $124 million. It should be noted that the direct annual operating costs of the carbon capture technology, which includes a significant amount of steam and electricity, were not included in this economic evaluation and would add to the very high capital costs. This energy demand would create additional GHG emissions among other pollutants. Due to the difficulty of capturing CO_2 from the Building Heating Systems due to the exhaust characteristics, the extreme cost associated with CCS, the lack of commercial availability, the fluctuating demand for EOR, the lack of viable and proven storage options, and secondary environmental impacts, CCS is determined to be not cost effective for the proposed Building Heating Systems even if it were considered to be available and technically feasible.

Remaining CO_2 Control Technologies

Since they are not mutually exclusive, Novelis has chosen to implement each of the remaining control options: optimum combustion efficiency, fuel selection, and good design and operating practices. There are no significant economic, environmental, or energy impacts associated with the selected control methods.

9.4.1.5.5 Step 5 – BACT Limitations Selection of GHG Control Technologies for the Building Heating Systems

The Building Heating Systems will utilize optimum combustion efficiency, natural gas as fuel, and good design and operating practices as GHG control technologies. Note that GHG emissions from the Building Heating System are due solely to natural gas combustion and are fugitive in nature. Numerical GHG emission limits for the Building Heating Systems are technically infeasible for the same reasons noted for NO_X and CO emissions. The same daily and annual natural gas usage limitations and associated monitoring discussed in the NO_X BACT determination will equally serve in demonstrating compliance with the Building Heating System GHG emissions basis. Additionally, an hourly natural gas usage rate limitation is being accepted according to ADEM's recommendations. Finally, the Building Heating System will be operated and maintained in accordance with the manufacturer's recommendations, instructions, and/or operating manual(s), with any modifications deemed necessary by the facility to operate in an efficient manner and that performance is optimized to limit GHG emissions to the extent possible while considering other operating constraints.

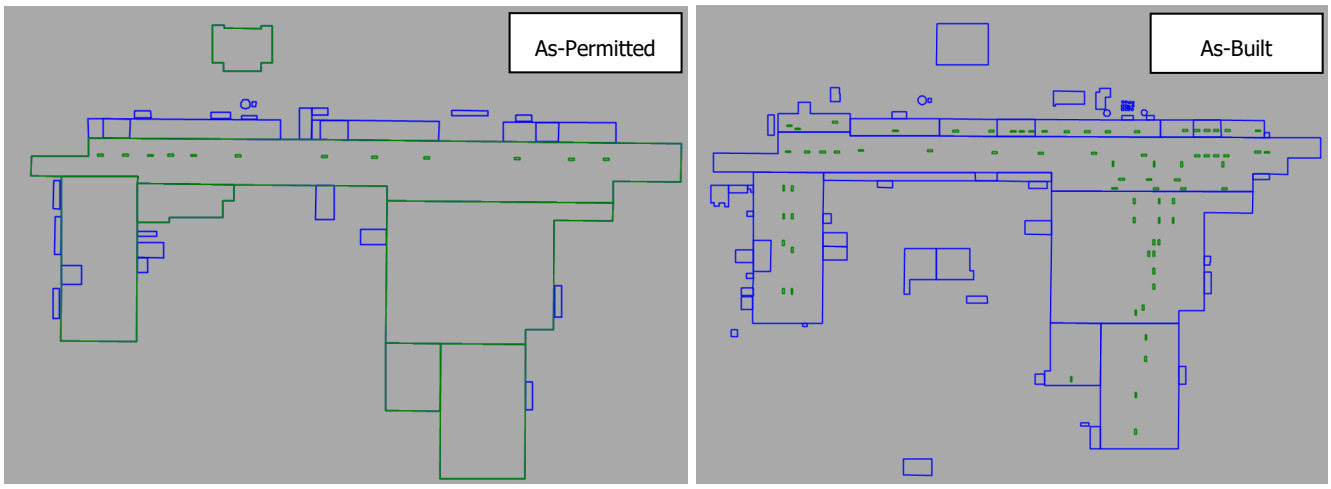
9.5 Air Quality Analysis Updates

The primary as-built changes for the Auxiliary Systems in the BOP category with the potential to influence the air quality analysis include the following items:

- Three originally permitted hot water boilers (BLR1, BLR2, and BLR3) were removed from the project scope during construction. This change reduces overall BOP category Auxiliary System emissions for all criteria pollutants modeled in the as-permitted configuration. Therefore, this change does not introduce any new air quality concerns and represents a net decrease in modeled emissions for the affected sources for each pollutant and applicable averaging period.
- Three additional cooling towers were installed beyond the two cooling towers included in the as-permitted configuration. These installations include: (1) the Cold Mill Cooling Tower (CT3C1-CT3C4), a 4-cell tower that is located directly north of the Cold Mill Utility Building #1 (CLDMILL1); (2) the Finishing Cooling Tower (CT4C1, CT4C2), a 2-cell cooling tower located west of the Coil Finishing Building (FNSH); and (3) The Round Tops/Pushers Cooling Tower (CT5C1, CT5C2), a 2-cell cooling tower located east of the Melting & Casting Building (MELTCST). In addition, the General Plant Cooling Tower was reduced in size with respect to both the recirculating water flow rate and the corresponding $PM/PM_{10}/PM_{2.5}$ emission rates and renamed the Hot Mill Cooling Tower (CT2C1-CT2C6).
  - The additional cooling towers do not introduce changes to building downwash conditions pertaining to the existing stacks. The PM_{10} and $PM_{2.5}$ emissions from these towers are significantly offset by the removal of the hot water boilers. For example, the reduced size of the previously modeled General Plant Cooling Tower and associated reduction in maximum hourly potential PM_{10} emissions decrease (0.06 lb PM_{10}/hr) added with the combined emissions decrease from the removal of the boilers (0.25 lb PM_{10}/hr) is greater than the combined hourly potential PM_{10} emissions increase from the as-built new cooling towers (0.10 lbs PM_{10}/hr).
- The number of building heating units increased from 56 in the as-permitted configuration to 66 in the as-built configuration. Fugitive air emissions released by these natural gas-fired units were initially modeled as polygon area sources that covered the entire building roof footprint. In the as-built configuration, fugitive emissions are assigned to the specific roof vents characterized as smaller rectangular area sources. Refer to **Figure 9-1** for a comparison of the "plot plan" (looking down) view of the facility-wide area sources in the as-permitted and as-built configurations.

- This change results in air emissions being more concentrated at roof vent locations rather than dispersed across the entire building roof footprint. However, both configurations release emissions at building height and are subject to the same meteorology and plume dispersion characteristics.
- With the introduction of an annual operating limitation on natural gas usage for the Building Heating Systems emission unit grouping, the modeled emission rates for all criteria pollutants with annual standard would remain unchanged between the as-permitted and as-built configurations. Therefore, the change in the number and maximum hourly heat input capacity of the Building Heating Systems does not directly translate into a corresponding increase in modeled emission rates for pollutants with annual averaging periods.
- As discussed in **Section 9.2.4**, Novelis is also proposing a daily average operating limitation on natural gas usage for the Building Heating Systems emission unit grouping to support the modeled emission rate basis for the 24-hour PM_{10}, 24-hour $PM_{2.5}$, and 1-hr NO_2 modeling analysis. At ADEM's request, an hourly operating limitation on natural gas usage is also being accepted to support the modeling analysis.

Figure 9-1. Area Source As-Permitted vs. As-Built Modeling Setup Comparison (Plot Plan View)



10. PROCESS SUPPORT AUXILIARY SYSTEMS

As discussed in **Section 9**, the Auxiliary Systems are addressed in separate categories for BOP operations and process support operations. This section addresses as-built changes for the remaining Auxiliary Systems in the process support operations category.

10.1 Process Equipment Changes

10.1.1 Updates to As-Permitted Process Equipment Specifications

As documented in Section 33 of **Appendix C**, all of the previously covered storage tanks in the Hot Rolling Area (AS-22), Cold Rolling Area (AS-23), and Coil Finishing Area (AS-24) include as-built changes to reconcile the storage capacity, throughput, and tank dimensions to the final engineering design basis provided by the various vendors supplying these storage systems.

10.1.2 Removal of As-Permitted Equipment

The following originally permitted equipment was removed from the final project scope design and will not be installed.

- Two (2) Hot Rolling Area Process Storage Tanks (AS-22),
  - RM Emulsion Storage Tank for Cleaning and
  - FM Emulsion Storage Tank for Cleaning and
- One (1) of the Hot Baghouse Lime Silos (AS-20).

10.1.3 Addition of New Emission Units

10.1.3.1 Addition of Auxiliary Storage Tanks for Process Operations

As documented in Section 31 of **Appendix C**, two (2) silos similar in design to the Hot Baghouse Lime Silos have been added to the project scope for storing and delivering dry sorbent to the Cold Baghouses #1 through #4 (CBH1 through CBH4) in the Scrap Processing Area. These silos are combined into one emission unit designation [Cold Baghouse Dry Sorbent Silos (2) (AS-33)]. Each silo has its own integral bin vent to control PM emissions from pneumatically loading dry sorbent into the silos. The type of dry sorbent currently planned to be used to support the PM removal processes in the CBH is diatomaceous earth, but Novelis reserves the right to use other similar mineral products for achieving the desired function of the dry sorbent. The primary purpose of the intermitted dry sorbent injection to the CBH is to absorb any heavy oils or other liquids which could affect the PM removal effectiveness of the filter cake.

Several new tanks have been added to the Cold Rolling and Coil Finishing areas to meet the specific liquid material storage needs of the Bay Minette facility. The number of process tanks needed to support the Tandem Cold Mill (CR-01) increased from six (6) fixed roof or open top storage tanks to thirteen (13) storage tanks all with vertical fixed roof designs. The original six tanks have been renamed and resized so that the complete list of thirteen (13) Cold Rolling Area Storage Tanks (22) (AS-23) is as follows (where each new tank is designated in bold):

- TCM Emulsion Main Tank- Dirty Section (T1)
- TCM Emulsion Main Tank- Clean Section (T1)
- TCM Rolling Oil Separator Tank (T3)

- TCM Main Oil Separation Tank (T2) [*New Tank for As-Built*]
- TCM Rolling Oil System Tank -Clean Section (T4)
- TCM Rolling Oil System Tank -Dirty Section (T4)
- TCM Rolling Oil System Tank -Circ Section (T4)
- TCM HES System Main Oil Tank (T5),
- TCM Base Rolling Oil Supply Tank (T6) [*New Tank for As-Built*]
- TCM Multi-Plate Filter Mixing Tank 1 (T2.1) [*New Tank for As-Built*]
- TCM Multi-Plate Filter Mixing Tank 2 (T2.2) [*New Tank for As-Built*]
- Rolling Oil Bulk Supply Tank #1 (TK-0001) [*New Tank for As-Built*]
- Rolling Oil Bulk Supply Tank #2 (TK-0002) [*New Tank for As-Built*]

The Coil Finishing Area Storage Tanks (AS-24) increased in number from nine (9) to twenty-two (22) fixed roof tanks. The twenty-two (22) tanks are made up of ten (10) primary bulk storage tanks [nine (9) previously permitted tanks and one (1) new tank] and twelve (12) support day tanks that are newly added with the as-built changes to the Coil Finishing area. As discussed previously, all of key design parameters for the previously included Coil Finishing storage tanks have been updated to match the final engineering design basis for the coating and chemical supply systems for the Coating Line. The tanks added to the Coil Finishing Area Storage Tanks (22) (AS-24) include the following:

- Coating Line Tank G,
- Alkaline Cleaning Day Tank,
- Paint Day Tank 1,
- Paint Day Tank 2,
- Paint Day Tank 3,
- Paint Day Tank 4,
- Paint Day Tank 5,
- Paint Day Tank 6,
- Paint Day Tank 7,
- Pretreatment Day Tank 1,
- Pretreatment Day Tank 2,
- Pretreatment Day Tank 3, and
- Pretreatment Day Tank 4.

All pertinent design specifications, process rates, tank contents, and other relevant inputs to the emission calculations for the Process Storage Tanks can be found in Section 33 of **Appendix C**.

10.1.3.2 Addition of Other Process Support Auxiliary Systems

As described in **Sections 2.3.6.10 to 2.3.6.17**, the following units have been added to the Auxiliary Systems area supporting various final specific project scope determined through final detailed process area designs:

- Anodizing Test Unit (AS-34),
- Filtering Aid Material Handling (AS-35),
- Cold Mill Coil Marking Machine (AS-36),
- Mill Roll Grinding Machines (3) (AS-37),
- Coil Finishing Roll Grinding Machine (AS-38),
- Bearings Washing Machine (AS-39),
- Hot Mill Parts Washing Bay (AS-40),
- Roll Shop Parts Washers (4) (AS-41), and

- Maintenance Parts Washers (7) (AS-42).

10.1.3.3 Addition of Auxiliary Systems in WWTP

As described in **Section 2.3.6.18**, the onsite WWTP also has new emission units associated with the treatment of wastewater from various facility areas. The following emission units relating to the WWTP have been identified and documented as emissions generating activities to show the low overall VOC emissions associated with the WWTP equipment:

- WWTP- Hot Mill Oil Tanks (2) (AS-43a),
- WWTP- Cold Mill Oil Tank (AS-43b),
- WWTP- Hot Mill DAF (AS-43c), and
- WWTP- Cold Mill DAF (AS-43d).

10.2 Control Device Changes

None of the previously permitted process support auxiliary systems were equipped with any add-on control devices. However, some of the added units have control devices associated with the process equipment additions, as follows:

- The Anodizing Test Unit (AS-34) has a scrubber used to control PM and sulfuric acid mist (H_2SO_4) emissions.
- The PM emissions from the Coil Finishing Roll Grinding Machine (AS-38) are routed to an integral cyclone and filtration unit which acts to both collected removed roll grindings for disposal and to control PM emissions.
- The Bearings Washing Machine (AS-39) is equipped with an integrated demister for removal of water droplets and incidental control any condensed VOC emissions.

10.3 Air Emissions Changes

10.3.1 Hot Baghouse Lime Silos Air Emissions Quantification

The hot baghouse silos contain integrated bin vents to control PM emissions created by loading events. The methodology for estimating the PM emissions from the silos has not changed from the method presented in the initial PSD application. A grain loading rate of 0.01 gr/dscf was utilized based on the design basis of the bin vents used. Additionally, the bin vents are rated at a flow capacity of 1,035 dscfm which can be converted into an hourly emission rate and then used to determine annual emissions based on hours of operation. The methodology for calculating annual operating hours has not changed from the initial PSD application. The annual operation is determined by comparing the maximum annual throughput of lime, the tons of lime delivered by truck, and the time required to complete each loading event. With the conservative assumption that each loading event takes an hour, it was determined that there would be a maximum of 315 hr/yr of emissions generating operation of the Hot Baghouse Lime Silos. Detailed emission calculations for the Hot Baghouse Silos (5) (AS-20) shown in Section 31 of **Appendix C** confirm the source can be classified as insignificant.

10.3.2 Cold Baghouse Dry Sorbent Silos Air Emissions Quantification

The cold baghouse silos contain integrated bin vents to control PM emissions created by loading events. To estimate the potential hourly emissions rate, a grain loading rate of 0.01 gr/dscf and a flow capacity of 1,035 dscfm was used based on the design basis of the bin vents. Potential annual emissions rates can then be estimated using the hours of operation in a year. To determine annual operation hours, the dosing rate of dry sorbent needed to meet the design for Cold Baghouses #1 through #4 (CBH1 through CBH4) was compared to the silo capacity to determine the number of refilling events needed annually. The filling event was conservatively assumed to take an hour, so the maximum annual operating hours were determined to be 0.87 hr/yr. The resulting emissions are lower than the significant threshold of 5 tpy of any criteria pollutant; therefore, the Cold Baghouse Lime Silos (2) (AS-33) are an insignificant source of emissions. Detailed calculations supporting this determination are shown in Section 31 of **Appendix C**.

10.3.3 Hot Rolling Area Storage Tanks Air Emissions Quantification

VOC emissions may be generated from the storage of volatile organic liquids (VOL) in the fourteen (14) fixed roof storage tanks that make up the Hot Rolling Area Storage Tanks (14) (AS-22). The storage tanks within the Hot Rolling area will either manage coolant supply for the HRM or HFM. VOC emissions are generated due to evaporative losses of stored material due to cyclical fluctuations in storage temperature (i.e., breathing losses) and from vapor displacement caused when material is loaded into the tank (i.e., working losses). There have been no changes in the emissions estimation methodology presented in the initial PSD application. Novelis has calculated the potential VOC emissions (no HAP associated with these tanks) from all tanks using TankESP® as shown in Section 33 of **Appendix C**, where a summary of the main tank parameters and emissions output can be found. Detailed TankESP® reports on an individual tank basis are available as an electronic attachment upon request by ADEM.

Any SDS referenced in the development of hot rolling storage tank potential emissions can be found in **Appendix E**.

There are seven (7) tanks that are associated with the coolant filtration and temperature management of the water/coolant emulsion used in the HRM. A basic description of the purpose of each tank is described in **Section 2.3.6.7**. Novelis has assigned a representative set of TankESP® "stock" input parameters for the hydrocarbon fraction of the HRM coolant based on a chemical surrogate approach. The properties of the selected chemical surrogate were established from the SDS based on the most volatile component of the coolant package - base rolling oil or highly refined hydrotreated heavy naphthenic petroleum distillate. The chosen HRM coolant surrogate chemical was determined to be hexadecane ($C_{16}H_{34}$). The assigned liquid and vapor molecular weights were sourced from a TankESP® speciation profile for hexadecane. The liquid density assigned to the surrogate was obtained from the SDS of the base rolling oil used.

Similar to the HRM, the HFM will be associated with seven (7) tanks to manage the water/coolant emulsion used at the HFM. A basic description of the purpose of each tank is described in **Section 2.3.6.7**. Novelis has assigned a representative set of TankESP® "stock" input parameters for the hydrocarbon fraction of the HFM coolant based on a chemical surrogate approach. The properties of the selected chemical surrogate were established from the SDS based on the most volatile component of the base rolling oil. The chosen HFM coolant surrogate chemical was determined to be pentadecane ($C_{15}H_{33}$). The assigned liquid and vapor molecular weights were sourced from a TankESP® speciation profile for pentadecane while the liquid density was sourced from the SDS for the base rolling oil used in the HFM.

The combined total potential VOC emissions for the Hot Rolling Area Storage Tanks (14) [AS-22] is 4.14 tpy which allows for the classification of the tanks as a group of insignificant activities. As such, these tanks are

not included on ADEM Form 108 for Loading and Storage of Organic Compounds but only listed on Section 12 of ADEM Form 103 which identifies insignificant activities.

10.3.4 Cold Rolling Area Storage Tanks Air Emissions Quantification

The thirteen (13) fixed roof storage tanks that make up the Cold Rolling Area Storage Tanks (13) (AS-23) manage the coolant filtration and temperature management of the water/coolant emulsion used in the TCM. A basic description of the purpose of each tank is described in **Section 2.3.6.7**. VOC emissions may be generated via breathing and working losses associated with the storage of VOL in the tanks. There have been no changes in the emissions estimation methodology presented in the initial PSD application. Novelis has calculated the potential VOC emissions (no HAP associated with these tanks) from all tanks using TankESP® as shown in Section 33 of **Appendix C**, where a summary of the main tank parameters and emissions output can be found. Detailed TankESP® reports on an individual tank basis are available as an electronic attachment upon request by ADEM. The maximum annual throughputs assigned to some of the Cold Rolling area tanks consider the level-controlled nature of these tanks operating in the coolant recirculation loops, and thus, the assigned throughput rates do not match the coolant/rolling oil flow capacities in all cases.

Novelis has assigned a representative set of TankESP® "stock" input parameters for the hydrocarbon fraction of the TCM coolant based on a chemical surrogate approach. The properties of the selected chemical surrogate were established from the SDS, found in **Appendix E**, based on the most volatile component within the base rolling oil. The chosen defining chemical for the TCM coolant surrogate was determined to be tetradecane ($C_{14}H_{30}$). The assigned liquid and vapor molecular weights were sourced from a TankESP® speciation profile for tetradecane, and the liquid density presented in the SDS was assigned to the surrogate.

The combined total potential VOC emissions for the Cold Rolling Area Storage Tanks (13) [AS-23] is 0.0075 tpy which allows for the classification of the tanks as a group of insignificant activities. As such, these tanks are not included on ADEM Form 108 for Loading and Storage of Organic Compounds but only listed on Section 12 of ADEM Form 103 which identifies insignificant activities.

10.3.5 Coil Finishing Storage Tanks Air Emissions Quantification

The twenty-two (22) fixed roof storage tanks that make up the Coil Finishing Area Storage Tanks (22) (AS-24) support various process operations associated with the Coil Coating Line. A brief description of the purpose of each tank is described in **Section 2.3.6.7**. VOC and HAP emissions may be generated via breathing and working losses associated with the storage of VOL in the tanks. There have been no changes in the emissions estimation methodology presented in the initial PSD application. Novelis has calculated the potential VOC and HAP emissions from all tanks that store a material containing VOC, HAP, or other regulated air pollutants using TankESP® as shown in Section 33 of **Appendix C**, where a summary of the main tank parameters and emissions output can be found. Detailed TankESP® reports on an individual tank basis are available as an electronic attachment upon request by ADEM.

Section 33.4.4 of **Appendix C** details each stored material for each tank and indicates whether the material is appropriate to be modeled with TankESP®. For most of the materials that could be modeled, the "stock" properties were developed using the full speciation option built into TankESP® which requires the detailed liquid phase compositions of the stored material. All components for all materials were sourced from the SDS and/or the Composition of Organic Volatiles sheet which can be located in **Appendix E**. Detailed material composition is also included in Section 33.4.4 of **Appendix** C. The exception to this method of defining "stock" is the Stage 1 and Stage 2 alkaline cleaning chemical recirculation tanks which utilized the

chemical surrogate method. There were no changes to the chemical surrogate for this material from that which was presented in the initial PSD application.

The total combined potential VOC and HAP emissions are estimated at 0.27 tpy and 0.23 tpy, respectively. As such, the Coil Finishing Area Storage Tanks (22) [AS-24] can be classified as insignificant and are not included on ADEM Form 108 for Loading and Storage of Organic Compounds but only listed on Section 12 of ADEM Form 103 which identifies insignificant activities.

10.3.6 Anodizing Test Unit Air Emissions Quantification

The Anodizing Test Unit (AS-34) will coat sample sheets of aluminum in an abrasion and corrosion-resistant oxide layer using sulfuric acid anodization. The uncontrolled PM emission factor for the Anodizing Test Unit is obtained from AP-42 Table 12.20-2 for chromic acid anodizing assuming the proposed sulfuric acid anodizing process would generate a similar uncontrolled PM emissions profile based on the same electroplating concepts behind both types of anodizing systems. The controlled sulfuric acid emission factor is based on an empirical equation from a technical reference publication (*Characterizing Site Specific Source Emissions for EPA's Risk Assessment Tool for the Metal Finishing Industry*) cited in the air permit technical support document for a similar operation at a metals manufacturing facility.[84] With negligible potential emissions (~0.0005 tpy $PM/PM_{10}/PM_{2.5}$ and ~0.05 H_2SO_4), the Anodizing Test Unit is listed as an insignificant activity on Section 12 of ADEM Form 103.

10.3.7 Filtering Aid Material Handling Air Emissions Quantification

The Filtering Aid Material Handling (AS-35) process is a small source of fugitive PM emissions released into the Cold Mill building from the process of dumping bags into the open hatch of each of the two (2) TCM Multi-Plate Filter Mixing Tanks (AS-23). As documented in Section 36 of **Appendix C**, the fugitive PM emissions potentially released from the filtering aid (e.g., diatomaceous earth and Fuller's earth) handling process are estimated using the "drop point" equation in AP-42 Chapter 13.2.4 for Aggregate Handling and Storage Piles commonly used for material transfer points across a wide range of applications. Novelis has applied a conservatively high assumption for the wind speed (5 mph) required for this equation to represent the indoor location of the filtering aid mixing tanks and to account for any potential air currents in the production building with the potential to generate fugitive PM from the column of material being dropped from bags into the liquid roll coolant surface of the tank. The moisture content of the filtering aid is obtained from engineering data for similar materials and represents a worst-case, low value for the purposes of ensuring the conservatism of the resulting $PM/PM_{10}/PM_{2.5}$ emission factors. Due to the negligible PM emissions level associated with the uncontrolled emissions estimates (~0.001 tpy), no control credit for any reduction of fugitive PM emissions from the filtering aid mixing tank room enclosure or larger Cold Mill production building have been included in the potential PM emission calculations. The Filtering Aid Material Handling process is listed as an insignificant activity on Section 12 of ADEM Form 103.

10.3.8 Cold Mill Coil Marking Machine Air Emissions Quantification

The Cold Mill Coil Marking Machine (AS-36) is a source of VOC emissions from evaporative loss of applied inks and solvents associated with the direct application of markings on the warm exterior surface of the coils for Novelis internal production and customer tracking purposes. As documented in Section 37 of **Appendix C**, Novelis has conservatively assumed 100% loss to the air phase of any VOC content present in the applied inks and coatings based on continuous operation at the maximum hourly application rate associated with the Coil Marking Machine. The resulting annual potential VOC emissions (~2.7 tpy) would classify the

[84] https://anrweb.vt.gov/PubDocs/DEC/Air/Permits/1509.pdf

Cold Mill Coil Marking Machine as "otherwise" insignificant in a similar manner to the process area storage tanks which ADEM chose not to address via a unit-specific PSD permit. Based on this emission unit status, Novelis has included the Coil Marking Machine with other similar process support Auxiliary Systems on Section 12 of the ADEM Form 103.

10.3.9 Mill Roll Grinding Machines Air Emissions Quantification

The water-coolant emulsion used in the wet rolling grinding process performed at each of the three (3) Mill Roll Grinding Machines (AS-37) has the potential to generate fugitive VOC emissions from evaporative loss of the heavy/high molecular weight, petroleum distillate-based coolant. As documented in Section 38 of **Appendix C**, Novelis has conservatively assumed that 100% of the low VOC content in the small percentage of coolant (4%) in the water-based emulsion would evaporate and generate fugitive VOC emissions. The resulting annual potential VOC emissions from each of the Mill Roll Grinding Machines (1.42 tpy) qualifies these units for categorization as otherwise insignificant and for coverage on Section 12 of the ADEM Form 103.

10.3.10 Coil Finishing Roll Grinding Machine Air Emissions Quantification

The Coil Finishing Roll Grinding Machine (AS-38) acts as a maintenance support activity for maintaining the surface quality of polyurethane rollers used in the Coil Finishing area and is a source of PM emissions from collection of the removed roll grindings. As documented in Section 39 of **Appendix C**, the integral cyclone/filtration unit is assigned a nominal filterable PM exit grain loading (0.01 gr/dscf) which is representative of the expected PM emissions performance for similar small-scale filtration devices operating as part of integral product collection systems (e.g., silo bin vent filters and dross press filtration units) and which is also consistent with EPA literature for nominal performance of similar, well-designed filtration based PM control devices. The filterable PM exit grain loading is combined with the flow capacity of the fan serving the roll grindings collection system and associated cyclone/filter to calculate the maximum hourly potential PM emissions which is then normalized to the batch process rate representing the number of rolls able to be processed within a single operating hour to produce a lb/roll emission factor. The minimal annual potential PM emissions (~0.7 tpy) is determined from this short-term potential emission factor and the maximum number of rolls expected to be processed annually to support the Coil Finishing operations. The Coil Finishing Roll Grinding Machine is designated in the otherwise insignificant category and included in Section 12 of the ADEM Form 103.

10.3.11 Bearings Washing Machine Air Emissions Quantification

The Bearings Washing Machine (AS-39) is a source of VOC emissions from possible evaporative loss of the organic chemical fraction of the specialized, water-based cleaning solution used in this equipment supporting machine maintenance activities in the rolling mills. As documented in Section 40 of **Appendix C**, VOC emissions from the Bearings Washing Machine are calculated from a mass balance using the following key input data:

- Maximum cleaning solution (water + cleaner) hourly usage rate from the engineering design specification for the amount of solution required per washing event
- Maximum alkaline cleaning chemical content of the solution obtained from vendor specifications for recommended use of the cleaning chemical
- Cleaning chemical density and volatile organic composition from the SDS provided in **Appendix E**
- Air phase loss percentages of volatile organic chemicals found in common detergents from a reference publication (*Calculation of Component Chemical Air Emission Factors for: Hand Dishwashing Detergents,*

Liquid Laundry Detergent, Liquid Fabric Softener) to estimate the fraction of volatile organic chemicals in the alkaline cleaner that may generate VOC emissions[85]

- Conservatively high safety factor (10X) to account for any differences between the operating conditions of residential/commercial use of detergents and the industrial application associated with the Bearings Washing Machine

The annual potential VOC emissions for the Bearings Washing Machine (~1.8 tpy) are calculated assuming continuous use based on the batch operating cycle time and the per washing event VOC emission factor derived based on the above input data. The Bearings Washing Machine is designated in the otherwise insignificant category and included in Section 12 of the ADEM Form 103.

10.3.12 Hot Mill Parts Washing Bay Air Emissions Quantification

The Hot Mill Parts Washing Bay (AS-40) is a potential source of fugitive VOC emissions from the water-based cleaning solution used in the spray guns (similar to a residential/commercial pressure washer). As documented in Section 41 of **Appendix C**, the potential VOC emissions associated with this operation (1.8 tpy) are conservatively calculated from the maximum hourly cleaning fluid flow rate and VOC content of the cleaning chemical concentrate, where all VOC present in the cleaning chemical is conservatively assumed to evaporate and generate fugitive VOC emissions. The low annual potential VOC emissions from the Hot Mill Parts Washing Bay qualifies for this emission unit for designation in the otherwise insignificant category and for coverage on Section 12 of the ADEM Form 103.

10.3.13 Small Parts Washers Air Emissions Quantification

Two (2) types of small parts washers are planned to be installed at the Bay Minette facility for periodic maintenance activities involving cleaning of small parts and tools. The following sections address the VOC emission calculation methodology for each of these small parts washer categories.

10.3.13.1 Roll Shop Parts Washers Air Emissions Quantification

Four (4) drum-mounted Roll Shop Parts Washers will be used to clean small parts and tools using a specialized cleaning fluid targeting the removal of emulsions associated with the rolling mills coolant supply systems. As documented in Section 42 of **Appendix C**, the potential VOC emissions from the Roll Shop Parts Washers are conservatively calculated based on the maximum cleaning fluid usage per washing event, the VOC content of the cleaning fluid, and a worst-case estimate for the number of washing events per parts washer required to serve the maintenance needs of the rolling mills. The resulting annual potential VOC emissions are minimal on both a per parts washer and combined basis [0.13 tpy per parts washer and 0.53 tpy combined for all four (4) parts washers] and support an insignificant activity designation and coverage on Section 12 of the ADEM Form 103.

10.3.13.2 Maintenance Shop Parts Washers Air Emissions Quantification

Seven (7) "free-standing" base mounted Maintenance Shop Parts Washers with a cleaning fluid reservoir volume of 81.5 gal and a sink-type basin and associated faucet/spray wand type cleaning fluid applicator will be used for standard maintenance shop parts cleaning activities at various locations across the Bay Minette facility. As documented in Section 42 of **Appendix C**, the maximum hourly potential VOC emission rate is calculated using an applicable equation (Eq. 3-23) from EPA's Emissions Inventory Improvement Program (EIIP) documentation for *Methods for Estimating Air Emissions from Chemical Manufacturing*

[85] https://www.cleaninginstitute.org/sites/default/files/research-pdfs/Cleaning_Product_Air_Emissions_from_WWTPs_-_1.pdf

Facilities (Volume II Chapter 16) addressing "Evaporation from an Open Top Vessel or a Spill."[86] This open top vessel evaporative loss model requires inputs for the evaporation surface area, solvent vapor pressure, liquid surface temperature, and mass transfer coefficient, where the mass transfer coefficient is calculated from a separate Eq. 3-27 using water as a reference benchmark and requiring a molecular weight estimate for the solvent. The parts washer maximum basin surface area is obtained from the design specifications for a representative unit.

The solvent vapor pressure and molecular weight are estimated using properties and composition details from the SDS in **Appendix E**. The assumed operating temperature of the parts washer is set to a standard conditions reference (68 deg. F) based on no heating of the cleaning solution and ambient building temperatures that would be present in maintenance shops located in various support buildings around the Bay Minette facility. The resulting hourly potential VOC emission rate is then used to determine the number of cleaning solution makeup events/turnovers that would need to occur annually to ensure an adequate amount of cleaning fluid is present in the system at all times. The annual potential VOC emission rate for each Maintenance Parts Washer is negligible (~0.4 tpy), and the combined total annual potential VOC emissions rate for all seven (7) Maintenance Parts Washer is also sufficiently low to allow for the otherwise insignificant designation and coverage on Section 12 of the ADEM Form 103.

10.3.14 Waste Water Treatment Plant Air Emissions Quantification

As discussed in **Section 2.3.6.18**, Novelis has identified the WWTP - Hot Mill Oil Tanks (2) (AS-43a), WWTP – Cold Mill Oil Tanks (AS-43b), WWTP- Hot Mill DAF (AS-43c), and WWTP- Cold Mill DAF (AS-43c) as the unit operations within the WWTP with the highest VOC emissions generating potential within the overall WWTP design. The VOC emission calculation methodologies and summary of annual potential emissions for these WWTP sources are documented in the following subsections.

10.3.14.1 Waste Water Treatment Plant – Hot Mill Oil Tanks

Two (2) 10,000 gallon vertical fixed roof tanks will store recovered hot mill coolant/rolling oil generated by the initial oil-water separation stages of the Hot Mill portion of the WWTP. As documented in Section 43 of **Appendix C** and further described in **Section 10.3.3**, Novelis has estimated potential VOC emissions from the WWTP Hot Mill Oil Tanks using the same TankESP®-based techniques applied to all other Hot Rolling area tanks storing coolant/rolling oils with the same basic physical and chemical properties as the material stored in the WWTP Hot Mill Oil Tanks. With relatively low annual throughputs in comparison to the Hot Rolling area tanks tied directly to the coolant supply system, the WWTP Hot Mill Oil Tanks have negligible annual potential VOC emissions (0.007 tpy) which qualifies these tanks for the same treatment as all other process support tanks with respect to insignificant source status and ADEM Form 103 Section 12 coverage.

10.3.14.2 Waste Water Treatment Plant – Cold Mill Oil Tank

Following the same basic operating principles as the WWTP Hot Mill Oil Tanks, one (1) 20,000 gallon vertical fixed roof tank will store recovered cold mill coolant/rolling oil generated by the initial oil-water separation stages of the Cold Mill portion of the WWTP. As documented in Section 43 of **Appendix C** and further described in **Section 10.3.4**, Novelis has estimated potential VOC emissions from the WWTP Cold Mill Oil Tanks using the same TankESP®-based techniques applied to all other Cold Rolling area tanks storing coolant/rolling oils with the same basic physical and chemical properties as the material stored in the WWTP Cold Mill Oil Tanks. With relatively low annual throughputs in comparison to the Cold Rolling area tanks tied

[86] EPA EIIP Volume II Chapter 16 - *Methods for Estimating Air Emissions from Chemical Manufacturing Facilities*, August 2007 Final, https://www.epa.gov/sites/default/files/2015-08/documents/ii16_aug2007final.pdf

directly to the coolant supply system, the WWTP Cold Mill Oil Tanks have negligible annual potential VOC emissions (~0.02 tpy) which qualifies these tanks for the same treatment as all other process support tanks with respect to insignificant source status and ADEM Form 103 Section 12 coverage.

10.3.14.3 Waste Water Treatment Plant – Hot Mill Dissolved Air Filtration Unit

The WWTP Hot Mill DAF (AS-43c) (and similar Cold Mill DAF) generate VOC emissions through two (2) basic mechanisms: 1) storage tank-like evaporative losses from breathing and working loss mechanisms analogous to the WWTP Hot Mill Oil Tanks from any non-emulsified, non-soluble, "free" coolants/rolling oils that could be present on the liquid surface of the DAF, and 2) entrained coolant/rolling oil vapors picked up by the flotation air as it passes through the oily wastewater in the DAF. For the first VOC air emissions generating mechanism of the Hot Mil DAF, the storage tank-like evaporative loss-based VOC emissions are estimated using TankESP® using the same general inputs and calculation methods applied to the Hot Rolling Oil Tanks. For the second VOC air emissions generating mechanism of the Hot Mill DAF, the maximum flow rate for the diffused air flow rate is used with a saturated chemical concentration estimate to determine the maximum hourly and annual mass flow rate of VOC in the diffused air stream discharge from the surface of the DAF. The saturated composition of VOC in the diffused air is calculated from the Antoine's coefficient of the lower molecular weight and higher volatility HFM coolant/rolling oil chemical surrogate (pentadecane) at the worst-case (highest) operating temperature of the Hot Mill DAF, even though the hot mill coolant/rolling oil present in the Hot Mill portion of the WWTP would also include contributions from the higher molecular weight and lower volatility HRM coolant/rolling oil. The combined annual potential VOC emission rate from both VOC emissions generating mechanisms of the Hot Mill DAF are negligible (~0.02 tpy) which qualifies this additional WWTP operation for the same treatment as all other process support tanks with respect to insignificant source status and ADEM Form 103 Section 12 coverage.

10.3.14.4 Waste Water Treatment Plant – Cold Mill Dissolved Air Filtration Unit

The VOC emission calculation methodology for the WWTP Cold Mill DAF (AS-43d) is equivalent to the Hot Mill DAF where the only differences are the assumed chemical surrogate for cold rolling coolant/rolling oil (tetradecane), DAF operating temperature (ambient conditions), and TankESP® inputs for maximum wastewater throughputs. The combined annual potential VOC emission rate from both VOC emissions generating mechanisms of the Cold Mill DAF are negligible (~0.002 tpy) and even lower than for the Hot Mill DAF which qualifies this additional WWTP operation for the same treatment as all other process support tanks with respect to insignificant source status and ADEM Form 103 Section 12 coverage.

10.4 Applicable Requirements Summary for New Emission Units

None of the newly added process support Auxiliary Systems are affected source under potentially applicable NSPS and NESHAP subparts. Furthermore, all of the relevant non-applicability statements for ADEM SIP regulations presented in Section 4.3 of the original PSD application continue to apply to the as-built configuration of the process support Auxiliary Systems. ADEM Admin. Code R. 335-3-6-.12 – Solvent Metal Cleaning does not apply to the Roll Shop Parts Washers (AS-41) or the Maintenance Parts Washers (AS-42) both because the air/vapor interface area is less than the applicability threshold and the cleaning fluid vapor pressure is less than the solvent volatility thresholds in this regulation for cold cleaner-type metal cleaning equipment.

10.5 Suggested PSD Permit Coverage

As documented in the "Air Const. Permit No." column of the Emission Unit Index in **Appendix A**, Novelis is requesting that ADEM utilize the same discretion in how to treat the newly added, process support Auxiliary

Systems in the as-built configuration of the Bay Minette facility in the same manner as other small/ insignificant/negligible sources of regulated NSR pollutants from similar sources included in the original PSD permitting basis by not specifically adding these process support Auxiliary Systems to an already issued and/or new PSD construction permit. Rather, these newly added process support Auxiliary Systems associated with as-built configuration of the Bay Minette facility can generally all be considered insignificant sources of fugitive or otherwise not reasonably quantifiable regulated NSR pollutant emissions which would warrant any need for specific monitoring or testing requirements, but can more efficiently be addressed through the generally applicable provisions and requirements of the already issued PSD permits and other ADEM SIP regulations concerning proper operation of emissions generating activities for minimizing emissions (i.e., "general duty" requirements).

10.6 BACT Determination

In the original application for the Bay Minette site, equipment that would be considered insignificant activities because they are small sources that are otherwise only subject to generally applicable requirements, were deemed not technically feasible for BACT considerations because their emissions cannot be reasonably or practically captured in a hood or duct for subsequent measurement using EPA Reference Test Methods. The following types of units were considered insignificant sources in the original application:

- Small interior natural gas combustion sources (i.e., CFF/DBF/Trough Heaters)
- Building Heating Systems
- Melting and Casting Area Fugitive VOC emissions
- Small storage vessels for Hot Rolling, Cold Rolling, and Coil Finishing
- Diesel fuel storage
- Lime Silos

In the original as-permitted construction permits (X001-X022) issued by ADEM on February 3, 2023, BACT limits for these types of sources were not established. In cases where emissions cannot be feasibly or practically measured, work practice standards can be established as BACT in lieu of emission limits. Such work practice standards will be mandated through Novelis' proposed "general duty" requirement to "maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions" and in general follow recommended supplier operating and maintenance manuals, instructions and practices associated with each piece of equipment.

The aforementioned silos, tanks/storage vessels, and material handling units discussed in this section are all similar small sources of emissions that have previously been determined to be insignificant as noted in the list above. Novelis believes that the changes to these units discussed herein do not impact the former conclusion that BACT emission limits are not necessary. Therefore, further BACT consideration is not needed and no additional compliance requirements are warranted.

For the other units that are now being considered as part of the new as-built site configuration and for which BACT determinations have not been previously established, Novelis is providing justification that these units should also be considered as insignificant sources of emissions due to low emissions profile for each of these units and no federal air rule applicability and therefore further BACT considerations are not necessary.

- **Anodizing Test Unit** (AS-34) - Total potential emissions from the Anodizing Test Unit are less than one (1) tons per year of each PM species. Novelis proposes the following work-practice standards as BACT for the Anodizing Test Unit to minimize emissions and ensure compliance:

- The unit will be maintained at normal operating temperatures as recommended by the manufacturer to minimize mist generation
- Novelis will maintain the sulfuric acid concentration of the Anodizing Test Unit within the manufacturer-recommended range to reduce fuming and emissions
- Novelis will conduct vendor recommended as-needed and annual maintenance activities on the unit to ensure proper operation

- **Filtering Aid Material Handling** (AS-35) – Total potential PM emissions from the filtering aid transfer process (i.e., bag dumping) are negligible (~0.001 tpy) and will be released as fugitive PM emissions into a room enclosure which is located in the main Cold Rolling production building. As part of a standard operating practice and as covered by various general duty requirements of ADEM SIP regulations concerning fugitive dust sources, Novelis will take reasonable precautions to prevent filtering aid material loss and will thereby minimize any fugitive PM emissions which may be released into the building during the filtering air transfer process from bags to the liquid surface of the mixing tanks.
- **Cold Mill Coil Marking Machine** (AS-36) - Total potential VOC emissions from ink and solvent usage in the Cold Mill Coil Marking Machine are calculated to be less than five (5) tons per year of VOC. The maximum potential ink and solvent usage rate is very low even assuming continuous operation at the maximum short-term equipment ink delivery capability. As part of standard operating procedures and consistent with general duty requirements, Novelis proposes the following work-practice standards as BACT for the Coil Marking Machine to minimize emissions and ensure compliance:
  - Storage of solvent and ink materials will be in closed containers
  - Novelis will handle inks and solvents with extreme care to minimize spills or leaks during normal operations, and any inadvertent spills will be cleaned immediately to prevent evaporation
  - Operators will be trained on the proper handling and management of VOC-containing materials
  - Novelis will utilize precision marking equipment to optimize the application process to use the minimum amount of marking material necessary to perform the intended task
  - Novelis will maintain a detailed inventory of VOC-containing materials to ensure usage and VOC-content are within the appropriate range and actual VOC emissions do not exceed calculated potential permitted rates
  - Novelis will conduct vendor recommended as-needed and annual maintenance activities on the Marking Machine to ensure proper operation
- **Mill Roll Grinding Machines** (AS-37) - Total potential emissions from three (3) Mill Roll Grinding Machines are less than five (5) tons per year of VOC. The maximum potential usage rate for coolant is very low and Novelis will utilize a low VOC-content (< 1%) cleaning fluid of only 0.09 lb/gal. Novelis proposes the following work-practice standards as BACT for the roll grinding machines to minimize emissions and ensure compliance:
  - Solvent, coolant, and oils will typically be stored in closed containers
  - Any inadvertent spills will be cleaned immediately to prevent evaporation
  - Novelis will minimize the amount of solvent used during machine cleaning and maintenance
  - Novelis will conduct vendor recommended as-needed and annual maintenance activities on the roll grinding machines to ensure proper operation
- **Coil Finishing Roll Grinding Machine** (AS-38) - Total potential PM emissions from the Coil Finishing Roll Grinding Machine are less than one (1) tons per year of each PM species. Novelis proposes the

following work-practice standards as BACT for the Coil Finishing Roll Grinding machine to minimize emissions and ensure compliance:

- Proper ventilation and good housekeeping practices will be implored to minimize the generation of dust
- Novelis will conduct vendor recommended as-needed and annual maintenance activities on the roll grinding collection system and integral cyclone/filter to ensure proper operation

- **Parts Washing Equipment** (AS-39 to AS-42) – Total potential VOC emissions from each of the process support Auxiliary Systems serving a parts washing function are less than five (5) tons per year of VOC. For the Bearings Washing Machine, Novelis will use a specialized water-based alkaline cleaning chemical at a concentration of not to exceed 10% with similar physical and chemical properties to those used in the potential VOC emission calculations. For all of the remaining parts washing equipment, the worst-case cleaning fluid usage rates are very low, and Novelis will utilize a low VOC-content (< 5%) cleaning fluid of no more than 0.20 lb/gal. Novelis proposes the following work-practice standards as BACT for the parts washers to minimize emissions and ensure compliance:
  - Parts washers will be equipped with tightly fitting covers for both working and downtime modes to minimize evaporative losses
  - Novelis will ensure parts have sufficient dwell time above the solvent bath to allow liquid solvent to vaporize and drain back into the machine before the parts are withdrawn.
  - Parts washer units will be maintained at normal operating temperatures as recommended by the manufacturer to minimize evaporative losses
  - Storage of solvent and sorbent materials will be in closed containers
  - Any spills will be cleaned immediately to prevent evaporation
  - Novelis will conduct vendor recommended as-needed and annual maintenance activities on the parts washers to ensure proper operation
- **WWTP Sources** (AS-43) – Total potential VOC emissions from all WWTP operations are negligible. Basic operating requirements for the WWTP associated with the Bay Minette facility's State Indirect Discharge (SID) permit are sufficient to ensure proper operation of the Hot Mill Oil Tanks, Cold Mill Oil Tanks, Hot Mill DAF, and Cold Mill DAF. Furthermore, the VOC emissions generating equipment in the WWTP are similar to the process support tanks in the Hot Rolling and Cold Rolling area for which ADEM has not chosen to establish any unit-specific PSD permit requirements.

As with the previously determined insignificant emissions sources, Novelis will maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions and no additional compliance requirements are warranted.

10.7 Air Quality Analysis Updates

The primary as-built changes for the process support Auxiliary Systems with the potential to influence the air quality analysis include the following items:

- Hot Baghouse Lime Silo #6 (Model ID = LMS6) has been removed from the project scope. The removal of this source does not tangibly result in a change of the combined Hot Baghouse Lime Silo $PM_{10}/PM_{2.5}$ modeled emission rates as emissions were based on a grain loading rate of 0.01 gr/dscf on the design basis of the number of bin vents used.

- Two additional Cold Baghouse Dry Sorbent Silos (Model ID = DSS1, DSS2) were added for sorbent dosing at Cold Baghouses #1-#4 and are located to the west of the Scrap Processing building (SCRPROC). Additional ancillary equipment that has been added into the as-built configuration includes the Anodizing Test Unit (ANOD) and Coil Finishing Roll Grinding Machine (RRG1). Other process equipment added (i.e., the Filtering Aid Material Handling, Mill Roll Grinding Machines, and Rubber Roll Grinding Machine) would be incorporated into respective fugitive roof vent area sources. Emission units where VOC is the only pollutant (i.e., parts washers), are not subject to direct representation in an air dispersion model and as such, are not required to be included in the AERMOD-based Class II modeling infrastructure for the Bay Minette facility in either the as-permitted or as-built modeling demonstration (refer to Ozone Ambient Impact Analysis in Section 6 of the as-built modeling report addressing all sources of VOC emissions as an ozone precursor).
    - Any potential modeled $PM_{10}/PM_{2.5}$ emissions rate increases and associated modeled $PM_{10}/PM_{2.5}$ impact changes from the addition of these units are expected to be insignificant and are expected to be offset by more substantial changes described in the previous sections.

APPENDIX A. FACILITY EMISSION UNIT INVENTORY, PLOT/SITE PLANS AND BACT LIMIT SUMMARY

1. Novelis Bay Minette - Emission Unit Index

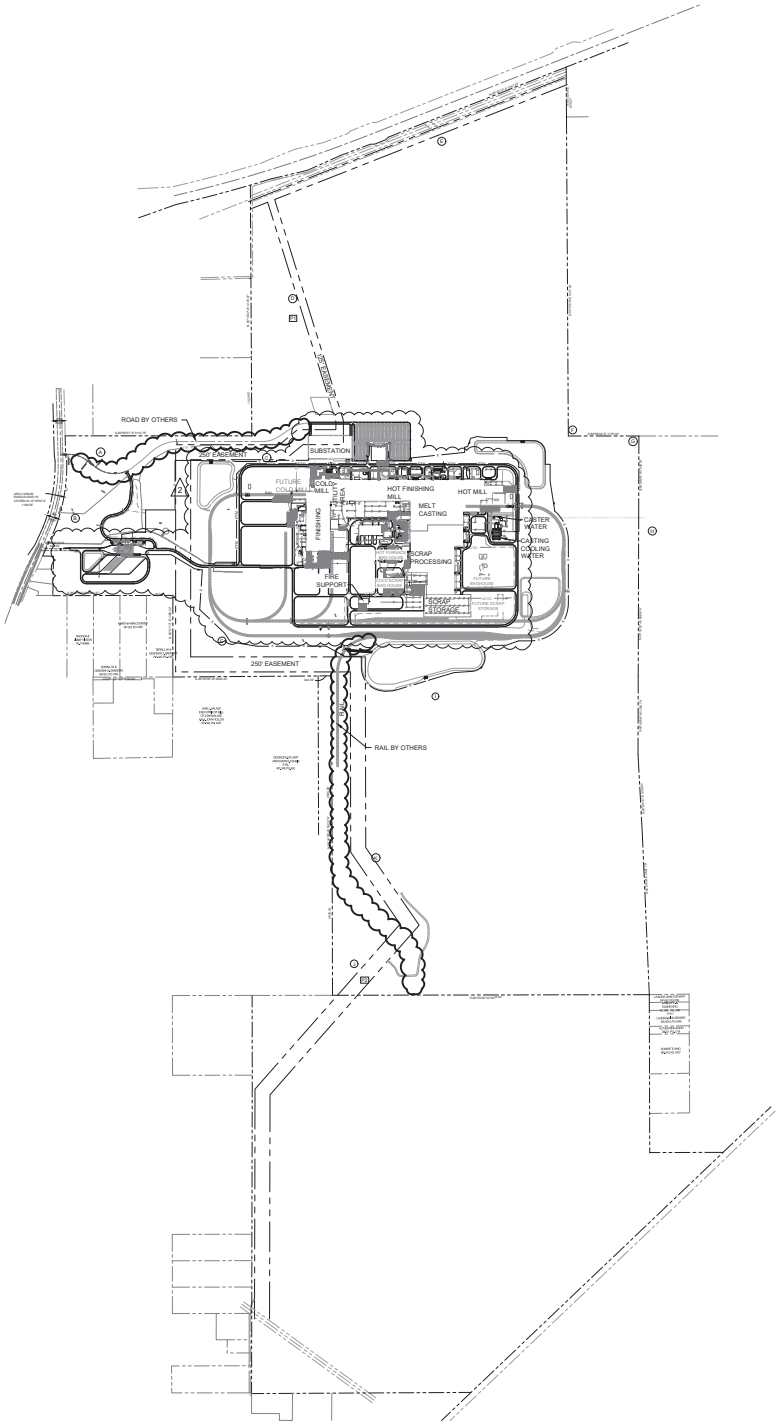
The following table provides an index of emission units that are referenced in the emission calculations and on air permit application forms.

Plant Area	Air Const. Permit No.	Air Permit Source ID	Process ID	Emission Unit Description	Process Description	Control Device ID	Control Device Description	Plant Stack ID	Stack Description
01. Scrap Processing	X001	SP-01	1	Scrap Processing Line #1 (Flex Line)	Aluminum Production	CBH1	Cold Baghouse #1	S-SP-01	Cold Baghouse #1 Stack
01. Scrap Processing	X002	SP-02	1	Scrap Processing Line #2 (CBS Line - UBC)	Aluminum Production	CBH2	Cold Baghouse #2	S-SP-02	Cold Baghouse #2 Stack
01. Scrap Processing	X002	SP-03	1	Scrap Processing Line #3 (CBS Line - Class 1 & 3)	Aluminum Production	CBH3	Cold Baghouse #3	S-SP-03	Cold Baghouse #3 Stack
~~01. Scrap Processing~~	~~X001~~	~~SP-04~~	~~1~~	~~Scrap Processing Line #4 (LIBS Line)~~	~~Aluminum Production~~	~~CBH4~~	~~Cold Baghouse #4~~	~~S-SP-04~~	~~Cold Baghouse #4 Stack~~
01. Scrap Processing	X001	SP-05	1	Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line)	Aluminum Production	**CBH4**	**Cold Baghouse #4**	S-SP-05	**Cold Baghouse #4 Stack**
02. Melting and Casting	X003	MC-01	1	**Decoater #3 (Flex Line)**	Aluminum Production	HBH1	Hot Baghouse #1	S-MC-01	Hot Baghouse #1 Stack
02. Melting and Casting	X003	MC-01	2	**Decoater #3 (Flex Line)**	Natural Gas Usage	HBH1	Hot Baghouse #1	S-MC-01	Hot Baghouse #1 Stack
02. Melting and Casting	X004	MC-02	1	Decoater #2 (CBS Line)	Aluminum Production	HBH2	Hot Baghouse #2	S-MC-01	Hot Baghouse #2 Stack
02. Melting and Casting	X004	MC-02	2	Decoater #2 (CBS Line)	Natural Gas Usage	HBH2	Hot Baghouse #2	S-MC-01	Hot Baghouse #2 Stack
02. Melting and Casting	X005	MC-03	1	**Decoater #1 (CBS Line)**	Aluminum Production	HBH3	Hot Baghouse #3	S-MC-01	Hot Baghouse #3 Stack
02. Melting and Casting	X005	MC-03	2	**Decoater #1 (CBS Line)**	Natural Gas Usage	HBH3	Hot Baghouse #3	S-MC-01	Hot Baghouse #3 Stack
02. Melting and Casting	X006	MC-04	1	**Sidewell Melting Furnace #5 (Flex Line)**	Aluminum Production	HBH4	Hot Baghouse #4	S-MC-01	Hot Baghouse #4 Stack
02. Melting and Casting	X006	MC-04	2	**Sidewell Melting Furnace #5 (Flex Line)**	Natural Gas Usage	HBH4	Hot Baghouse #4	S-MC-01	Hot Baghouse #4 Stack
02. Melting and Casting	X006	MC-05	1	**Sidewell Melting Furnace #4 (Flex Line)**	Aluminum Production	HBH4	Hot Baghouse #4	S-MC-01	Hot Baghouse #4 Stack
02. Melting and Casting	X006	MC-05	2	**Sidewell Melting Furnace #4 (Flex Line)**	Natural Gas Usage	HBH4	Hot Baghouse #4	S-MC-01	Hot Baghouse #4 Stack
02. Melting and Casting	X007	MC-06	1	**Sidewell Melting Furnace #2 (CBS Line)**	Aluminum Production	HBH5	Hot Baghouse #5	S-MC-01	Hot Baghouse #5 Stack
02. Melting and Casting	X007	MC-06	2	**Sidewell Melting Furnace #2 (CBS Line)**	Natural Gas Usage	HBH5	Hot Baghouse #5	S-MC-01	Hot Baghouse #5 Stack
02. Melting and Casting	X007	MC-07	1	**Sidewell Melting Furnace #1 (CBS Line)**	Aluminum Production	HBH5	Hot Baghouse #5	S-MC-01	Hot Baghouse #5 Stack
02. Melting and Casting	X007	MC-07	2	**Sidewell Melting Furnace #1 (CBS Line)**	Natural Gas Usage	HBH5	Hot Baghouse #5	S-MC-01	Hot Baghouse #5 Stack
02. Melting and Casting	X008	MC-08	1	**Sidewell Melting Furnace #3 (CBS Line)**	Aluminum Production	HBH6	Hot Baghouse #6	S-MC-02	Hot Baghouse #6 Stack
02. Melting and Casting	X008	MC-08	2	**Sidewell Melting Furnace #3 (CBS Line)**	Natural Gas Usage	HBH6	Hot Baghouse #6	S-MC-02	Hot Baghouse #6 Stack
02. Melting and Casting	X009	MC-09	1	Novelis Dual Chamber (NDC) Recycle Furnace #1 (Flex Line)	Aluminum Production	HBH7	Hot Baghouse #7	S-MC-02	Hot Baghouse #7 Stack
02. Melting and Casting	X009	MC-09	2	Novelis Dual Chamber (NDC) Recycle Furnace #1 (Flex Line)	Natural Gas Usage	HBH7	Hot Baghouse #7	S-MC-02	Hot Baghouse #7 Stack
02. Melting and Casting	X010	MC-10	1	**Round Top Furnace #2 (Flex Line)**	Aluminum Production	HBH8	Hot Baghouse #8	S-MC-02	Hot Baghouse #8 Stack
02. Melting and Casting	X010	MC-10	2	**Round Top Furnace #2 (Flex Line)**	Natural Gas Usage	HBH8	Hot Baghouse #8	S-MC-02	Hot Baghouse #8 Stack
02. Melting and Casting	X011	MC-11	1	**Round Top Furnace #1 (CBS Line)**	Aluminum Production	HBH9	Hot Baghouse #9	S-MC-02	Hot Baghouse #9 Stack
02. Melting and Casting	X011	MC-11	2	**Round Top Furnace #1 (CBS Line)**	Natural Gas Usage	HBH9	Hot Baghouse #9	S-MC-02	Hot Baghouse #9 Stack
02. Melting and Casting	**X010**	MC-12	1	**Holding Furnace #4 (Flex Line)**	Aluminum Production	**HBH8**	**Hot Baghouse #8**	S-MC-02	**Hot Baghouse #8 Stack**
02. Melting and Casting	**X010**	MC-12	2	**Holding Furnace #4 (Flex Line)**	Natural Gas Usage	**HBH8**	**Hot Baghouse #8**	S-MC-02	**Hot Baghouse #8 Stack**
02. Melting and Casting	**X009**	MC-13	1	**Holding Furnace #3 (Flex Line)**	Aluminum Production	**HBH7**	**Hot Baghouse #7**	S-MC-02	**Hot Baghouse #7 Stack**
02. Melting and Casting	**X009**	MC-13	2	**Holding Furnace #3 (Flex Line)**	Natural Gas Usage	**HBH7**	**Hot Baghouse #7**	S-MC-02	**Hot Baghouse #7 Stack**
02. Melting and Casting	**X008**	MC-14	1	**Holding Furnace #2 (CBS Line)**	Aluminum Production	**HBH6**	**Hot Baghouse #6**	S-MC-02	**Hot Baghouse #6 Stack**
02. Melting and Casting	**X008**	MC-14	2	**Holding Furnace #2 (CBS Line)**	Natural Gas Usage	**HBH6**	**Hot Baghouse #6**	S-MC-02	**Hot Baghouse #6 Stack**
02. Melting and Casting	**X011**	MC-15	1	**Holding Furnace #1 (CBS Line)**	Aluminum Production	**HBH9**	**Hot Baghouse #9**	S-MC-02	**Hot Baghouse #9 Stack**
02. Melting and Casting	**X011**	MC-15	2	**Holding Furnace #1 (CBS Line)**	Natural Gas Usage	**HBH9**	**Hot Baghouse #9**	S-MC-02	**Hot Baghouse #9 Stack**
02. Melting and Casting	**X010**	MC-16	1	**In-Line Degasser #4 (Flex Line)**	Aluminum Production	**HBH8**	**Hot Baghouse #8**	S-MC-02	**Hot Baghouse #8 Stack**
02. Melting and Casting	**X009**	**MC-33**	**1**	**In-Line Degasser #3 (Flex Line)**	**Aluminum Production**	**HBH7**	**Hot Baghouse #7**	**S-MC-02**	**Hot Baghouse #7 Stack**
02. Melting and Casting	**X008**	MC-17	1	**In-Line Degasser #2 (CBS Line)**	Aluminum Production	**HBH6**	**Hot Baghouse #6**	S-MC-02	**Hot Baghouse #6 Stack**
02. Melting and Casting	**X011**	MC-18	1	**In-Line Degasser #1 (CBS Line)**	Aluminum Production	**HBH9**	**Hot Baghouse #9**	S-MC-02	**Hot Baghouse #9 Stack**
02. Melting and Casting	X006	MC-19	1	**Sow Dryer #2 (Flex Line)**	Natural Gas Usage	na	na	S-MC-03	**Sow Dryer #2 Stack**
02. Melting and Casting	X007	MC-20	1	**Sow Dryer #1 (CBS Line)**	Natural Gas Usage	na	na	S-MC-04	**Sow Dryer #1 Stack**
02. Melting and Casting	X004	MC-21	1	Dross House	Dross Processed	HBH2	Hot Baghouse #2	S-MC-01	Hot Baghouse #2 Stack

Plant Area	Air Const. Permit No.	Air Permit Source ID	Process ID	Emission Unit Description	Process Description	Control Device ID	Control Device Description	Plant Stack ID	Stack Description
02. Melting and Casting	X009	MC-22	1	**Dross Press #2 (Flex Line)**	Dross Processed	**DPBH1**	**Dross Press #1 Filtration Unit #1**	**na**	**Melting & Casting Building Fugitives**
~~02. Melting and Casting~~	~~X009~~	~~MC-23~~	~~1~~	~~Dross Press #2 (Flex Line)~~	~~Dross Processed~~	~~HBH7~~	~~Hot Baghouse #7~~	~~S-MC-02~~	~~Hot Baghouse #7 Stack~~
02. Melting and Casting	X008	MC-24	1	**Dross Press #1 (CBS Line)**	Dross Processed	**DPBH2**	**Dross Press #2 Filtration Unit #2**	**na**	**Melting & Casting Building Fugitives**
~~02. Melting and Casting~~	~~X008~~	~~MC-25~~	~~1~~	~~Dross Press #4 (CBS Line)~~	~~Dross Processed~~	~~HBH6~~	~~Hot Baghouse #6~~	~~S-MC-02~~	~~Hot Baghouse #6 Stack~~
02. Melting and Casting	Insign.	MC-26	1	**Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC4 (Flex Line)**	Natural Gas Usage	na	na	na	Melting & Casting Building Fugitives
02. Melting and Casting	**Insign.**	**MC-34**	**1**	**Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC3 (Flex Line)**	**Natural Gas Usage**	**na**	**na**	**na**	**Melting & Casting Building Fugitives**
02. Melting and Casting	Insign.	MC-27	1	**Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC2 (CBS Line)**	Natural Gas Usage	na	na	na	Melting & Casting Building Fugitives
02. Melting and Casting	Insign.	MC-28	1	**Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC1 (CBS Line)**	Natural Gas Usage	na	na	na	Melting & Casting Building Fugitives
~~02. Melting and Casting~~	~~Insign.~~	~~MC-29~~	~~1~~	~~Trough Heaters (Flex Line)~~	~~Natural Gas Usage~~	~~na~~	~~na~~	~~na~~	~~Melting & Casting Building Fugitives~~
~~02. Melting and Casting~~	~~Insign.~~	~~MC-30~~	~~1~~	~~Trough Heaters (CBS Line)~~	~~Natural Gas Usage~~	~~na~~	~~na~~	~~na~~	~~Melting & Casting Building Fugitives~~
02. Melting and Casting	**Insign.**	**MC-35**	**1**	**Molten Metal Utility Heaters**	**Natural Gas Usage**	**na**	**na**	**na**	**Melting & Casting Building Fugitives**
02. Melting and Casting	Insign.	MC-31	1	**DC1-DC4 Casting Unit- Lubricant Usage**	Lubricant Usage	na	na	na	Melting & Casting Building Fugitives
02. Melting and Casting	X012	MC-32	1	Melting & Casting Ingot Saw	Aluminum Production	FLT1	Filtration Unit #1	na	Melting & Casting Building Fugitives
~~03. Hot Rolling~~	~~X012~~	~~HR-01~~	~~1~~	~~Hot Rolling Ingot Saws (4)~~	~~Aluminum Production~~	~~FLT2/3~~	~~Filtration Units #2/#3~~	~~na~~	~~Mill Building Fugitives~~
03. Hot Rolling	X013	HR-02	1	Scalper #1	Aluminum Production	FLT4	Filtration Unit #4	S-HR-01	Scalper #1 Filtration Unit Stack
03. Hot Rolling	X013	HR-03	1	**Scalper Chip Handling System Pneumatic Conveyor for Briquetter**	Aluminum Production	na	na	S-HR-02	**Scalper Chip Handling System Pneumatic Conveyor for Briquetter Cyclone Stack**
~~03. Hot Rolling~~	~~X013~~	~~HR-04~~	~~1~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #2 (Flex Line)~~	~~Aluminum Production~~	~~na~~	~~na~~	~~S-HR-03~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #2 (Flex Line) Cyclone Stack~~
~~03. Hot Rolling~~	~~X013~~	~~HR-05~~	~~1~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #3 (CBS Line)~~	~~Aluminum Production~~	~~na~~	~~na~~	~~S-HR-04~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #3 (CBS Line) Cyclone Stack~~
~~03. Hot Rolling~~	~~X013~~	~~HR-06~~	~~1~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #4 (CBS Line)~~	~~Aluminum Production~~	~~na~~	~~na~~	~~S-HR-05~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #4 (CBS Line) Cyclone Stack~~
03. Hot Rolling	X014	HR-07	1	Pusher Furnace #1	Aluminum Production	na	na	S-HR-06	Pusher Furnace #1 Stack
03. Hot Rolling	X014	HR-07	2	Pusher Furnace #1	Natural Gas Usage	na	na	S-HR-06	Pusher Furnace #1 Stack
03. Hot Rolling	X014	HR-08	1	Pusher Furnace #2	Aluminum Production	na	na	S-HR-07	Pusher Furnace #2 Stack
03. Hot Rolling	X014	HR-08	2	Pusher Furnace #2	Natural Gas Usage	na	na	S-HR-07	Pusher Furnace #2 Stack
03. Hot Rolling	X014	HR-09	1	Pusher Furnace #3	Aluminum Production	na	na	S-HR-08	Pusher Furnace #3 Stack
03. Hot Rolling	X014	HR-09	2	Pusher Furnace #3	Natural Gas Usage	na	na	S-HR-08	Pusher Furnace #3 Stack
03. Hot Rolling	X015	HR-10	1	Hot Reversing Mill	Aluminum Production	ME1	Mist Eliminator #1	S-HR-09	Hot Reversing Mill Stack
03. Hot Rolling	X015	HR-10	2	Hot Reversing Mill	Aluminum Production Uncaptured	na	na	na	Mill Building Roof Vent Fugitives
03. Hot Rolling	X016	HR-11	1	Hot Finishing Mill	Aluminum Production	ME2	Mist Eliminator #2	S-HR-10	Hot Finishing Mill Stack
03. Hot Rolling	X016	HR-11	2	Hot Finishing Mill	Aluminum Production Uncaptured	na	na	na	Mill Building Roof Vent Fugitives
04. Cold Rolling	X017	CR-01	1	Tandem Cold Mill #1	Aluminum Production	CND1/ME3	Condenser #1 and Mist Eliminator #3	S-CR-01	Tandem Cold Mill #1 Stack
04. Cold Rolling	X017	CR-01	2	Tandem Cold Mill #1	Aluminum Production Uncaptured	na	na	na	Mill Building Roof Vent Fugitives
05. Coil Finishing	X018	CF-01	1	Tension Leveler (Can Coating Line)	Lubricant Usage	na	na	na	Tension Leveler (Can Coating Line)
05. Coil Finishing	X018	CF-02	1	Alkaline Cleaning Line #1 (Can Coating Line)	Strip Area Processed	SC1	Demister/Scrubber #1	S-CF-01	Alkaline Cleaning Line #1 (Can Coating Line) Scrubber Stack
05. Coil Finishing	X018	CF-03	1	Coating Line #1	Aluminum Production	RTO1	Regenerative Thermal Oxidizer (RTO) #1	S-CF-02	Coating Line #1 RTO Stack
05. Coil Finishing	X018	CF-03	2	Coating Line #1	Natural Gas Usage	RTO1	Regenerative Thermal Oxidizer (RTO) #1	S-CF-02	Coating Line #1 RTO Stack

Plant Area	Air Const. Permit No.	Air Permit Source ID	Process ID	Emission Unit Description	Process Description	Control Device ID	Control Device Description	Plant Stack ID	Stack Description
05. Coil Finishing	TBD	CF-04	1	Edge Trimmer- Electrostatic Oiler	Strip Area Processed	na	na	na	Coil Finishing Building Roof Vent Fugitives
05. Coil Finishing	TBD	CF-05	1	Edge Trimmer- Scrap Baller	Aluminum Production	SC2	Demister/Scrubber #2	S-CF-04	Edge Trimmer- Scrap Baller Scrubber Stack
~~06. Auxiliary Systems~~	~~X019~~	~~AS-01~~	~~1~~	~~Hot Water Boiler #1~~	~~Natural Gas Usage~~	~~na~~	~~na~~	~~S-AS-01~~	~~Hot Water Boiler #1 Stack~~
~~06. Auxiliary Systems~~	~~X019~~	~~AS-02~~	~~1~~	~~Hot Water Boiler #2~~	~~Natural Gas Usage~~	~~na~~	~~na~~	~~S-AS-02~~	~~Hot Water Boiler #2 Stack~~
~~06. Auxiliary Systems~~	~~X019~~	~~AS-03~~	~~1~~	~~Hot Water Boiler #3~~	~~Natural Gas Usage~~	~~na~~	~~na~~	~~S-AS-03~~	~~Hot Water Boiler #3 Stack~~
06. Auxiliary Systems	X020	AS-04	1	Caster Cooling Tower #1	Circulating Water	na	na	S-AS-04_1 to S-AS-04_6	Caster Cooling Tower #1 Cells 1-6 Stacks
06. Auxiliary Systems	X020	AS-05	1	Hot Mill Cooling Tower	Circulating Water	na	na	S-AS-05_1 to S_AS-05_6	Hot Mill Cooling Tower Cells 1-6 Stacks
06. Auxiliary Systems	X021	AS-06	1	Emergency Generator Engine #1 (Security Office)	Natural Gas Usage	na	na	S-AS-06	Emergency Generator Engine #1 (Security Office) Stack
06. Auxiliary Systems	X021	AS-07	1	Emergency Generator Engine #2 (Admin. Building)	Natural Gas Usage	na	na	S-AS-07	Emergency Generator Engine #2 (Admin. Building) Stack
~~06. Auxiliary Systems~~	~~X021~~	~~AS-08~~	~~1~~	~~Emergency Generator Engine #3 (Remelt- Cold End)~~	~~Natural Gas Usage~~	~~na~~	~~na~~	~~S-AS-116~~	~~Emergency Generator Engine #3 (Remelt- Cold End) Stack~~
~~06. Auxiliary Systems~~	~~X021~~	~~AS-09~~	~~1~~	~~Emergency Generator Engine #4 (Remelt- Hot End)~~	~~Natural Gas Usage~~	~~na~~	~~na~~	~~S-AS-117~~	~~Emergency Generator Engine #4 (Remelt- Hot End) Stack~~
06. Auxiliary Systems	X021	AS-10	1	Emergency Generator Engine #5 (Hot Reversing Mill)	Natural Gas Usage	na	na	S-AS-10	Emergency Generator Engine #5 (Hot Reversing Mill) Stack
06. Auxiliary Systems	X021	AS-11	1	Emergency Generator Engine #6 (Hot Finishing Mill)	Natural Gas Usage	na	na	S-AS-11	Emergency Generator Engine #6 (Hot Finishing Mill) Stack
06. Auxiliary Systems	X021	AS-12	1	Emergency Generator Engine #7 (Cold Mill)	Natural Gas Usage	na	na	S-AS-12	Emergency Generator Engine #7 (Cold Mill) Stack
~~06. Auxiliary Systems~~	~~X021~~	~~AS-13~~	~~1~~	~~Emergency Generator Engine #8 (Coating Line)~~	~~Natural Gas Usage~~	~~na~~	~~na~~	~~S-AS-121~~	~~Emergency Generator Engine #8 (Coating Line) Stack~~
~~06. Auxiliary Systems~~	~~X021~~	~~AS-14~~	~~1~~	~~Emergency Generator Engine #9 (Edge Trimmer)~~	~~Natural Gas Usage~~	~~na~~	~~na~~	~~S-AS-122~~	~~Emergency Generator Engine #9 (Edge Trimmer) Stack~~
06. Auxiliary Systems	X021	AS-15	1	Fire Pump Engine #1 (North Pump House)	Diesel Usage	na	na	S-AS-15	Fire Pump Engine #1 (North Pump House) Stack
~~06. Auxiliary Systems~~	~~X021~~	~~AS-16~~	~~1~~	~~Fire Pump Engine #2 (South Pump House)~~	~~Diesel Usage~~	~~na~~	~~na~~	~~S-AS-124~~	~~Fire Pump Engine #2 (South Pump House) Stack~~
06. Auxiliary Systems	X021	AS-17	1	Fire Pump Engine #3 (West Pump House)	Diesel Usage	na	na	S-AS-17	Fire Pump Engine #3 (West Pump House) Stack
06. Auxiliary Systems	X021	AS-18	1	Fire Pump Engine #4 (West Pump House)	Diesel Usage	na	na	S-AS-18	Fire Pump Engine #4 (West Pump House) Stack
06. Auxiliary Systems	TBD	AS-19a	1	Building Heating Systems (30 MAU @ 11.55 MMBtu/hr Each)	Natural Gas Usage	na	na	na	Heating System Vents
06. Auxiliary Systems	TBD	AS-19b	1	Building Heating Systems (4 MAU @ 7.50 MMBtu/hr Each)	Natural Gas Usage	na	na	na	Heating System Vents
06. Auxiliary Systems	TBD	AS-19c	1	Building Heating Systems (2 MAU @ 3.75 MMBtu/hr Each)	Natural Gas Usage	na	na	na	Heating System Vents
06. Auxiliary Systems	TBD	AS-19d	1	Building Heating Systems (1 MAU @ 2.25 MMBtu/hr Each)	Natural Gas Usage	na	na	na	Heating System Vents
06. Auxiliary Systems	TBD	AS-19e	1	Building Heating Systems (7 @ 0.175 MMBtu/hr Each)	Natural Gas Usage	na	na	na	Heating System Vents
06. Auxiliary Systems	TBD	AS-19f	1	Building Heating Systems (12 @ 0.150 MMBtu/hr Each)	Natural Gas Usage	na	na	na	Heating System Vents
06. Auxiliary Systems	TBD	AS-19g	1	Building Heating Systems (6 @ 0.105 MMBtu/hr Each)	Natural Gas Usage	na	na	na	Heating System Vents
06. Auxiliary Systems	TBD	AS-19h	1	Building Heating Systems (4 @ 0.045 MMBtu/hr Each)	Natural Gas Usage	na	na	na	Heating System Vents
06. Auxiliary Systems	Insign.	AS-20	1	Hot Baghouses Lime Silos (5)	Lime Processed	na	na	S-AS-20_1 to AS-20_5	Hot Baghouses Lime Silo Integral Filter Vents
06. Auxiliary Systems	Insign.	AS-33	1	Cold Baghouse Dry Sorbent Silos (2)	Dry Sorbent Processed	na	na	S-AS-33_1 to AS-33_2	Cold Baghouses Dry Sorbent Silo Integral Filter Vents
06. Auxiliary Systems	Insign.	AS-21	1	Diesel Fuel Storage and Refueling Stations (4)	Diesel Usage - Standing Losses	na	na	na	Diesel Fuel Storage and Refueling Stations (4)
06. Auxiliary Systems	Insign.	AS-21	2	Diesel Fuel Storage and Refueling Stations (4)	Diesel Usage - Working Losses	na	na	na	Diesel Fuel Storage and Refueling Stations (4)
06. Auxiliary Systems	Insign.	AS-21	3	Diesel Fuel Storage and Refueling Stations (4)	Diesel Usage - Loading Losses	na	na	na	Diesel Fuel Storage and Refueling Stations (4)
06. Auxiliary Systems	Insign.	AS-22	1	Hot Rolling Area Storage Tanks (14)	Rolling Oil/Coolant Usage - Standing Losses	na	na	na	Hot Rolling Area Storage Tanks (14)
06. Auxiliary Systems	Insign.	AS-22	2	Hot Rolling Area Storage Tanks (14)	Rolling Oil/Coolant Usage - Working Losses	na	na	na	Hot Rolling Area Storage Tanks (14)
06. Auxiliary Systems	Insign.	AS-23	1	Cold Rolling Area Storage Tanks (13)	Rolling Oil/Coolant Usage - Standing Losses	na	na	na	Cold Rolling Area Storage Tanks (13)
06. Auxiliary Systems	Insign.	AS-23	2	Cold Rolling Area Storage Tanks (13)	Rolling Oil/Coolant Usage - Working Losses	na	na	na	Cold Rolling Area Storage Tanks (13)
06. Auxiliary Systems	Insign.	AS-24	1	Coil Finishing Area Storage Tanks (22)	Coatings/Solvent Usage - Standing Losses	na	na	na	Coil Finishing Area Storage Tanks (22)

Plant Area	Air Const. Permit No.	Air Permit Source ID	Process ID	Emission Unit Description	Process Description	Control Device ID	Control Device Description	Plant Stack ID	Stack Description
06. Auxiliary Systems	Insign.	AS-24	2	Coil Finishing Area Storage Tanks (22)	Coatings/Solvent Usage - Working Losses	na	na	na	Coil Finishing Area Storage Tanks (22)
06. Auxiliary Systems	X022	AS-25	1	Paved Haul Roads	Vehicle Miles Traveled	SW	Periodic Sweeping	na	Paved Haul Roads
06. Auxiliary Systems	X020	AS-26	1	Cold Mill Cooling Tower	Circulating Water	na	na	AS-26_1 to AS-26_4	Cold Mill Cooling Tower Cells 1-4 Stacks
06. Auxiliary Systems	X020	AS-27	1	Finishing Cooling Tower	Circulating Water	na	na	AS-27_1 to AS-27_2	Finishing Cooling Tower Cells 1-2 Stacks
06. Auxiliary Systems	X020	AS-28	1	Round Tops/Pushers Cooling Tower	Circulating Water	na	na	AS-28_1 to AS-28_2	Round Tops/Pushers Cooling Tower Cells 1-2 Stacks
06. Auxiliary Systems	X021	AS-29	1	Emergency Generator Engine #10 (Maintenance Bldg)	Natural Gas Usage	na	na	S-AS-29	Emergency Generator Engine #10 (Maintenance Bldg)
06. Auxiliary Systems	X021	AS-30	1	Emergency Generator Engine #11 (Decoater #1)	Natural Gas Usage	na	na	na	Melting & Casting Building Fugitives
06. Auxiliary Systems	X021	AS-31	1	Emergency Generator Engine #12 (Decoater #2)	Natural Gas Usage	na	na	na	Melting & Casting Building Fugitives
06. Auxiliary Systems	X021	AS-32	1	Emergency Generator Engine #13 (Decoater #3)	Natural Gas Usage	na	na	na	Melting & Casting Building Fugitives
06. Auxiliary Systems	Insign.	AS-34	1	Anodizing Test Unit	Aluminum Production	ANODS	Anodizing Room Scrubber	S-AS-34	Anodizing Room Scrubber Stack
06. Auxiliary Systems	Insign.	AS-35	1	Filtering Aid Material Handling	Filter Aid Usage	na	na	na	Cold Mill Building Fugitives
06. Auxiliary Systems	Insign.	AS-36	1	Cold Mill Coil Marking Machine	Coatings/Solvent Usage	na	na	na	Cold Mill Building Fugitives
06. Auxiliary Systems	Insign.	AS-37	1	Mill Roll Grinding Machines (3)	Roll Grinding Events	na	na	na	Roll Shop Building Fugitives
06. Auxiliary Systems	Insign.	AS-38	1	Coil Finishing Roll Grinding Machine	Roll Grinding Events	CFRGCF	Coil Finishing Roll Grinder Cyclone/Filter	S-AS-38	Coil Finishing Roll Grinding Machine Filtration Unit Stack
06. Auxiliary Systems	Insign.	AS-39	1	Bearings Washing Machine	Solvent Usage	BWDM	Bearings Washer Demister	na	Roll Shop Building Fugitives
06. Auxiliary Systems	Insign.	AS-40	1	Hot Mill Parts Washing Bay	Solvent Usage	na	na	na	Hot Mill Building Fugitives
06. Auxiliary Systems	Insign.	AS-41	1	Roll Shop Parts Washers (4)	Solvent Usage	na	na	na	Roll Shop Building Fugitives
06. Auxiliary Systems	Insign.	AS-42	1	Maintenance Parts Washers (7)	Solvent Usage	na	na	na	Various Building Fugitives
06. Auxiliary Systems	Insign.	AS-43a	1	WWTP- Hot Mill Oil Tanks (2)	Rolling Oil/Coolant - Standing Losses	na	na	na	WWTP Building Fugitives
06. Auxiliary Systems	Insign.	AS-43a	2	WWTP- Hot Mill Oil Tanks (2)	Rolling Oil/Coolant - Working Losses	na	na	na	WWTP Building Fugitives
06. Auxiliary Systems	Insign.	AS-43b	1	WWTP- Cold Mill Oil Tank	Rolling Oil/Coolant - Standing Losses	na	na	na	WWTP Building Fugitives
06. Auxiliary Systems	Insign.	AS-43b	2	WWTP- Cold Mill Oil Tank	Rolling Oil/Coolant - Working Losses	na	na	na	WWTP Building Fugitives
06. Auxiliary Systems	Insign.	AS-43c	1	WWTP- Hot Mill DAF	Wastewater Processed	na	na	na	WWTP Building Fugitives
06. Auxiliary Systems	Insign.	AS-43d	1	WWTP- Cold Mill DAF	Wastewater Processed	na	na	na	WWTP Building Fugitives



N

0 800' 1600' 2400'

SCALE: 1"=800'-0"

CWP
M-2401-0110-39-F-CG
M-2402-0210-39-F-CG
M-2403-0310-39-F-CG

LICENSED 08/29/2025 No. 32983 PROFESSIONAL ENGINEER STATE OF ALABAMA

FLUOR ENTERPRISES, INC.

FLUOR PROJECT NO. 448GD

DRAWN BY: B.SWANN	08/18/2022	Novelis Corporation BAY MINETTE PLANT, AL
APPROVED BY: C.TAYLOR	08/18/2022	PLANT NO 1229
TOLERANCES		PROJECT GOLDENEYE
ANGLE ± 0°, 30'	FRACTIONAL ± 1/32	DESCRIPTION CIVIL OVERALL SITE PLAN
DECIMAL .XX ± .03 .XXX ± .010 .XXXX ± .0052	METRIC .X ± 1 .XX ± .25 .XXX ± .025	DRAWING 1290-2401-CV-PLN-0102 REV 2
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DO NOT SCALE DRAWING	SIZE E SCALE 1"=800' SHEET 1 OF 1
	FINISH RMS - U.O.S.	

PLOT DATE: P:\CAD\2YR_DWG files Marietta\1290-2401-CV-PLN-0102.dwg 08-29-25 12:37 pm Printed By: dan10720

Table A-1. Summary of PM/PM10/PM2.5 BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Scrap Processing Line #1	SP-01	CBH1	X001	3	5.67	5.66	-0.23%	lb PM/hr	Baghouse stack only BACT limits from exit grain loading design basis for Cold Baghouse #1 and EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios	High-Efficiency Lime-Injected Baghouse & Good Design and Operating Practices	N/A
				7	2.89	2.89	--	lb PM_{10}/hr			
				8	0.85	0.85	--	lb $PM_{2.5}$/hr			
Scrap Processing Line #2	SP-02	CBH2	X002	3	5.31	5.31	--	lb PM/hr	Baghouse stack only BACT limits from exit grain loading design basis for Cold Baghouse #2 and EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios	High-Efficiency Lime-Injected Baghouse & Good Design and Operating Practices	N/A
				6	2.71	2.71	--	lb PM_{10}/hr			
				7	0.80	0.80	--	lb $PM_{2.5}$/hr			
Scrap Processing Line #3	SP-03	CBH3	X002	4	1.63	2.07	27.0%	lb PM/hr	Baghouse stack only BACT limits from exit grain loading design basis for Cold Baghouse #3 and EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios	High-Efficiency Lime-Injected Baghouse & Good Design and Operating Practices	N/A
				8	0.83	1.06	27.2%	lb PM_{10}/hr			
				9	0.24	0.31	29.4%	lb $PM_{2.5}$/hr			
~~Scrap Processing Line #4~~	~~SP-04~~	~~CBH4~~	~~X001~~	~~4~~	~~1.38~~	~~--~~	~~--~~	~~lb PM/hr~~	~~Baghouse stack only BACT limits from exit grain loading design basis for Cold Baghouse #4 and EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios~~	~~High-Efficiency Lime-Injected Baghouse & Good Design and Operating Practices~~	~~N/A~~
				~~9~~	~~0.70~~	~~--~~	~~--~~	~~lb PM_{10}/hr~~			
				~~10~~	~~0.21~~	~~--~~	~~--~~	~~lb $PM_{2.5}$/hr~~			
Scrap Sorting Line #1	SP-05	**CBH4**	X001	5	1.90	1.89	-0.75%	lb PM/hr	Baghouse stack only BACT limits from exit grain loading design basis for Cold Baghouse #5 and EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios	High-Efficiency Baghouse & Good Design and Operating Practices	N/A
				11	0.97	0.96	-0.85%	lb PM_{10}/hr			
				12	0.28	0.28	--	lb $PM_{2.5}$/hr			
Decoater #3	MC-01	HBH1	X003	3	1.59	1.62	1.68%	lb PM/hr	Baghouse stack only BACT limits from exit grain loading design basis for Hot Baghouse #1, EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of six (6) tested condensable PM (CPM) emission factors at 95% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				5	5.72	5.36	-6.36%	lb PM_{10}/hr			
				6	5.56	5.19	-6.58%	lb $PM_{2.5}$/hr			
Decoater #2	MC-02	HBH2	X004	5	0.91	0.96	6.04%	lb PM/hr	Baghouse stack only BACT limits from exit grain loading design basis for Hot Baghouse #2, EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of six (6) tested condensable PM (CPM) emission factors at 95% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				9	5.09	4.76	-6.55%	lb PM_{10}/hr			
				10	5.00	4.66	-6.80%	lb $PM_{2.5}$/hr			
Decoater #1	MC-03	HBH3	X005	3	1.59	1.69	6.20%	lb PM/hr	Baghouse stack only BACT limits from exit grain loading design basis for Hot Baghouse #3, EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of six (6) tested condensable PM (CPM) emission factors at 95% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				5	5.72	5.42	-5.21%	lb PM_{10}/hr			
				6	5.56	5.25	-5.52%	lb $PM_{2.5}$/hr			

Table A-1. Summary of PM/PM10/PM2.5 BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Sidewell Melting Furnace #5	MC-04	HBH4	X006	5	0.048	0.049	1.59%	lb PM/ton	Exit grain loading design basis for Hot Baghouse #4, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of nine (9) tested condensable PM (CPM) emission factors at 95% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				8	0.160	0.160	--	lb PM_{10}/ton			
				9	0.143	0.143	--	lb $PM_{2.5}$/ton			
Sidewell Melting Furnace #4	MC-05	HBH4	X006	5	0.048	0.049	1.59%	lb PM/ton	Exit grain loading design basis for Hot Baghouse #4, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of nine (9) tested condensable PM (CPM) emission factors at 95% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				8	0.160	0.160	--	lb PM_{10}/ton			
				9	0.143	0.143	--	lb $PM_{2.5}$/ton			
Sidewell Melting Furnaces #2	MC-06	HBH5	X007	5	0.048	0.049	1.59%	lb PM/ton	Exit grain loading design basis for Hot Baghouse #5, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of nine (9) tested condensable PM (CPM) emission factors at 95% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				8	0.160	0.160	--	lb PM_{10}/ton			
				9	0.143	0.143	--	lb $PM_{2.5}$/ton			
Sidewell Melting Furnaces #1	MC-07	HBH5	X007	5	0.048	0.049	1.59%	lb PM/ton	Exit grain loading design basis for Hot Baghouse #5, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of nine (9) tested condensable PM (CPM) emission factors at 95% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				8	0.160	0.160	--	lb PM_{10}/ton			
				9	0.143	0.140	-2.10%	lb $PM_{2.5}$/ton			
Sidewell Melting Furnaces #3	MC-08	HBH6	X008	4	0.052	0.046	-12.26%	lb PM/ton	Exit grain loading design basis for Hot Baghouse #6, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of nine (9) tested condensable PM (CPM) emission factors at 95% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				8	0.163	0.158	-2.91%	lb PM_{10}/ton			
				9	0.144	0.142	-1.37%	lb $PM_{2.5}$/ton			
NDC Recycle Furnace #1	MC-09	HBH7	X009	4	0.092	0.076	-17.33%	lb PM/ton	Exit grain loading design basis for Hot Baghouse #7, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of nine (9) tested condensable PM (CPM) emission factors at 95% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				8	0.190	0.180	-5.32%	lb PM_{10}/ton			
				9	0.160	0.153	-4.47%	lb $PM_{2.5}$/ton			

Table A-1. Summary of PM/PM10/PM2.5 BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Round Top Furnace #2	MC-10	HBH8	X010	4	0.027	0.024	-11.33%	lb PM/ton	Exit grain loading design basis for Hot Baghouse #8, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and average of nine (9) tested condensable PM (CPM) emission factors at 95% confidence level from Group 1 furnace sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				8	0.080	0.078	-2.70%	lb PM_{10}/ton			
				9	0.078	0.076	-2.25%	lb $PM_{2.5}$/ton			
Round Top Furnace #1	MC-11	HBH9	X011	4	0.027	0.024	-11.33%	lb PM/ton	Exit grain loading design basis for Hot Baghouse #9, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and average of nine (9) tested condensable PM (CPM) emission factors at 95% confidence level from Group 1 furnace sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				8	0.080	0.078	-2.70%	lb PM_{10}/ton			
				9	0.078	0.076	-2.25%	lb $PM_{2.5}$/ton			
Holding Furnace #4	MC-12	**HBH8**	**X010**	5	0.013	0.012	-5.84%	lb PM/ton	Exit grain loading design basis for Hot Baghouse #8, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of three (3) tested condensable PM (CPM) emission factors at 99% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				10	0.025	0.024	-4.56%	lb PM_{10}/ton			
				11	0.024	0.023	-3.98%	lb $PM_{2.5}$/ton			
Holding Furnace #3	MC-13	**HBH7**	**X009**	5	0.013	0.013	--	lb PM/ton	Exit grain loading design basis for Hot Baghouse #7, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of three (3) tested condensable PM (CPM) emission factors at 99% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				10	0.025	0.024	-2.28%	lb PM_{10}/ton			
				11	0.024	0.024	--	lb $PM_{2.5}$/ton			
Holding Furnace #2	MC-14	**HBH6**	**X008**	5	0.013	0.012	-4.08%	lb PM/ton	Exit grain loading design basis for Hot Baghouse #6, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of three (3) tested condensable PM (CPM) emission factors at 99% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				10	0.025	0.024	-3.78%	lb PM_{10}/ton			
				11	0.024	0.023	-3.24%	lb $PM_{2.5}$/ton			
Holding Furnace #1	MC-15	**HBH9**	**X011**	5	0.013	0.013	--	lb PM/ton	Exit grain loading design basis for Hot Baghouse #9, technical publication filterable PM_{10} and $PM_{2.5}$ size ratios, and UPL analysis of three (3) tested condensable PM (CPM) emission factors at 99% confidence level from similar sources	High-Efficiency, Lime-Injected Baghouse, Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				10	0.025	0.024	-3.40%	lb PM_{10}/ton			
				11	0.024	0.023	-2.87%	lb $PM_{2.5}$/ton			

Table A-1. Summary of PM/PM10/PM2.5 BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
In-Line Degasser #4	MC-16	**HBH8**	**X010**	6	0.010	0.010	--	lb PM/ton	SMACT emission limit for in-line fluxers and EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios	High-Efficiency, Lime-Injected Baghouse & Good Design and Operating Practices, & Use of Low Sulfur Fuel	N/A
				12	0.00532	0.00532	--	lb PM_{10}/ton			
				13	0.00198	0.00198	--	lb $PM_{2.5}$/ton			
In-Line Degasser #3	**MC-33**	**HBH7**	**X009**	**6**	**0.010**	**0.010**	**--**	**lb PM/ton**	**SMACT emission limit for in-line fluxers and EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios**	**High-Efficiency, Lime-Injected Baghouse & Good Design and Operating Practices**	**N/A**
				12	**0.00532**	**0.00532**	**--**	**lb PM_{10}/ton**			
				13	**0.00198**	**0.00198**	**--**	**lb $PM_{2.5}$/ton**			
In-Line Degasser #2	MC-17	**HBH6**	**X008**	6	0.010	0.010	--	lb PM/ton	SMACT emission limit for in-line fluxers and EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios	High-Efficiency, Lime-Injected Baghouse & Good Design and Operating Practices	N/A
				12	0.00532	0.00532	--	lb PM_{10}/ton			
				13	0.00198	0.00198	--	lb $PM_{2.5}$/ton			
In-Line Degasser #1	MC-18	**HBH9**	**X011**	6	0.010	0.010	--	lb PM/ton	SMACT emission limit for in-line fluxers and EPA PM Calculator filterable PM_{10} and $PM_{2.5}$ size ratios	High-Efficiency, Lime-Injected Baghouse & Good Design and Operating Practices	N/A
				12	0.00532	0.00532	--	lb PM_{10}/ton			
				13	0.00198	0.00198	--	lb $PM_{2.5}$/ton			
Sow Dryers #1	MC-19	na	X006	4	0.038	0.057	50.00%	lb PM/hr	AP-42 PM factor for natural gas combustion, EPA Speciate Database for PM10 and PM2.5	Good Design and Operating Practices & Use of Low Sulfur Fuel	N/A
				7	0.069	0.104	50.97%	lb PM_{10}/hr			
				7	0.069	0.104	50.97%	lb $PM_{2.5}$/hr			
Sow Dryers #2	MC-20	na	X007	4	0.038	0.057	50.00%	lb PM/hr	AP-42 PM factor for natural gas combustion, EPA Speciate Database for PM10 and PM2.5	Good Design and Operating Practices & Use of Low Sulfur Fuel	N/A
				7	0.069	0.104	50.97%	lb PM_{10}/hr			
				7	0.069	0.104	50.97%	lb $PM_{2.5}$/hr			
Dross House	MC-21	HBH2	X004	4	1.60	1.54	-3.45%	lb PM/hr	Exit grain loading design basis for Hot Baghouse #2 and estimated flow contribution from Dross Press capture and collection system	High-Efficiency Baghouse & Good Design and Operating Practices	N/A
				7	1.50	1.45	-3.19%	lb PM_{10}/hr			
				8	1.25	1.20	-3.60%	lb $PM_{2.5}$/hr			
Dross Press #2	MC-22	DPBH1	X009	N/A	N/A				**Exit grain loading design basis for Dross Press's Integral Filter Unit**	**Integral Filtration Unit & Good Design and Operating Practices**	N/A
Dross Press #1	MC-24	DPBH2	X008	N/A	N/A				**Exit grain loading design basis for Dross Press's Integral Filter Unit**	**Integral Filtration Unit & Good Design and Operating Practices**	N/A
Melting & Casting Ingot Saw	MC-32	FLT1	X012	3	1.70E-05	1.48E-04	771.46%	lb PM/ton	Engineering Estimates	Filtration Unit, Good Design and Operating Practices	N/A
				3	1.70E-05	1.48E-04	771.46%	lb PM_{10}/ton			
				3	1.70E-05	1.48E-04	771.46%	lb $PM_{2.5}$/ton			
~~Hot Rolling Ingot Saws (4)~~	~~HR-01~~	~~FLT2/3~~	~~X012~~	~~4~~	~~3.50E-05~~	~~--~~	~~--~~	~~lb PM/ton~~	~~Engineering Estimates~~	~~Filtration Unit, Good Design and Operating Practices~~	~~N/A~~
				~~4~~	~~3.50E-05~~	~~--~~	~~--~~	~~lb PM_{10}/ton~~			
				~~4~~	~~3.50E-05~~	~~--~~	~~--~~	~~lb $PM_{2.5}$/ton~~			
Scalper #1	HR-02	FLT4	X013	3	0.96	0.65	-31.85%	lb PM/hr	Exit grain loading design basis for post-cyclone filtration unit #4.	Filtration Unit, Good Design and Operating Practices	N/A
				3	0.96	0.65	-31.85%	lb PM_{10}/hr			
				3	0.96	0.65	-31.85%	lb $PM_{2.5}$/hr			

Table A-1. Summary of PM/PM10/PM2.5 BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Scalper Chip Handling System Pneumatic Conveyor for Briquetter	HR-03	na	X013	4	0.34	0.19	-45.46%	lb PM/hr	Exit grain loading from recent engineering test of a similar unit (Logan Aluminum Swarf Chip Conveyor).	Good Design and Operating Practices	N/A
				5	0.17	0.10	-43.87%	lb PM_{10}/hr			
				5	0.17	0.10	-43.87%	lb $PM_{2.5}$/hr			
~~Scalper Chip Handling System Pneumatic Conveying Systems #2~~	~~HR-04~~	~~na~~	~~X013~~	~~4~~	~~0.34~~	~~--~~	~~--~~	~~lb PM/hr~~	~~Exit grain loading from recent engineering test of a similar unit (Logan Aluminum Swarf Chip Conveyor).~~	~~Good Design and Operating Practices~~	~~N/A~~
				~~5~~	~~0.17~~	~~--~~	~~--~~	~~lb PM_{10}/hr~~			
				~~5~~	~~0.17~~	~~--~~	~~--~~	~~lb $PM_{2.5}$/hr~~			
~~Scalper Chip Handling System Pneumatic Conveying Systems #3~~	~~HR-05~~	~~na~~	~~X013~~	~~4~~	~~0.34~~	~~--~~	~~--~~	~~lb PM/hr~~	~~Exit grain loading from recent engineering test of a similar unit (Logan Aluminum Swarf Chip Conveyor).~~	~~Good Design and Operating Practices~~	~~N/A~~
				~~5~~	~~0.17~~	~~--~~	~~--~~	~~lb PM_{10}/hr~~			
				~~5~~	~~0.17~~	~~--~~	~~--~~	~~lb $PM_{2.5}$/hr~~			
~~Scalper Chip Handling System Pneumatic Conveying Systems #4~~	~~HR-06~~	~~na~~	~~X013~~	~~4~~	~~0.34~~	~~--~~	~~--~~	~~lb PM/hr~~	~~Exit grain loading from recent engineering test of a similar unit (Logan Aluminum Swarf Chip Conveyor).~~	~~Good Design and Operating Practices~~	~~N/A~~
				~~5~~	~~0.17~~	~~--~~	~~--~~	~~lb PM_{10}/hr~~			
				~~5~~	~~0.17~~	~~--~~	~~--~~	~~lb $PM_{2.5}$/hr~~			
Pusher Furnaces #1	HR-07	na	X014	3	0.39	0.39	--	lb PM/hr	Stack test of a similar unit (Logan Aluminum Pusher Furnace 4).	Good Design and Operating Practices & Use of Low Sulfur Fuel	N/A
				4	0.48	0.48	--	lb PM_{10}/hr			
				4	0.48	0.48	--	lb $PM_{2.5}$/hr			
Pusher Furnaces #2	HR-08	na	X014	3	0.39	0.39	--	lb PM/hr	Stack test of a similar unit (Logan Aluminum Pusher Furnace 4).	Good Design and Operating Practices & Use of Low Sulfur Fuel	N/A
				4	0.48	0.48	--	lb PM_{10}/hr			
				4	0.48	0.48	--	lb $PM_{2.5}$/hr			
Pusher Furnaces #3	HR-09	na	X014	3	0.39	0.39	--	lb PM/hr	Stack test of a similar unit (Logan Aluminum Pusher Furnace 4).	Good Design and Operating Practices & Use of Low Sulfur Fuel	N/A
				4	0.48	0.48	--	lb PM_{10}/hr			
				4	0.48	0.48	--	lb $PM_{2.5}$/hr			
Hot Reversing Mill	HR-10	ME1	X015	3	3.28	3.20	-2.45%	lb PM/hr	Stack only BACT limits from filt. PM exit grain loading design basis for Mist Eliminator #1 and similar unit (Logan Aluminum Reversing Mill) compliance testing for filterable PM10 and PM2.5 emissions ratios and CPM emission factors	Mist Eliminator, Good Design and Operating Practices	Wet scrubbers are not cost effective as demonstrated in Section 6.4.7 of Orig. PSD App.
				4	7.14	7.07	-0.99%	lb PM_{10}/hr			
				5	6.56	6.50	-0.93%	lb $PM_{2.5}$/hr			
Hot Finishing Mill	HR-11	ME2	X016	3	6.61	6.36	-3.85%	lb PM/hr	Stack only BACT limits from filt. PM exit grain loading design basis for Mist Eliminator #2 and similar unit (Logan Aluminum Reversing Mill) compliance testing for filterable PM10 and PM2.5 emissions ratios and CPM emission factors	Mist Eliminator, Good Design and Operating Practices	Wet scrubbers are not cost effective as demonstrated in Section 6.4.7 of Orig. PSD App.
				4	14.7	14.4	-1.79%	lb PM_{10}/hr			
				5	13.2	13.0	-1.27%	lb $PM_{2.5}$/hr			
Tandem Cold Mill	CR-01	CND1/ME3	X017	3	2.36	2.34	-0.80%	lb PM/hr	Performance specification of Mist Eliminator #3 for PM factor, engineering test report of similar facility (Logan Aluminum) for PM10 and PM2.5 factor.	Condenser, Mist Eliminators, Good Design and Operating Practices	Wet scrubbers are not cost effective as demonstrated in Section 7.5.1 of As-Built PSD App.
				4	2.23	2.22	-0.48%	lb PM_{10}/hr			
				5	2.00	1.98	-0.81%	lb $PM_{2.5}$/hr			

Table A-1. Summary of PM/PM10/PM2.5 BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Alkaline Cleaning Line	CF-02	SC1	X018	3	0.20	0.14	-28.33%	lb PM/hr	Emission estimate from a prospective equipment vendor for similar equipment.	Demister/ Wet Scrubber, Good Design and Operating Practices	N/A
				3	0.20	0.14	-28.33%	lb PM_{10}/hr			
				3	0.20	0.14	-28.33%	lb $PM_{2.5}$/hr			
Coating Line #1	CF-03	RTO1	X018	4	4.15	2.73	-34.23%	lb PM/hr	Performance specification of RTO for PM factor, engineering test report of similar facility (Logan Aluminum) for PM10 and PM2.5 factor.	Good Design and Operating Practices& Use of Low Sulfur Fuel	N/A
				5	4.05	2.64	-34.82%	lb PM_{10}/hr			
				6	3.42	2.22	-35.19%	lb $PM_{2.5}$/hr			
Edge Trimmer-Electrostatic Oiler	**CF-04**	**na**	**TBD**	**N/A**	**N/A**				**Design specifications for lubricant application rate and transfer efficiency and good operating practices.**	**Good Design and Operating Practices**	**N/A**
Edge Trimmer-Scrap Baller	**CF-05**	**SC2**	**TBD**	**N/A**	**N/A**	**0.27**	**--**	**lb PM/hr**	**Exit grain loading design basis for Demister/Scrubber #2.**	**Demister/ Wet Scrubber, Good Design and Operating Practices**	**N/A**
						0.27	**--**	**lb PM10/hr**			
						0.27	**--**	**lb PM2.5/hr**			
~~Hot Water Boilers #1-#3~~	~~AS-01 through AS-03~~	~~na~~	~~X019~~	~~3~~	~~0.046~~	~~--~~	~~--~~	~~lb PM/hr~~	~~AP-42 PM factor for natural gas combustion, EPA Speciate Database for PM10 and PM2.5~~	~~Good Design and Operating Practices & Use of Low Sulfur Fuel~~	~~N/A~~
				~~4~~	~~0.083~~	~~--~~	~~--~~	~~lb PM_{10}/hr~~			
				~~4~~	~~0.083~~	~~--~~	~~--~~	~~lb $PM_{2.5}$/hr~~			

Table A-2. Summary of NOX BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Decoater #3	MC-01	HBH1	X003	7	9.70	8.82	-9.09%	lb/hr	Similar source (Logan Aluminum Decoater A and B) NOX BACT limit	Low NOX Burners (LNB) and Good Combustion and Operating Practices (GCOP)	Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR) are not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Decoater #2	MC-02	HBH2	X004	11	9.70	8.82	-9.09%	lb/hr	Similar source (Logan Aluminum Decoater A and B) NOX BACT limit	LNB and GCOP	Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR) are not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Decoater #1	MC-03	HBH3	X005	7	9.70	8.82	-9.09%	lb/hr	Similar source (Logan Aluminum Decoater A and B) NOX BACT limit	LNB and GCOP	Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR) are not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Sidewell Melting Furnace #5	MC-04	HBH4	X006	11	0.35	0.35	--	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired regenerative burners and Upper Prediction Limit (UPL) analysis of six (6) tested NOX emission factors at 95% confidence level from similar sources for metal processing NOX emissions contribution	LNB and GCOP	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Sidewell Melting Furnace #4	MC-05	HBH4	X006	11	0.35	0.35	--	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired regenerative burners and Upper Prediction Limit (UPL) analysis of six (6) tested NOX emission factors at 95% confidence level from similar sources for metal processing NOX emissions contribution	LNB and GCOP	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Sidewell Melting Furnaces #2	MC-06	HBH5	X007	11	0.35	0.35	--	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired regenerative burners and Upper Prediction Limit (UPL) analysis of six (6) tested NOX emission factors at 95% confidence level from similar sources for metal processing NOX emissions contribution	LNB and GCOP	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Sidewell Melting Furnaces #1	MC-07	HBH5	X007	11	0.35	0.35	--	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired regenerative burners and Upper Prediction Limit (UPL) analysis of six (6) tested NOX emission factors at 95% confidence level from similar sources for metal processing NOX emissions contribution	LNB and GCOP	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Sidewell Melting Furnaces #3	MC-08	HBH6	X008	14	0.35	0.35	--	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired regenerative burners and Upper Prediction Limit (UPL) analysis of six (6) tested NOX emission factors at 95% confidence level from similar sources for metal processing NOX emissions contribution	LNB and GCOP	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
NDC Recycle Furnace #1	MC-09	HBH7	X009	14	0.54	0.51	-5.97%	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired regenerative burners and Upper Prediction Limit (UPL) analysis of six (6) tested NOX emission factors at 95% confidence level from similar sources for metal processing NOX emissions contribution	LNB	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Round Top Furnace #2	MC-10	HBH8	X010	14	0.32	0.30	-6.67%	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired regenerative burners and minimum of nine (9) tested emission factors from Group 1 furnace sources for metal processing NOX emissions contribution	LNB	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.

Table A-2. Summary of NOX BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Round Top Furnace #1	MC-11	HBH9	X011	14	0.32	0.30	-6.67%	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired regenerative burners and minimum of nine (9) tested emission factors from Group 1 furnace sources for metal processing NOX emissions contribution	LNB	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Holding Furnace #4	MC-12	**HBH8**	**X010**	15	0.045	0.034	-25.46%	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired cold air burners	LNB	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Holding Furnace #3	MC-13	**HBH7**	**X009**	15	0.045	0.034	-25.46%	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired cold air burners	LNB	SCR is not cost effective as demonstrated by calculations in Appendix G (Sect. G-7) of As-Built PSD App.
Holding Furnace #2	MC-14	**HBH6**	**X008**	15	0.037	0.034	-6.83%	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired cold air burners	LNB	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Holding Furnace #1	MC-15	**HBH9**	**X011**	15	0.037	0.034	-6.83%	lb/ton	Based on vendor estimate for NOX emissions from natural gas-fired cold air burners	LNB	SCR is not cost effective as demonstrated by calculations in Appendix G of Orig. PSD App.
Sow Dryers #1	MC-19	na	X006	10	1.08	3.28	203.33%	lb/hr	**Based on vendor estimate for NOX emissions from natural gas-fired burners**	LNB & GCOP	N/A
Sow Dryers #2	MC-20	na	X007	10	1.08	3.28	203.33%	lb/hr	**Based on vendor estimate for NOX emissions from natural gas-fired burners**	LNB & GCOP	N/A
Pusher Furnaces #1	HR-07	na	X014	5	0.137	0.137	--	lb/MMBtu	Vendor estimates for the worst-case NOX emissions performance of the recuperative low-NOX burner system in comparable sources	Good Design and Operating Practices & Use of Low Sulfur Fuel	N/A
Pusher Furnaces #2	HR-08	na	X014	5	0.137	0.137	--	lb/MMBtu	Vendor estimates for the worst-case NOX emissions performance of the recuperative low-NOX burner system in comparable sources	Good Design and Operating Practices & Use of Low Sulfur Fuel	N/A
Pusher Furnaces #3	HR-09	na	X014	5	0.137	0.137	--	lb/MMBtu	Vendor estimates for the worst-case NOX emissions performance of the recuperative low-NOX burner system in comparable sources	Good Design and Operating Practices & Use of Low Sulfur Fuel	N/A
Coating Line #1	CF-03	RTO1	X018	7	0.107	0.150	40.29%	lb/MMBtu	Emission performance specification for coating line RTO	Good Design and Operating Practices& Use of Low Sulfur Fuel	N/A
~~Hot Water Boilers #1 #3~~	~~AS-01 through AS-03~~	~~na~~	~~X019~~	~~6~~ ~~6~~ ~~6~~	~~0.050~~ ~~0.050~~ ~~0.050~~	~~—~~ ~~—~~ ~~—~~	~~—~~ ~~—~~ ~~—~~	~~lb/MMBtu~~ ~~lb/MMBtu~~ ~~lb/MMBtu~~	~~Low NOx Burner performance specification~~	~~GCOP~~	~~SCR is not cost effective as demonstrated by calculations in Appendix G.~~

Table A-3. Summary of CO BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Decoater #3	MC-01	HBH1	X003	8	8.43	7.78	-7.76%	lb/hr	Based on vendor estimate for CO emissions from comparable equipment and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing CO emissions contribution	GCOP	Add-on Catalytic Oxidation is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Decoater #2	MC-02	HBH2	X004	12	8.43	7.78	-7.76%	lb/hr	Based on vendor estimate for CO emissions from comparable equipment and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing CO emissions contribution	GCOP	Add-on Catalytic Oxidation is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Decoater #1	MC-03	HBH3	X005	8	8.43	7.78	-7.76%	lb/hr	Based on vendor estimate for CO emissions from comparable equipment and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing CO emissions contribution	GCOP	Add-on Catalytic Oxidation is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Sidewell Melting Furnace #5	MC-04	HBH4	X006	13	0.35	0.34	-3.92%	lb/ton	Based on vendor estimate for CO emissions from comparable equipment and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing CO emissions contribution	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Sidewell Melting Furnace #4	MC-05	HBH4	X006	13	0.35	0.34	-3.92%	lb/ton	Based on vendor estimate for CO emissions from comparable equipment and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing CO emissions contribution	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Sidewell Melting Furnaces #2	MC-06	HBH5	X007	13	0.35	0.34	-3.92%	lb/ton	Based on vendor estimate for CO emissions from comparable equipment and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing CO emissions contribution	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Sidewell Melting Furnaces #1	MC-07	HBH5	X007	13	0.35	0.34	-3.92%	lb/ton	Based on vendor estimate for CO emissions from comparable equipment and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing CO emissions contribution	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Sidewell Melting Furnaces #3	MC-08	HBH6	X008	16	0.35	0.34	-3.92%	lb/ton	Based on vendor estimate for CO emissions from comparable equipment and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing CO emissions contribution	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
NDC Recycle Furnace #1	MC-09	HBH7	X009	16	0.45	0.38	-15.87%	lb/ton	Based on vendor estimate for CO emissions from comparable equipment and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing CO emissions contribution	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Round Top Furnace #2	MC-10	HBH8	X010	16	0.20	0.20	--	lb/ton	Based on vendor estimate for CO emissions from natural gas-fired regenerative burners and minimum of nine (9) tested emission factors from Group 1 furnace sources for metal processing CO emissions contribution	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.

Table A-3. Summary of CO BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Round Top Furnace #1	MC-11	HBH9	X011	16	0.20	0.20	--	lb/ton	Based on vendor estimate for CO emissions from natural gas-fired regenerative burners and minimum of nine (9) tested emission factors from Group 1 furnace sources for metal processing CO emissions contribution	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Holding Furnace #4	MC-12	**HBH8**	**X010**	17	0.060	0.037	-38.21%	lb/ton	AP-42 CO factor for natural gas combustion	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Holding Furnace #3	MC-13	**HBH7**	**X009**	17	0.060	0.037	-38.21%	lb/ton	AP-42 CO factor for natural gas combustion	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Holding Furnace #2	MC-14	**HBH6**	**X008**	17	0.050	0.038	-23.80%	lb/ton	AP-42 CO factor for natural gas combustion	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Holding Furnace #1	MC-15	**HBH9**	**X011**	17	0.050	0.038	-23.80%	lb/ton	AP-42 CO factor for natural gas combustion	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Sow Dryers #1	MC-19	na	X006	12	1.46	2.19	50.00%	lb/hr	Similar source unit vendor estimates	GCOP	N/A
Sow Dryers #2	MC-20	na	X007	12	1.46	2.19	50.00%	lb/hr	Similar source unit vendor estimates	GCOP	N/A
Pusher Furnaces #1	HR-07	na	X014	6	0.067	0.067	--	lb/MMBtu	Recuperative burner CO emissions performance specification combustion system design	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Pusher Furnaces #2	HR-08	na	X014	6	0.067	0.067	--	lb/MMBtu	Recuperative burner CO emissions performance specification combustion system design	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Pusher Furnaces #3	HR-09	na	X014	6	0.067	0.067	--	lb/MMBtu	Recuperative burner CO emissions performance specification combustion system design	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
Coating Line #1	CF-03	RTO1	X018	8	19.8	13.23	-33.19%	lb/hr	**Emission performance specification for coating line RTO**	GCOP	CatOx is not cost effective as demonstrated by calculations in Appendix H of Orig. PSD App.
~~Hot Water Boilers #1 - #3~~	~~AS-01 through AS-03~~	~~na~~	~~X019~~	~~7~~	~~84.0~~	~~--~~	~~--~~	~~lb/MMBtu~~	~~AP-42 CO factor for natural gas combustion~~	~~GCOP~~	~~N/A~~
				~~7~~	~~84.0~~	~~--~~	~~--~~	~~lb/MMBtu~~			
				~~7~~	~~84.0~~	~~--~~	~~--~~	~~lb/MMBtu~~			

Table A-4. Summary of VOC BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Decoater #3	MC-01	HBH1	X003	9	0.16	0.17	6.25%	lb/ton	Based on AP-42 emission factor for VOC emissions from natural gas-fired burners and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	Thermal Oxidation & GCOP	CatOx is not a cost-effective control option for the Decoater based on calculations in Appendix H of Orig. PSD App.
Decoater #2	MC-02	HBH2	X004	13	0.16	0.17	6.25%	lb/ton	Based on AP-42 emission factor for VOC emissions from natural gas-fired burners and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	Thermal Oxidation & GCOP	CatOx is not a cost-effective control option for the Decoater based on calculations in Appendix H of Orig. PSD App.
Decoater #1	MC-03	HBH3	X005	9	0.16	0.17	6.25%	lb/ton	Based on AP-42 emission factor for VOC emissions from natural gas-fired burners and UPL analysis of six (6) tested emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	Thermal Oxidation & GCOP	CatOx is not a cost-effective control option for the Decoater based on calculations in Appendix H of Orig. PSD App.
Sidewell Melting Furnace #5	MC-04	HBH4	X006	15	0.22	0.22	--	lb/ton	Based on AP-42 emission factors for VOC emissions from natural gas-fired regenerative burners and UPL analysis of VOC emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Sidewell Melting Furnace #4	MC-05	HBH4	X006	15	0.22	0.22	--	lb/ton	Based on AP-42 emission factors for VOC emissions from natural gas-fired regenerative burners and UPL analysis of VOC emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Sidewell Melting Furnaces #2	MC-06	HBH5	X007	15	0.22	0.22	--	lb/ton	Based on AP-42 emission factors for VOC emissions from natural gas-fired regenerative burners and UPL analysis of VOC emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Sidewell Melting Furnaces #1	MC-07	HBH5	X007	15	0.22	0.22	--	lb/ton	Based on AP-42 emission factors for VOC emissions from natural gas-fired regenerative burners and UPL analysis of VOC emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Sidewell Melting Furnaces #3	MC-08	HBH6	X008	18	0.22	0.22	--	lb/ton	Based on AP-42 emission factors for VOC emissions from natural gas-fired regenerative burners and UPL analysis of VOC emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
NDC Recycle Furnace #1	MC-09	HBH7	X009	18	0.23	0.23	--	lb/ton	Based on AP-42 emission factors for VOC emissions from natural gas-fired regenerative burners and UPL analysis of VOC emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Round Top Furnace #2	MC-10	HBH8	X010	18	0.072	0.071	-1.39%	lb/ton	Based on AP-42 emission factors for VOC emissions from natural gas-fired regenerative burners and UPL analysis of VOC emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.

Table A-4. Summary of VOC BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Round Top Furnace #1	MC-11	HBH9	X011	18	0.072	0.071	-1.39%	lb/ton	Based on AP-42 emission factors for VOC emissions from natural gas-fired regenerative burners and UPL analysis of VOC emission factors at 95% confidence level from similar sources for metal processing VOC emissions contribution	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Holding Furnace #4	MC-12	**HBH8**	**X010**	19	0.031	0.031	--	lb/ton	BACT limit from comparable facility for metal processing and natural gas contributions	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Holding Furnace #3	MC-13	**HBH7**	**X009**	19	0.031	0.031	--	lb/ton	BACT limit from comparable facility for metal processing and natural gas contributions	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Holding Furnace #2	MC-14	**HBH6**	**X008**	19	0.031	0.031	--	lb/ton	BACT limit from comparable facility for metal processing and natural gas contributions	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Holding Furnace #1	MC-15	**HBH9**	**X011**	19	0.031	0.031	--	lb/ton	BACT limit from comparable facility for metal processing and natural gas contributions	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Sow Dryers #1	MC-19	**na**	**X006**	14	0.11	0.17	50.00%	lb/hr	AP-42 VOC factor for natural gas combustion	GCOP	N/A
Sow Dryers #2	MC-20	**na**	**X007**	14	0.11	0.17	50.00%	lb/hr	AP-42 VOC factor for natural gas combustion	GCOP	N/A
Melting and Casting Ingot Saw	MC-32	FLT1	X012	5	2.32	2.65	14.03%	lb/hr	Engineering Estimate	Good Design and Operating Practices	N/A
~~Hot Rolling Saws (4)~~	~~HR-01~~	~~FLT2/3~~	~~X012~~	~~6~~	~~2.32~~	~~—~~	~~—~~	~~lb/hr~~	~~Engineering Estimate~~	~~Good Design and Operating Practices~~	~~N/A~~
Scalper #1	HR-02	FLT4	X013	6	16.6	20.31	22.35%	lb/hr	UPL at 95% confidence level from three (3) test runs of VOC emission factors from similar source (Logan Aluminum Scalper 2).	Good Design and Operating Practices	N/A
Pusher Furnaces #1	HR-07	na	X014	7	0.004	0.004	--	lb/MMBtu	Stack test of similar unit (Logan Aluminum Pusher Furnace)	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.

Table A-4. Summary of VOC BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Pusher Furnaces #2	HR-08	na	X014	7	0.004	0.004	--	lb/MMBtu	Stack test of similar unit (Logan Aluminum Pusher Furnace)	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Pusher Furnaces #3	HR-09	na	X014	7	0.004	0.004	--	lb/MMBtu	Stack test of similar unit (Logan Aluminum Pusher Furnace)	GCOP	CatOx is not a cost-effective control option for the furnace based on calculations in Appendix H of Orig. PSD App.
Hot Reversing Mill	HR-10	ME1	X015	6	58.0	58.0	--	lb/hr	Stack only BACT limit based on UPL at 90% confidence level from four (4) test runs of VOC emission factor from similar source (Logan Reversing Mill) for coolant contribution and mass balance for bite aid contribution.	Good Operating and Maintenance Practices	RTO, condensation systems, and adsorption systems are not cost-effective control options based on calculations in Appendix I of Orig. PSD App.
Hot Finishing Mill	HR-11	ME2	X016	6	92.6	92.6	--	lb/hr	Stack only BACT limit based on UPL at 90% confidence level from four (4) test runs of VOC emission factor from similar source (Logan Reversing Mill) scaled by 4X to account for Hot Finishing Mill configuration differences for coolant contribution and mass balance for bite aid contribution.	Good Operating and Maintenance Practices	RTO, condensation systems, and adsorption systems are not cost-effective control options based on calculations in Appendix I of Orig. PSD App.
Tandem Cold Mill	CR-01	CND1/ME3	X017	6	23.0	22.9	-0.43%	lb/hr	Based on calculated UPL concentration from Method 25A THC testing of a similar unit. UPL analysis performed on three (3) tested runs at a confidence level of 95%.	Condenser and Good Operating and Maintenance	RTO, refrigerated condensation systems (targeting VOC removal), and adsorption systems are not cost-effective control options based on calculations in Appendix I (Sect. I-7 to I-9) of As-Built PSD App.
Tension Leveler	CF-01	na	X018	N/A					Engineering Estimate	Lubricant usage limitation as work practice standard, and Good Operating and Maintenance Practices	N/A
Alkaline Cleaning Line	CF-02	SC1	X018	9	1.61	0.08	-94.87%	lb/hr	Engineering Estimate	Wet scrubber and Good Operating and Maintenance Practices	N/A
Coating Line #1	CF-03	RTO1	X018	10	4.48	2.89	-35.54%	lb/hr	Vendor estimates for RTO emissions performance as supported by similar source stack test data.	RTO	N/A
Edge Trimmer - Electrostatic Oiler	**CF-04**	**na**	**TBD**	**N/A**					**Design specifications for lubricant application rate and transfer efficiency.**	**Lubricant usage limitation as work practice standard, and Good Operating and Maintenance Practices**	**N/A**
~~Hot Water Boilers #1 #3~~	~~AS-01 through AS-03~~	~~na~~	~~X019~~	~~8~~	~~0.0055~~	~~--~~	~~--~~	~~lb/MMBtu~~	~~Based on AP-42 emission factor for VOC~~	~~GCOP~~	~~N/A~~
				~~8~~	~~0.0055~~	~~--~~	~~--~~	~~lb/MMBtu~~			
				~~8~~	~~0.0055~~	~~--~~	~~--~~	~~lb/MMBtu~~			

Table A-5. Summary of GHG BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Decoater #3	MC-01	HBH1	X003	13	55,858	52,290	-6.39%	tpy, CO_2e	Mass balance based on incoming organic contaminants level on feed/charge for metal processing contribution and 40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Decoater Efficiency, Fuel Selection, & GCOP	N/A
Decoater #2	MC-02	HBH2	X004	17	55,858	52,290	-6.39%	tpy, CO2e	Mass balance based on incoming organic contaminants level on feed/charge for metal processing contribution and 40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Decoater Efficiency, Fuel Selection, & GCOP	N/A
Decoater #1	MC-03	HBH3	X005	13	55,858	52,290	-6.39%	tpy, CO2e	Mass balance based on incoming organic contaminants level on feed/charge for metal processing contribution and 40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Decoater Efficiency, Fuel Selection, & GCOP	N/A
Sidewell Melting Furnace #5	MC-04	HBH4	X006	18	19,490	19,490	--	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Sidewell Melting Furnace #4	MC-05	HBH4	X006	18	19,490	19,490	--	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Sidewell Melting Furnaces #2	MC-06	HBH5	X007	18	19,490	19,490	--	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Sidewell Melting Furnaces #1	MC-07	HBH5	X007	18	19,490	19,490	--	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Sidewell Melting Furnaces #3	MC-08	HBH6	X008	22	19,490	19,490	--	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
NDC Recycle Furnace #1	MC-09	HBH7	X009	22	65,928	67,215	1.95%	tpy, CO2e	Mass balance based on incoming organic contaminants level on feed/charge for metal processing contribution and 40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Round Top Furnace #2	MC-10	HBH8	X010	22	58,982	57,443	-2.61%	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Round Top Furnace #1	MC-11	HBH9	X011	22	58,982	57,443	-2.61%	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A

Table A-5. Summary of GHG BACT Determinations

EU Description	EU ID	Control Device ID	PSD Permit	PSD Permit Proviso for BACT Limit	Short-Term BACT Emission Limits				Basis for Emission Limit	Control Type	Cost Analyses Presented in Determination
					As-Perm. Value	As. Built Value	% Diff.	Units (each)			
Holding Furnace #4	MC-12	HBH8	X010	22	15,387	13,848	-10.00%	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Holding Furnace #3	MC-13	HBH7	X009	22	15,387	13,848	-10.00%	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Holding Furnace #2	MC-14	HBH6	X008	22	15,387	13,848	-10.00%	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Holding Furnace #1	MC-15	HBH9	X011	22	15,387	13,848	-10.00%	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Sow Dryers #1	MC-19	na	X006	18	10,258	10,258	--	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Sow Dryers #2	MC-20	na	X007	18	10,258	10,258	--	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Pusher Furnaces #1	HR-07	na	X014	8	25,013	25,012	-0.004%	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Pusher Furnaces #2	HR-08	na	X014	8	25,013	25,012	-0.004%	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Pusher Furnaces #3	HR-09	na	X014	8	25,013	25,012	-0.004%	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Furnace Efficiency, Fuel Selection, & GCOP	N/A
Coating Line #1	CF-03	RTO1	X018	13	47,779	22,598	-52.70%	tpy, CO2e	40 CFR 98 Subpart C for natural gas combustion contribution	Optimum Decoater Efficiency, Fuel Selection, & GCOP	N/A
~~Hot Water Boilers #1 #3~~	~~AS-01 through AS-03~~	~~na~~	~~X019~~	~~9~~ ~~9~~ ~~9~~	~~12,309~~ ~~12,309~~ ~~12,309~~	~~--~~ ~~--~~ ~~--~~	~~--~~ ~~--~~ ~~--~~	~~tpy, CO2e~~ ~~tpy, CO2e~~ ~~tpy, CO2e~~	~~40 CFR 98 Subpart C for natural gas combustion contribution~~	~~Optimum Boiler Efficiency, Fuel Selection, & GCOP~~	~~N/A~~

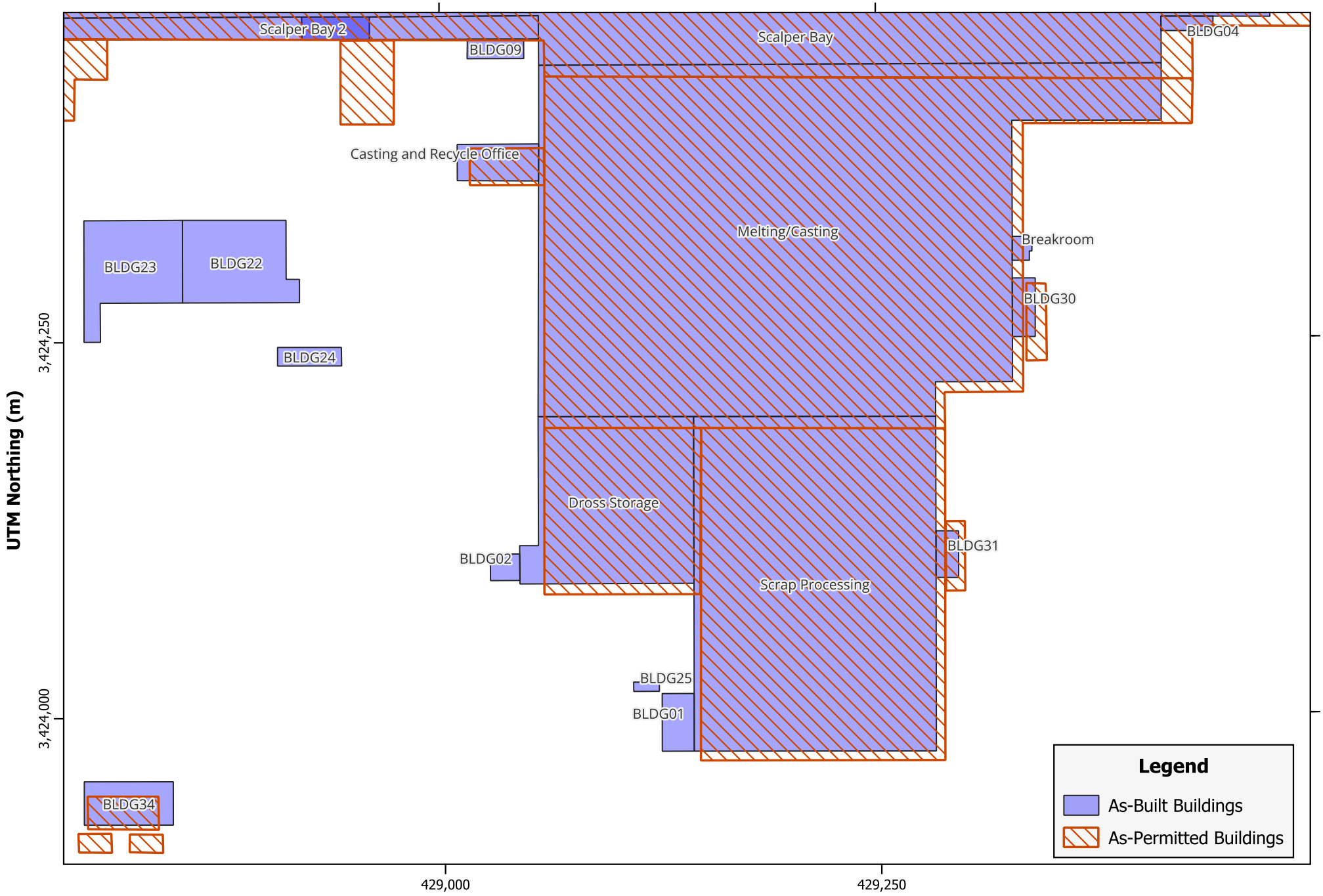
Table A-6. Summary of Annual Process Rates Using Process Bottlenecks/Limitations

EU ID	EU Description	PSD Permit	Process ID	Process Description	Appendix C Section	Annual Process Rate		Implied Annual Capacity Factor	Basis for Process Bottleneck/Limitation
						Value	Units (each)	(%)	
MC-19	**Sow Dryer #2 (Flex Line)**	**X006**	**1**	**Natural Gas Usage**	**9.1 Sow Dryer Process Rates: Metal Throughput and Gas Firing Rate**	**175.2**	**MMscf/yr**	**66.7%**	**Proposed annual operating limit for natural gas usage based on original PSD permit basis for Sow Dryers**
MC-20	**Sow Dryer #1 (CBS Line)**	**X007**	**1**	**Natural Gas Usage**	**9.1 Sow Dryer Process Rates: Metal Throughput and Gas Firing Rate**	**175.2**	**MMscf/yr**	**66.7%**	**Proposed annual operating limit for natural gas usage based on original PSD permit basis for Sow Dryers**
MC-32	Melting & Casting Ingot Saw	X012	1	Aluminum Production	14.1 Ingot Saw Process Rates: Metal Throughput	63,552	tpy	**9.8%**	Maximum hourly ingot saw capacity (**1.5** ingots/hr and **74.4** ton/hr) is much higher than expected to be used in practice. Annual process rate assumes a worst-case of 3% of the ingot rolling capacity for the Hot Rolling Area will be rejected and require sawing in the Melting & Casting area
~~HR-01~~	~~Hot Rolling Ingot Saws (4)~~	~~X012~~	~~1~~	~~Aluminum Production~~	—	—	—	—	—
HR-02	Scalper #1	X013	1	Aluminum Production	15.1 Ingot Scalper Process Rates: Metal Throughput	2,118,414	tpy	**38.7%**	Maximum hourly ingot scalper capacity (**13.5** ingots/hr and **625.1** ton/hr) is higher than expected to be used in practice on a long-term average basis. Annual process rate is based on maximum product mix weighted unscalped ingot hourly process rate to meet requirements of the hot rolling mill multiplied by a maximum achievable 85% utilization for annual operating hours (i.e., 85% x 8,760 hr/yr = 7,446 hr/yr)
HR-03	Scalper Chip Handling System Pneumatic Conveyor for Briquetter	X013	1	Aluminum Production	16.1 Scalper Chip Handling System Pneumatic Conveyor Process Rates: Metal Throughput	**46,771**	tpy	**38.7%**	**Ingot Scalper #1 annual process rate limitation multiplied by ratio of maximum hourly scalper chip generation rate to maximum hourly scalper ingot process rate**
HR-07	Pusher Furnace #1	X014	1	Aluminum Production	17.1 Pusher Furnace Process Rates: Aluminum Production and Natural Gas Usage	688,485	tpy	70.5%	Same basis as Hot Reversing Mill (HRM) since all ingots processed in HRM must first be processed in the Pusher Furnaces.
HR-07	Pusher Furnace #1	X014	2	Natural Gas Usage	17.1 Pusher Furnace Process Rates: Aluminum Production and Natural Gas Usage	427.2	MMscf/yr	46.5%	Worst-case product mix weighted average natural gas specific fuel consumption (MMscf of NG used per ton of aluminum processed) multiplied by the annual aluminum process rate. Pusher Furnaces operate according to a batch operating cycle where the full burner heat input rating is only required for a brief portion of the overall cycle time.
HR-10	Hot Reversing Mill	X015	1	Aluminum Production	18.1 Hot Reversing Mill Process Rates	2,065,454	tpy	70.5%	Proposed operating constraint; Derived from product mix-weighted avg. (long-term avg.) HRM process rate (277.4 ton/hr) multiplied by an maximum achievable 85% capacity factor (85% x 8,760 hr/yr).
HR-10	Hot Reversing Mill	X015	1	Aluminum Production	18.1 Hot Reversing Mill Process Rates	4,800	l/yr	2.0%	Proposed operating limit; based on the expected frequency of bite refusals requiring bite aid application. Novelis accepts limit and will track monthly bite aid usage on monthly and 12-month rolling basis.
HR-11	Hot Finishing Mill	X016	1	Aluminum Production	19.1 Hot Finishing Mill Process Rates	1,968,377	tpy	70.5%	Proposed operating constraint; Derived from product mix-weighted avg. (long-term avg.) HRM process rate (277.4 ton/hr) multiplied by an maximum achievable 85% capacity factor (85% x 8,760 hr/yr).

Table A-6. Summary of Annual Process Rates Using Process Bottlenecks/Limitations

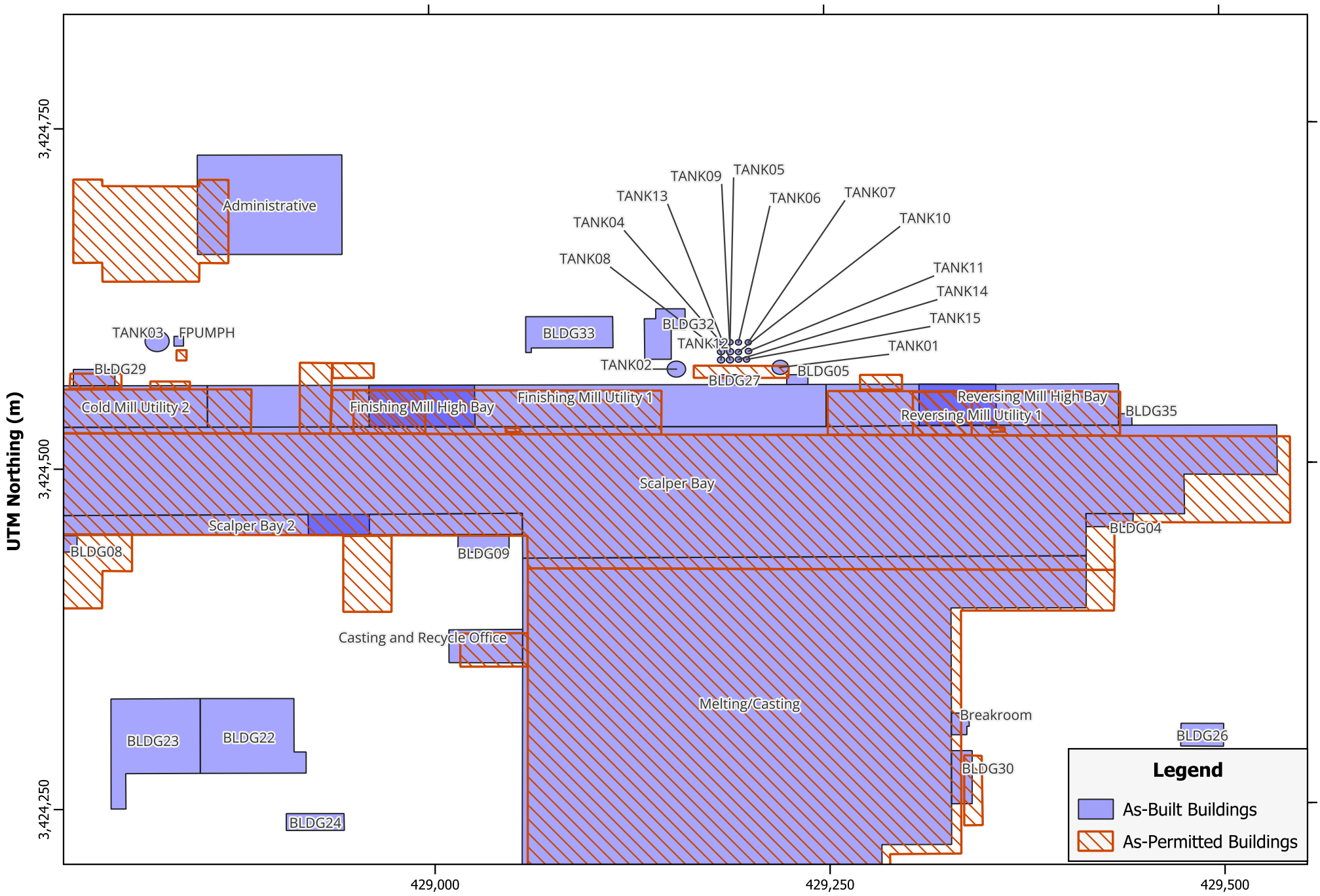
EU ID	EU Description	PSD Permit	Process ID	Process Description	Appendix C Section	Annual Process Rate		Implied Annual Capacity Factor	Basis for Process Bottleneck/Limitation
						Value	Units (each)	(%)	
HR-11	Hot Finishing Mill	X016	1	Aluminum Production	19.1 Hot Finishing Mill Process Rates	16,800	l/yr	7.4%	Proposed operating limit; based on the expected frequency of bite refusals requiring bite aid application. Novelis accepts limit and will track monthly bite aid usage on monthly and 12-month rolling basis.
CR-01	Tandem Cold Mill #1	X017	1	Aluminum Production	20.1 Tandem Cold Mill Process Rates	**1,099,680**	tpy	**40.5%**	Proposed operating constraint; Derived from product mix-weighted avg. (long-term avg.) TCM process rate (**158** ton/hr) assuming maximum expected annual operating hours.
CF-04	**Edge Trimmer-Electrostatic Oiler**	**TBD**	**1**	**Strip Area Processed**	**24.1.1 Strip Area Processing Capacity & 24.2.1 VOC Emission Factor**	**341,092**	**gal/yr**	**100.0%**	**Proposed annual operating limitation for lubricant usage to ensure good design and operating practices**
AS-19	**Combined Building Heating Systems**	**TBD**	**1**	**Natural Gas Usage**	**30.1 Building Heating Systems Natural Gas Usage Rate**	**486.7**	**MMscf/yr**	**14.2%**	**Proposed annual operating limit based on original PSD permit basis for Building Heating Systems**

Figure A-1. Scrap Processing and Melting/Casting Area As-Built vs As-Permitted Building Layouts



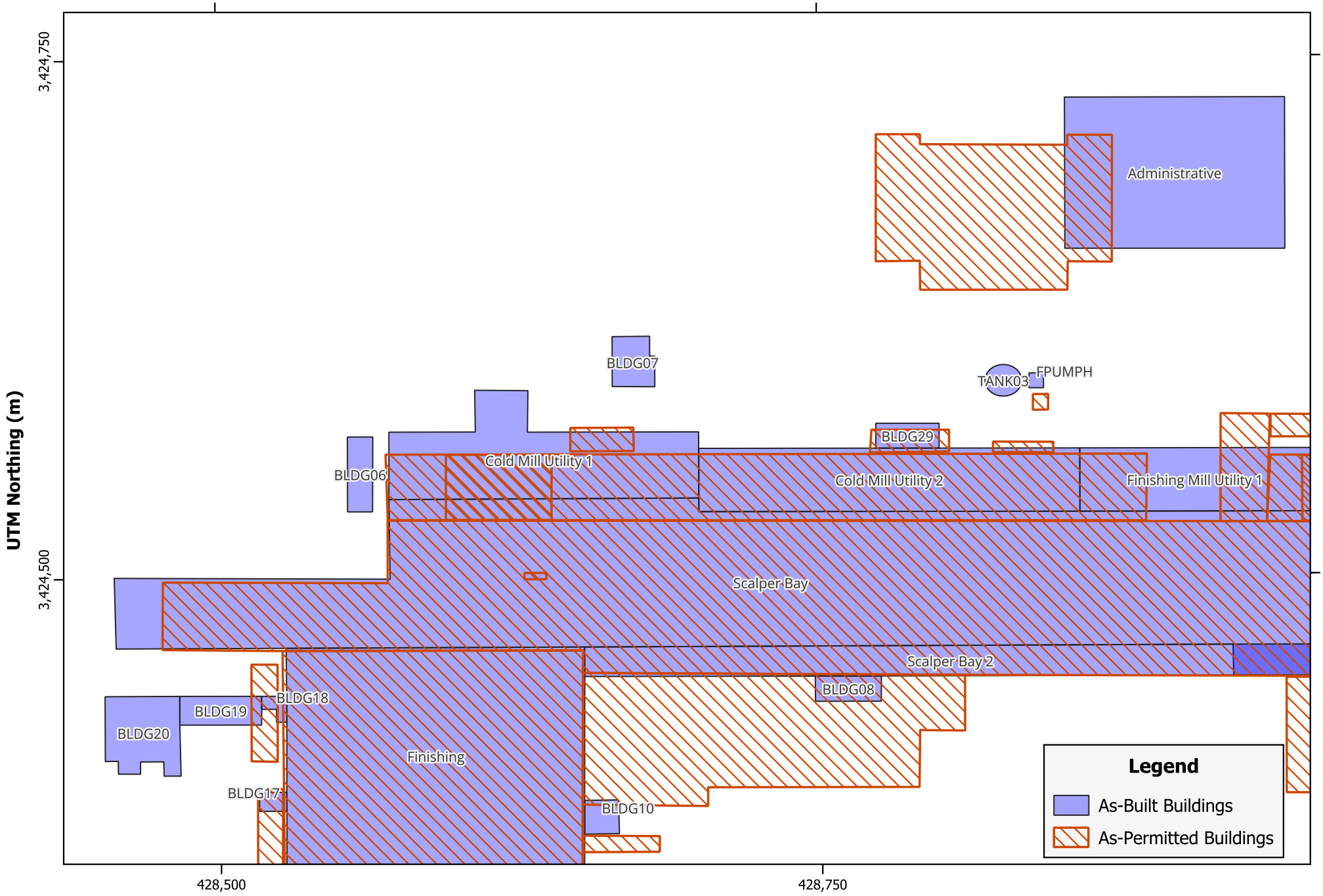
All coordinates shown in UTM Coordinates,
UTM Zone 16, NAD 83 Datum

Figure A-2. Hot Mill Area As-Built vs As-Permitted Building Layouts



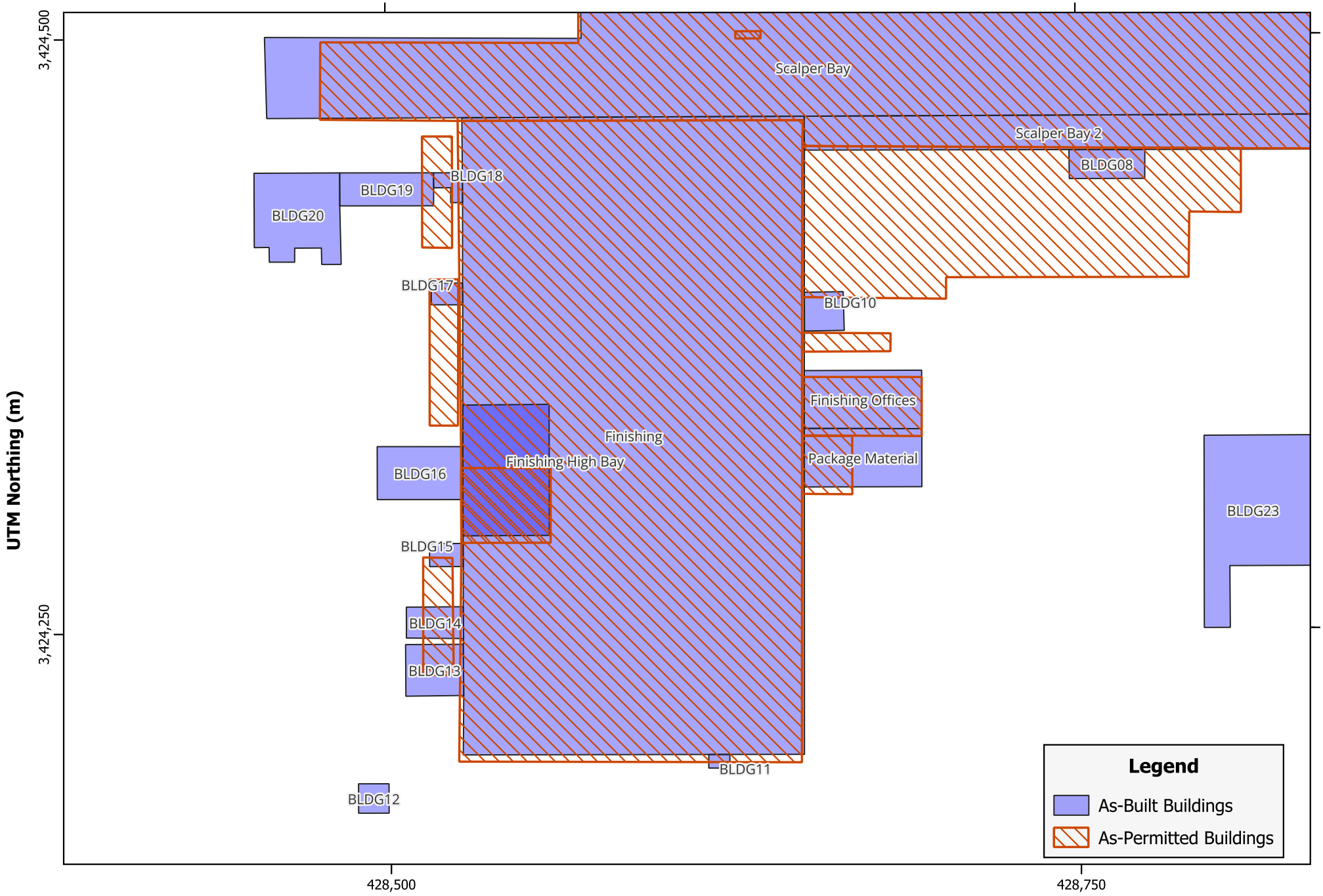
All coordinates shown in UTM Coordinates,
UTM Zone 16, NAD 83 Datum

Figure A-3. Cold Mill Area As-Built vs As-Permitted Building Layouts



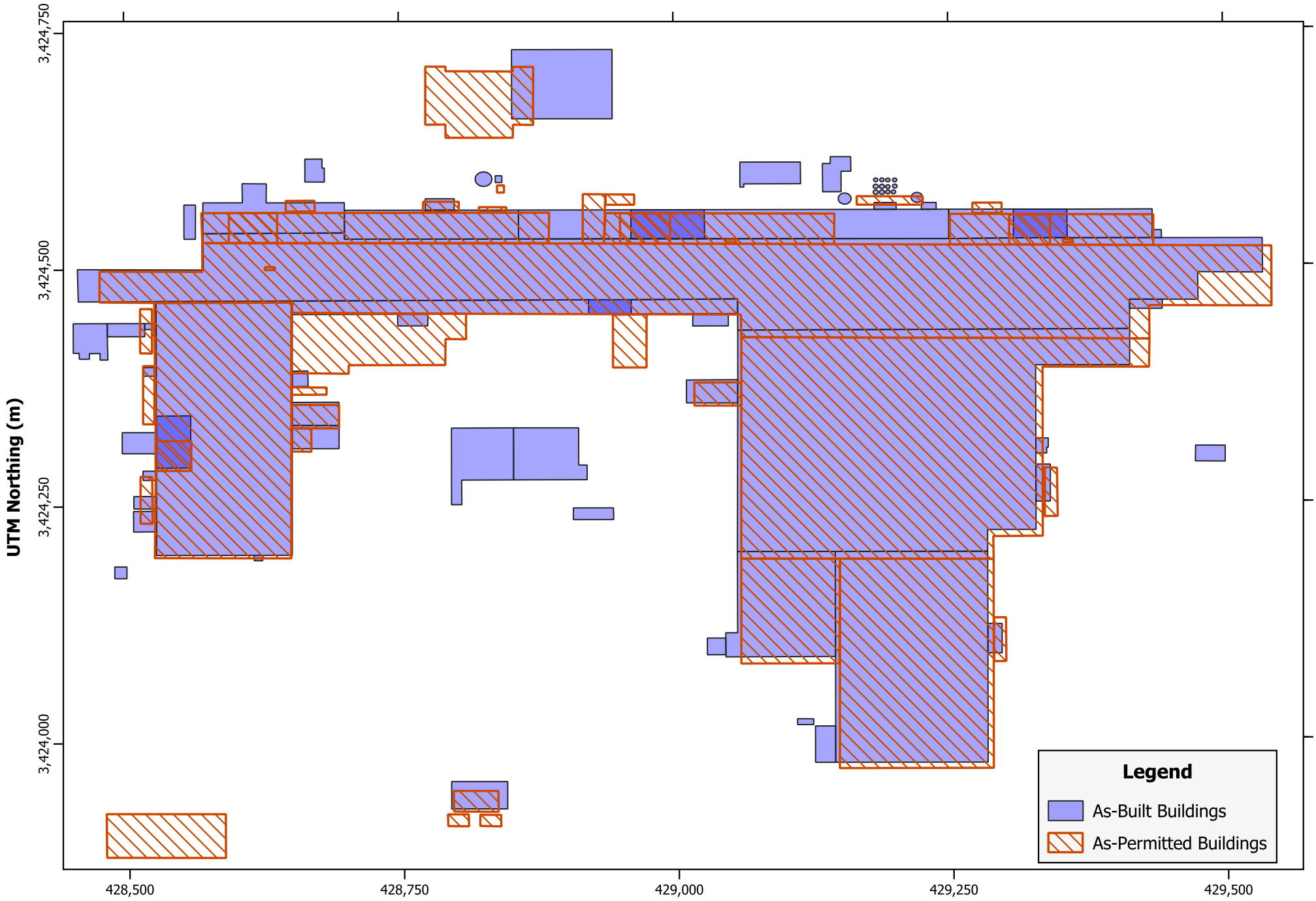
All coordinates shown in UTM Coordinates,
UTM Zone 16, NAD 83 Datum

Figure A-4. Coil Finishing Area As-Built vs As-Permitted Building Layouts



All coordinates shown in UTM Coordinates,
UTM Zone 16, NAD 83 Datum

Figure A-5. Facility-Wide As-Built vs As-Permitted Building Layouts



All coordinates shown in UTM Coordinates,
UTM Zone 16, NAD 83 Datum

APPENDIX B. PROCESS FLOW DIAGRAMS

Facility Operations Overview – Novelis Bay Minette Plant Configuration

Scrap Processing & Melting and Casting Operations

(Refer to Figure B-2 and B-3)

Hot Rolling Operations

(Refer to Figures B-4 and B-5)

Cold Rolling Operations

(Refer to Figure B-6)

Open Market Scrap

Post Industrial Auto./Can Scrap

Runaround Scrap

Scrap Processing Lines #1-3 and Scrap Sorting Line #1 (EU SP-01 to SP-03 & SP-05)

Scrap Proc./ Sorting Reject Materials

Shredded Aluminum Scrap

S-SP-01 to S-SP-03 & S-SP-05

Cold Baghouse #1-#4

Decoaters #1-3 (EU MC-01-MC-03)

Natural Gas

Cyclone Fines Blown to Baghouse

Fines Materials to Waste

S-MC-01

Hot Baghouse #1-#5

From SW #4-5 & #1-2

Decoated Aluminum Scrap

Charge Materials

Natural Gas

Sidewell (SW), NDC & Round-Top Melting Furnaces (8) (EU MC-4-MC-11)

Dross

From SW #3 NDC and Round-Top Furnaces

S-MC-02

Hot Baghouse #6-#9

Alloying Elements

Solid/ Gaseous Flux

Molten Aluminum

Holding Furnaces #1-4 (EU MC-12-MC-15)

Natural Gas

Dross

In-Line Degassers #1-3 (EU MC-16-MC-18)

Gasesous Flux

Dross

DC1-DC4 Casters

Aluminum Ingot

Scalper #1 (EU HR-02)

Scalped Ingots

S-HR-06-HR-08

Pusher Furnaces #1-3 (EU HR-07-HR-09)

Natural Gas

Pre-heated Ingots

S-HR-09 & HR-10

Mist Eliminator #1-2

Hot Rolling Mill (Reversing and Finishing Mills) (EU HR-10-HR-11)

Kerosene-Based Bite Aid

Water/Oil Emulsion-Based Coolant

Hot Rolled Aluminum Coil

Tandem Cold Mill #1 (EU CR-01)

Rolling Oil

Water/Oil Emulsion -Based Coolant

Cold Rolled Aluminum Coil

S-CR-01

Condenser

Water/Glycol Cooling Fluid "Closed-Loop" Chiller and Supply System

Mist Eliminator #3

Tension Leveler (Can Coating Line) (EU CF-01)

Lubricant

Uncaptured VOC Emissions Building Interior

Aluminum Strip

Alkaline Cleaning Line #1 (Can Coating Line) (EU CF-02)

Cleaning Solution and Rinsing Water

Demister/ Scrubber #1

S-CF-01

Cleaned Aluminum Strip

Coating Line #1 (EU CF-03)

Natural gas

Coating

RTO #1

S-CF-02

Uncaptured VOC and PM Emissions Building Interior

Coated Coil to Packaging and Shipping

Edge Trimmer – Electrostatic Oiler (EU CF-04)

Lubricant

Pre-Lube Aluminum Strip

Edge Trimmer

Trimmed Coil to Packaging and Shipping

Trim Scrap

S-CF-04

Demister/ Scrubber #2

Edge Trimmer - Scrap Baller (EU CF-05)

Balled Scrap

S-HR-01

Filtration Unit #4

Scalper Cyclones #1-#2

Scalper Chips

Scalper Chips

Chip Bins (8)

Scalper Chips

S-HR-02

Scalper Chip Handling System Pneumatic Conv. For Briquetter (HR-03)

Briquettes to Melting Furnaces

* Process flow diagram is not comprehensive of the entire proposed equipment scope and excludes auxiliary equipment

Novelis Corporation
Bay Minette, Alabama

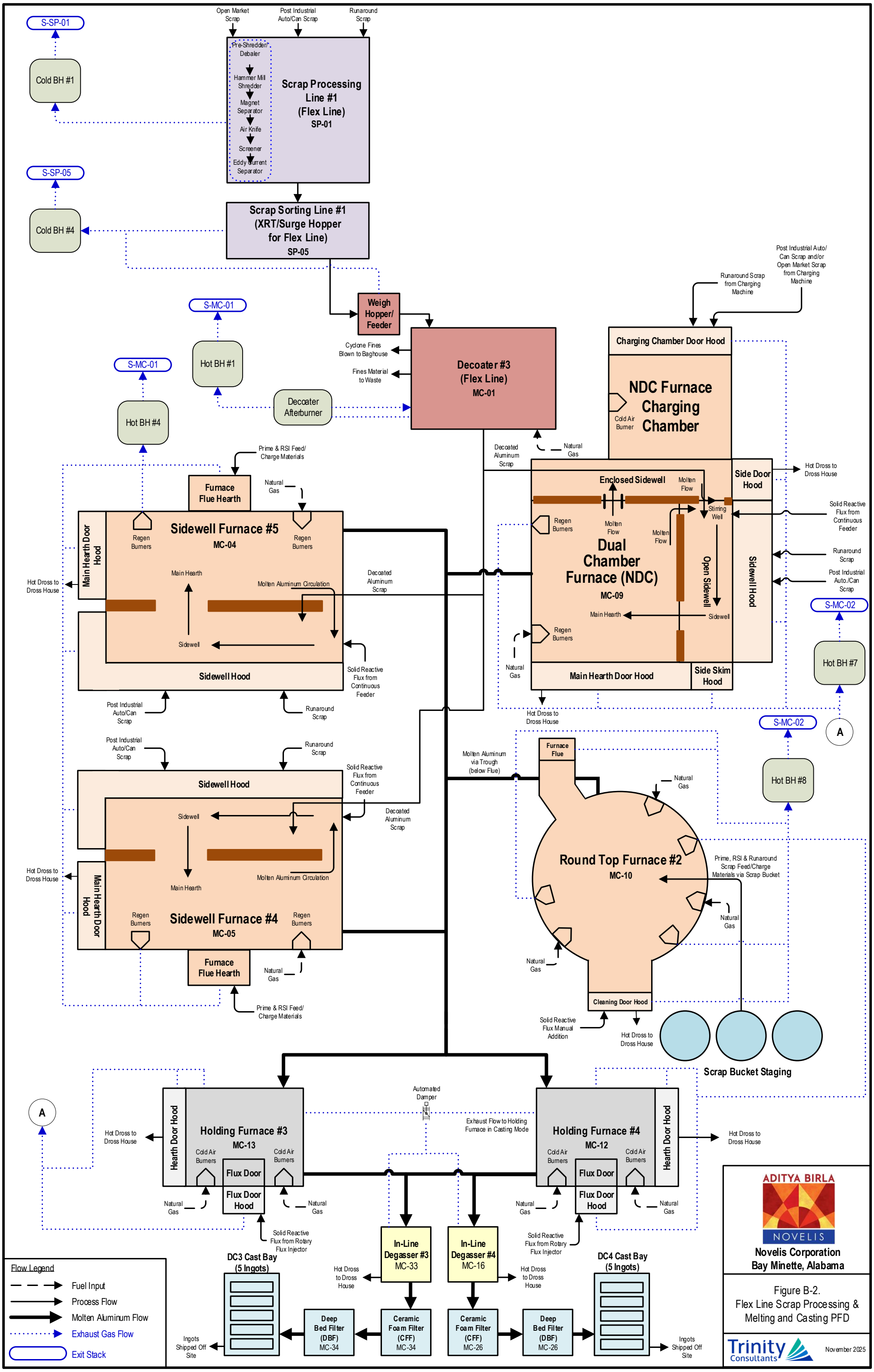
Figure B-1
Facility Overview Diagram-Plant Configuration

Flow Legend
- Process Flow
- Gaseous or Emissions Flow

Trinity Consultants

November 2025

Novelis Bay Minette PFD s.vsd (2025-1125).vsd


Open Market Scrap
Post Industrial Auto/Can Scrap
Runaround Scrap
Pre-Shredder/ Debaler
Hammer Mill Shredder
Magnet Separator
Air Knife
Screener
Eddy Current Separator
Scrap Processing Line #1 (Flex Line)
SP-01
S-SP-01
Cold BH #1
S-SP-05
Cold BH #4
Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line)
SP-05
Weigh Hopper/ Feeder
Cyclone Fines Blown to Baghouse
Fines Material to Waste
Decoater #3 (Flex Line)
MC-01
S-MC-01
Hot BH #1
S-MC-01
Hot BH #4
Decoater Afterburner
Prime & RSI Feed/ Charge Materials
Natural Gas
Furnace Flue Hearth
Sidewell Furnace #5
MC-04
Regen Burners
Main Hearth Door Hood
Main Hearth
Molten Aluminum Circulation
Sidewell
Sidewell Hood
Hot Dross to Dross House
Decoated Aluminum Scrap
Solid Reactive Flux from Continuous Feeder
Post Industrial Auto/Can Scrap
Runaround Scrap
Sidewell Furnace #4
MC-05
Furnace Flue Hearth
Prime & RSI Feed/ Charge Materials
Decoated Aluminum Scrap
Natural Gas
Charging Chamber Door Hood
NDC Furnace Charging Chamber
Cold Air Burner
Post Industrial Auto/ Can Scrap and/or Open Market Scrap from Charging Machine
Runaround Scrap from Charging Machine
Dual Chamber Furnace (NDC)
MC-09
Enclosed Sidewell
Molten Flow
Stirring Well
Open Sidewell
Side Door Hood
Sidewell Hood
Main Hearth Door Hood
Side Skim Hood
Hot Dross to Dross House
Solid Reactive Flux from Continuous Feeder
Runaround Scrap
Post Industrial Auto./Can Scrap
S-MC-02
Hot BH #7
S-MC-02
Hot BH #8
A
Molten Aluminum via Trough (below Flue)
Furnace Flue
Round Top Furnace #2
MC-10
Prime, RSI & Runaround Scrap Feed/Charge Materials via Scrap Bucket
Cleaning Door Hood
Solid Reactive Flux Manual Addition
Scrap Bucket Staging
A
Hearth Door Hood
Holding Furnace #3
MC-13
Holding Furnace #4
MC-12
Cold Air Burners
Flux Door
Flux Door Hood
Automated Damper
Exhaust Flow to Holding Furnace in Casting Mode
Solid Reactive Flux from Rotary Flux Injector
In-Line Degasser #3
MC-33
In-Line Degasser #4
MC-16
Hot Dross to Dross House
DC3 Cast Bay (5 Ingots)
DC4 Cast Bay (5 Ingots)
Deep Bed Filter (DBF)
MC-34
MC-26
Ceramic Foam Filter (CFF)
Ingots Shipped Off Site
Flow Legend
Fuel Input
Process Flow
Molten Aluminum Flow
Exhaust Gas Flow
Exit Stack
Novelis Corporation
Bay Minette, Alabama
Figure B-2.
Flex Line Scrap Processing & Melting and Casting PFD
Trinity Consultants
November 2025

S-SP-02
Cold BH #2
Open Market Scrap
Post Industrial Can Scrap
Runaround Scrap
Pre-Shredder/ Debaler
Hammer Mill Shredder
Magnet Separator
Air Knife
Eddy Current Separator
Scrap Processing Line #2 (CBS Line – UBC) SP-02
Post Industrial Can Scrap
Quad Shaft Shredder
Transfer Conveyor
Scrap Processing Line #3 (CBS Line – Class 1 & 3) SP-03
S-SP-03
Cold BH #3
Shredded Aluminum Scrap
Shredded Aluminum Scrap
S-MC-01
Hot BH #2
Weigh Hopper/ Feeder
Cyclone Fines Blown to Baghouse
Fines Material to Waste
Decoater #2 MC-02
Decoater Afterburner
S-MC-01
Hot BH #3
Weigh Hopper/ Feeder
Cyclone Fines Blown to Baghouse
Fines Material to Waste
Decoater #1 MC-03
Decoater Afterburner
S-MC-01
Hot BH #5
Hot Dross from Melting and Holding Furnaces
Dross House MC-21
Dross Shipments
Natural Gas
Natural Gas
S-MC-02
Hot BH #6
Prime & RSI Feed/ Charge Materials
Prime & RSI Feed/ Charge Materials
Furnace Flue Hearth
Natural Gas
Natural Gas
Furnace Flue Hearth
A
Main Hearth Door Hood
Regen Burners
Sidewell Furnace #2 MC-06
Regen Burners
Main Hearth
Molten Aluminum Circulation
Hot Dross to Dross House
Decoated Aluminum Scrap
Sidewell
Sidewell Hood
Solid Reactive Flux from Continuous Feeder
Post Industrial Can Scrap
Runaround Scrap
Regen Burners
Sidewell Furnace #3 MC-08
Regen Burners
Main Hearth
Molten Aluminum Circulation
Main Hearth Door Hood
Hot Dross to Dross House
Sidewell
Sidewell Hood
Runaround Scrap
Post Industrial Can Scrap
Post Industrial Can Scrap
Runaround Scrap
Solid Reactive Flux from Continuous Feeder
Sidewell Hood
Sidewell
Decoated Aluminum Scrap
Hot Dross to Dross House
Main Hearth Door Hood
Main Hearth
Molten Aluminum Circulation
Regen Burners
Sidewell Furnace #1 MC-07
Regen Burners
Furnace Flue Hearth
Natural Gas
Prime & RSI Feed/ Charge Materials
S-MC-02
Hot BH #9
Molten Aluminum via Trough (below Flue)
Furnace Flue
Natural Gas
Round Top Furnace #1 MC-11
Prime, RSI & Runaround Scrap Feed/Charge Materials via Scrap Bucket
Natural Gas
Natural Gas
Cleaning Door Hood
Solid Reactive Flux Manual Addition
Hot Dross to Dross House
Scrap Bucket Staging
A
Hearth Door Hood
Holding Furnace #2 MC-14
Cold Air Burners
Flux Door
Flux Door Hood
Cold Air Burners
Hot Dross to Dross House
Exhaust Flow to Holding Furnace
Exhaust Flow to Holding Furnace
Holding Furnace #1 MC-15
Cold Air Burners
Flux Door
Flux Door Hood
Cold Air Burners
Hearth Door Hood
Hot Dross to Dross House
Natural Gas
Natural Gas
Natural Gas
Natural Gas
Solid Reactive Flux from Rotary Flux Injector
Solid Reactive Flux from Rotary Flux Injector
In-Line Degasser #2 MC-17
In-Line Degasser #1 MC-18
Hot Dross to Dross House
Hot Dross to Dross House
DC2 Cast Bay (5 Ingots)
DC1 Cast Bay (5 Ingots)
Deep Bed Filter (DBF) MC-27
Ceramic Foam Filter (CFF) MC-27
Ceramic Foam Filter (CFF) MC-28
Deep Bed Filter (DBF) MC-28
Ingots Shipped Off Site
Ingots Shipped Off Site

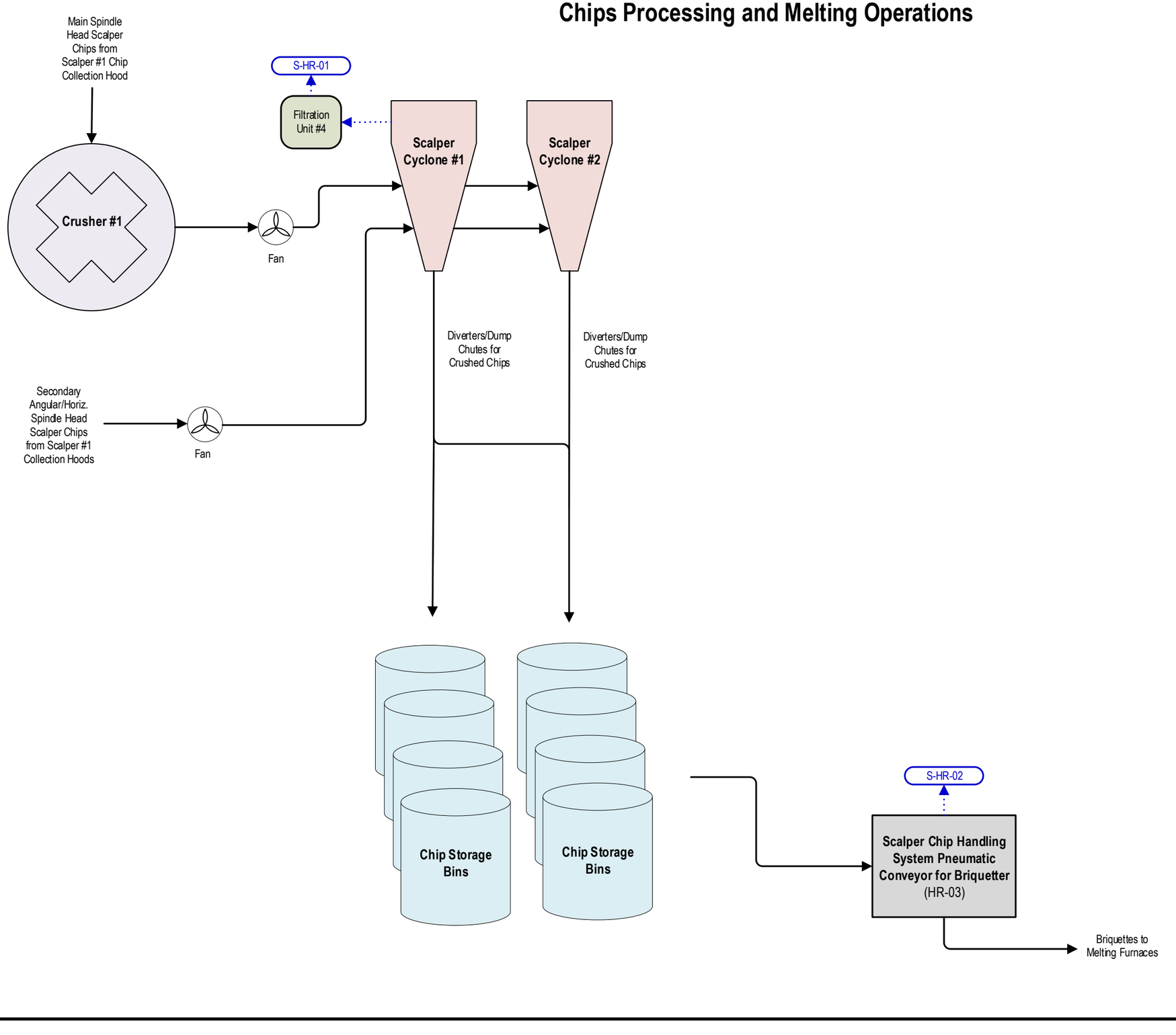
Flow Legend
Fuel Input
Process Flow
Molten Aluminum Flow
Exhaust Gas Flow
Exit Stack

ADITYA BIRLA
NOVELIS
Novelis Corporation
Bay Minette, Alabama

Figure B-3.
Can Body Stock (CBS) Scrap Processing & Melting and Casting PFD

Trinity Consultants
November 2025

Chips Processing and Melting Operations



ADITYA BIRLA
NOVELIS

Novelis Corporation
Bay Minette, Alabama

Figure B-4
Chips Processing and Melting Operations PFD

Trinity Consultants

November 2025

Hot Rolling Mill Operations

Hot Reversing Mill (HR-10)

Hot Finishing Mill (HR-11)

Uncaptured Emissions to Building Interior

S-HR-09

Mist Eliminator #1

S-HR-10

Mist Eliminator #2

Blower

Fume Collection Hood

Vertical Edger

Edger (2)

Mill Stand

Heavy Shear

Light Shear

Mill Housing

Trimming Shear

Exit Coiler

Rolled Coil to Cold Rolling Area

Pre-heated Ingots

Roll Table

Pinch Rolls

Mill Pan

Clean Coolant

Make-up Base Oil & Additives from Premix Tank

Demineralized Water

Used Coolant

Sump Tank

HRM Emulsion Main Tank

Dirty Chamber

Intermediate Chamber

Clean Chamber

Vacuum Filters (2)

Additives from Additive Tank

Recycled Coolant

Make-up Base Oil from Base Oil Tank

Electric Heaters

Non-Contact Heat Exchanger

Cooling Water

Sump Tank (Return Tank)

HRM Emulsion Main Tanks #1/#2

Vacuum Filters (5)

Flow Legend

- Process Flow
- Coolant Flow
- Bite Aid Flow
- Exhaust Gas Flow
- Air Flow

ADITYA BIRLA NOVELIS

Novelis Corporation
Bay Minette, Alabama

Figure B-5
Hot Rolling Mills PFD

Trinity Consultants

November 2025

Novelis Bay Minette PFD.vsd (2025-1125).vsd

Water/Glycol Cooling Fluid "Closed-Loop" Chiller and Supply System

S-CR-01

Condenser

Mist Eliminator #3

Mill Housing

Tandem Cold Mill #1 (CR-01)

Fume Collection Hood

Hot Edge Spray (HES) System

Forward Roller

Coil Roller

Mill Stand Collection Pan #1

Mill Stand Collection Pan #2

Coolant Collection

TCM Emulsion Main Tank

Heat Exchanger

Cooling Water

Electric Heater

Dirty Section

Clean Section

Water

Clean Coolant Pumps

Filter

TCM Main Oil Separation Tank

Filter Paper To Coolant Filtration

Multi Plate Precoat Filter

TCM Rolling Oil System Tank

Purchased Base Rolling Oil

Used Filter Paper To Waste

Circulation Section

Dirty Section

Clean Section

Electric Heater

TCM Multi-Plate Filter Mixing Tank 1

TCM Multi-Plate Filter Mixing Tank 2

Hot Rolling Oil Spray System

Heat Exchanger

Cooling water

To Vacuum Distillation Unit (VDU)

From VDU

Cartridge & Bag Filter

Cartridge Filter

TCM HES System Main Oil Tank

Electric Heater

Rolling Oil Separator Tank

Vacuum Filter

ADITYA BIRLA

NOVELIS

Novelis Corporation
Bay Minette, Alabama

Flow Legend

- Fresh Coolant
- Dirty Coolant
- Recycled Coolant
- Gaseous or Emissions
- Cooling Water
- Water

Figure B-6
Cold Rolling Mill PFD

Trinity Consultants

November 2025

APPENDIX C. SUPPORTING EMISSIONS DOCUMENTATION

1. Project Emissions Summary

Table 1-1.1 tallies the project emission increases from the proposed greenfield integrated rolling mill covered by this permit application. For new emission units, values are the future potential emissions, taking into account inherent operating limitations and control device configurations. As-built changes are denoted in light green highlights and dark red text. Table 1-1.2 provides the as-permitted annual potential emissions values for comparison to the as-built values, and Table 1.1-3 shows the changes in annual potential emissions for previously permitted emission units between the as-permitted and as-built configurations.

Table 1-1.1 Project Emissions Increases for Regulated NSR Pollutants (As-Built Configuration)

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
SP-01	X001	Scrap Processing Line #1 (Flex Line)	24.78	12.64	3.72	--	--	--	--	--	--	0.39
SP-02	X002	Scrap Processing Line #2 (CBS Line - UBC)	23.28	11.87	3.49	--	--	--	--	--	--	0.36
SP-03	X002	Scrap Processing Line #3 (CBS Line - Class 1 & 3)	9.07	4.63	1.36	--	--	--	--	--	--	0.14
~~SP-04~~	~~X001~~	~~Scrap Processing Line #4 (LIBS Line)~~	--	--	--	--	--	--	--	--	--	--
SP-05	X001	Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line)	8.26	4.21	1.24	--	--	--	--	--	--	0.13
MC-01	X003	Decoater #3 (Flex Line)	7.08	23.46	22.75	38.62	34.06	20.05	0.079	52,290	3.02E-03	45.19
MC-02	X004	Decoater #2 (CBS Line)	4.23	20.83	20.41	38.62	34.06	20.05	0.079	52,290	1.83E-03	45.19
MC-03	X005	Decoater #1 (CBS Line)	7.40	23.75	23.01	38.62	34.06	20.05	0.079	52,290	3.15E-03	45.19
MC-04	X006	Sidewell Melting Furnace #5 (Flex Line)	5.18	17.05	15.20	37.04	35.72	23.82	0.100	19,490	2.53E-04	2.90
MC-05	X006	Sidewell Melting Furnace #4 (Flex Line)	5.18	17.05	15.20	37.04	35.72	23.82	0.100	19,490	2.53E-04	2.90
MC-06	X007	Sidewell Melting Furnace #2 (CBS Line)	5.18	17.05	15.20	37.04	35.72	23.82	0.100	19,490	2.53E-04	2.90
MC-07	X007	Sidewell Melting Furnace #1 (CBS Line)	5.18	17.05	15.20	37.04	35.72	23.82	0.100	19,490	2.53E-04	2.90
MC-08	X008	Sidewell Melting Furnace #3 (CBS Line)	4.85	16.81	15.09	37.04	35.72	23.82	0.100	19,490	2.42E-04	2.90
MC-09	X009	Novelis Dual Chamber (NDC) Recycle Furnace #1 (Flex Line)	9.18	21.71	18.45	61.29	45.70	27.46	0.16	67,215	4.30E-04	10.94
MC-10	X010	Round Top Furnace #2 (Flex Line)	4.85	15.78	15.46	60.56	40.22	14.43	0.29	57,443	2.45E-04	4.51
MC-11	X011	Round Top Furnace #1 (CBS Line)	4.85	15.78	15.46	60.56	40.22	14.43	0.29	57,443	2.45E-04	4.51
MC-12	X010	Holding Furnace #4 (Flex Line)	3.28	6.39	6.17	8.99	9.93	8.31	0.071	13,848	1.66E-04	8.39
MC-13	X009	Holding Furnace #3 (Flex Line)	3.46	6.55	6.32	8.99	9.93	8.31	0.071	13,848	1.72E-04	8.39
MC-14	X008	Holding Furnace #2 (CBS Line)	3.25	6.27	6.05	8.99	9.93	8.08	0.071	13,848	1.65E-04	8.17
MC-15	X011	Holding Furnace #1 (CBS Line)	3.28	6.30	6.08	8.99	9.93	8.08	0.071	13,848	1.66E-04	8.17
MC-16	X010	In-Line Degasser #4 (Flex Line)	2.68	1.43	0.53	--	--	--	--	--	--	10.72
MC-33	**X009**	**In-Line Degasser #3 (Flex Line)**	**2.68**	**1.43**	**0.53**	**--**	**--**	**--**	**--**	**--**	**--**	**10.72**
MC-17	X008	In-Line Degasser #2 (CBS Line)	2.61	1.39	0.52	--	--	--	--	--	--	10.43
MC-18	X011	In-Line Degasser #1 (CBS Line)	2.61	1.39	0.52	--	--	--	--	--	--	10.43
MC-19	X006	Sow Dryer #2 (Flex Line)	0.17	0.30	0.30	9.57	6.39	0.48	0.053	10,258	4.38E-05	0.17
MC-20	X007	Sow Dryer #1 (CBS Line)	0.17	0.30	0.30	9.57	6.39	0.48	0.053	10,258	4.38E-05	0.17
MC-21	X004	Dross House	6.77	6.36	5.28	--	--	--	--	--	--	--
MC-22	X009	Dross Press #2 (Flex Line)	0.73	0.69	0.57	--	--	--	--	--	--	--
~~MC-23~~	~~X009~~	~~Dross Press #2 (Flex Line)~~	--	--	--	--	--	--	--	--	--	--
MC-24	X008	Dross Press #1 (CBS Line)	0.73	0.69	0.57	--	--	--	--	--	--	--

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
~~MC-25~~	~~X008~~	~~Dross Press #4 (CBS Line)~~	--	--	--	--	--	--	--	--	--	--
MC-26	Insign.	Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC4 (Flex Line)	0.053	0.096	0.096	2.11	2.33	0.15	0.017	3,241	1.38E-05	0.052
MC-34	**Insign.**	**Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC3 (Flex Line)**	**0.053**	**0.096**	**0.096**	**2.11**	**2.33**	**0.15**	**0.017**	**3,241**	**1.38E-05**	**0.052**
MC-27	Insign.	Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC2 (CBS Line)	0.053	0.096	0.096	2.11	2.33	0.15	0.017	3,241	1.38E-05	0.052
MC-28	Insign.	Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC1 (CBS Line)	0.053	0.096	0.096	2.11	2.33	0.15	0.017	3,241	1.38E-05	0.052
~~MC-29~~	~~Insign.~~	~~Trough Heaters (Flex Line)~~	--	--	--	--	--	--	--	--	--	--
~~MC-30~~	~~Insign.~~	~~Trough Heaters (CBS Line)~~	--	--	--	--	--	--	--	--	--	--
MC-35	**Insign.**	**Molten Metal Utility Heaters**	**0.14**	**0.25**	**0.25**	**7.25**	**6.09**	**0.40**	**0.044**	**8,493**	**3.63E-05**	**0.14**
MC-31	Insign.	DC1-DC4 Casting Unit- Lubricant Usage	--	--	--	--	--	1.43	--	--	--	--
MC-32	X012	Melting & Casting Ingot Saw	4.71E-03	4.71E-03	4.71E-03	--	--	1.13	--	--	--	9.18E-05
~~HR-01~~	~~X012~~	~~Hot Rolling Ingot Saws (4)~~	--	--	--	--	--	--	--	--	--	--
HR-02	X013	Scalper #1	1.11	1.11	1.11	--	--	34.42	--	--	--	0.022
HR-03	X013	Scalper Chip Handling System Pneumatic Conveyor for Briquetter	0.32	0.16	0.16	--	--	--	--	--	--	6.17E-03
~~HR-04~~	~~X013~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #2 (Flex Line)~~	--	--	--	--	--	--	--	--	--	--
~~HR-05~~	~~X013~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #3 (CBS Line)~~	--	--	--	--	--	--	--	--	--	--
~~HR-06~~	~~X013~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #4 (CBS Line)~~	--	--	--	--	--	--	--	--	--	--
HR-07	X014	Pusher Furnace #1	1.19	1.48	1.48	29.18	14.21	0.90	0.13	25,012	1.07E-04	0.40
HR-08	X014	Pusher Furnace #2	1.19	1.48	1.48	29.18	14.21	0.90	0.13	25,012	1.07E-04	0.40
HR-09	X014	Pusher Furnace #3	1.19	1.48	1.48	29.18	14.21	0.90	0.13	25,012	1.07E-04	0.40
HR-10	X015	Hot Reversing Mill	10.14	22.20	20.38	--	--	44.40	--	--	--	--
HR-11	X016	Hot Finishing Mill	19.90	44.95	40.57	--	--	167.9	--	--	--	--
CR-01	X017	Tandem Cold Mill #1	8.43	7.89	6.94	--	--	87.97	--	--	--	--
CF-01	X018	Tension Leveler (Can Coating Line)	--	--	--	--	--	12.59	--	--	--	--
CF-02	X018	Alkaline Cleaning Line #1 (Can Coating Line)	0.63	0.63	0.63	--	--	0.36	--	--	--	--
CF-03	X018	Coating Line #1	11.95	11.56	9.71	28.97	57.94	12.65	0.12	22,598	9.65E-05	11.95
CF-04	**TBD**	**Edge Trimmer- Electrostatic Oiler**	**2.49**	**2.49**	**2.49**	**--**	**--**	**8.41**	**--**	**--**	**--**	**--**
CF-05	**TBD**	**Edge Trimmer- Scrap Baller**	**1.18**	**1.18**	**1.18**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
~~AS-01~~	~~X019~~	~~Hot Water Boiler #1~~	--	--	--	--	--	--	--	--	--	--
~~AS-02~~	~~X019~~	~~Hot Water Boiler #2~~	--	--	--	--	--	--	--	--	--	--
~~AS-03~~	~~X019~~	~~Hot Water Boiler #3~~	--	--	--	--	--	--	--	--	--	--
AS-04	X020	Caster Cooling Tower #1	0.23	0.11	5.42E-04	--	--	--	--	--	--	--
AS-05	X020	**Hot Mill Cooling Tower**	0.39	0.18	9.22E-04	--	--	--	--	--	--	--
AS-26	**X020**	**Cold Mill Cooling Tower**	**0.26**	**0.12**	**6.15E-04**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-27	**X020**	**Finishing Cooling Tower**	**0.021**	**9.99E-03**	**5.02E-05**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-28	**X020**	**Round Tops/Pushers Cooling Tower**	**0.031**	**0.014**	**7.17E-05**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-06	X021	Emergency Generator Engine #1 (Security Office)	5.99E-03	5.99E-03	5.99E-03	0.025	0.050	3.75E-03	3.53E-04	70.20	3.00E-07	0.067

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
AS-07	X021	Emergency Generator Engine #2 (Admin. Building)	5.99E-03	5.99E-03	5.99E-03	0.025	0.050	3.75E-03	3.53E-04	70.20	3.00E-07	0.067
~~AS-08~~	~~X021~~	~~Emergency Generator Engine #3 (Remelt- Cold End)~~	--	--	--	--	--	--	--	--	--	--
~~AS-09~~	~~X021~~	~~Emergency Generator Engine #4 (Remelt- Hot End)~~	--	--	--	--	--	--	--	--	--	--
AS-10	X021	Emergency Generator Engine #5 (Hot Reversing Mill)	3.47E-03	3.47E-03	3.47E-03	0.18	0.35	0.089	2.04E-04	40.66	1.74E-07	0.039
AS-11	X021	Emergency Generator Engine #6 (Hot Finishing Mill)	4.91E-03	4.91E-03	4.91E-03	0.29	0.58	0.14	2.89E-04	57.52	2.46E-07	0.055
AS-12	X021	Emergency Generator Engine #7 (Cold Mill)	4.91E-03	4.91E-03	4.91E-03	0.29	0.58	0.14	2.89E-04	57.52	2.46E-07	0.055
~~AS-13~~	~~X021~~	~~Emergency Generator Engine #8 (Coating Line)~~	--	--	--	--	--	--	--	--	--	--
~~AS-14~~	~~X021~~	~~Emergency Generator Engine #9 (Edge Trimmer)~~	--	--	--	--	--	--	--	--	--	--
AS-29	**X021**	**Emergency Generator Engine #10 (Maintenance Bldg)**	**5.99E-03**	**5.99E-03**	**5.99E-03**	**0.025**	**0.050**	**3.75E-03**	**3.53E-04**	**70.20**	**3.00E-07**	**0.067**
AS-30	**X021**	**Emergency Generator Engine #11 (Decoater #1)**	**2.06E-03**	**2.06E-03**	**2.06E-03**	**0.060**	**2.57**	**0.021**	**6.23E-05**	**12.41**	**5.30E-08**	**0.012**
AS-31	**X021**	**Emergency Generator Engine #12 (Decoater #2)**	**2.06E-03**	**2.06E-03**	**2.06E-03**	**0.060**	**2.57**	**0.021**	**6.23E-05**	**12.41**	**5.30E-08**	**0.012**
AS-32	**X021**	**Emergency Generator Engine #13 (Decoater #3)**	**2.06E-03**	**2.06E-03**	**2.06E-03**	**0.060**	**2.57**	**0.021**	**6.23E-05**	**12.41**	**5.30E-08**	**0.012**
AS-15	X021	Fire Pump Engine #1 (North Pump House)	0.031	0.031	0.031	1.03	0.15	0.027	1.99E-03	215.2	1.18E-05	5.25E-03
~~AS-16~~	~~X021~~	~~Fire Pump Engine #2 (South Pump House)~~	--	--	--	--	--	--	--	--	--	--
AS-17	X021	Fire Pump Engine #3 (West Pump House)	0.019	0.019	0.019	0.73	0.096	0.020	1.73E-03	186.9	1.03E-05	4.56E-03
AS-18	X021	Fire Pump Engine #4 (West Pump House)	0.019	0.019	0.019	0.73	0.096	0.020	1.73E-03	186.9	1.03E-05	4.56E-03
AS-19a to AS-19h	TBD	Building Heating Systems	0.46	0.84	0.84	24.33	20.44	1.34	0.15	28,494	1.22E-04	0.46
AS-20	Insign.	**Hot Baghouses Lime Silos (5)**	0.014	0.014	0.014	--	--	--	--	--	--	--
AS-33	**Insign.**	**Cold Baghouse Dry Sorbent Silos (2)**	**3.85E-05**	**3.85E-05**	**3.85E-05**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-21	Insign.	**Diesel Fuel Storage and Refueling Stations (4)**	--	--	--	--	--	**8.92E-03**	--	--	--	--
AS-22	Insign.	**Hot Rolling Area Storage Tanks (14)**	--	--	--	--	--	**4.14**	--	--	--	--
AS-23	Insign.	**Cold Rolling Area Storage Tanks (13)**	--	--	--	--	--	**7.51E-03**	--	--	--	--
AS-24	Insign.	**Coil Finishing Area Storage Tanks (22)**	--	--	--	--	--	**0.27**	--	--	--	**0.23**
AS-25	X022	Paved Haul Roads	**23.72**	**4.74**	**1.16**	--	--	--	--	--	--	--
AS-34	**Insign.**	**Anodizing Test Unit**	**5.34E-04**	**5.34E-04**	**5.34E-04**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-35	**Insign.**	**Filtering Aid Material Handling**	**1.26E-03**	**5.95E-04**	**9.00E-05**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-36	**Insign.**	**Cold Mill Coil Marking Machine**	**--**	**--**	**--**	**--**	**--**	**2.73**	**--**	**--**	**--**	**--**
AS-37	**Insign.**	**Mill Roll Grinding Machines (3)**	**--**	**--**	**--**	**--**	**--**	**4.25**	**--**	**--**	**--**	**--**
AS-38	**Insign.**	**Coil Finishing Roll Grinding Machine**	**0.67**	**0.67**	**0.67**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-39	**Insign.**	**Bearings Washing Machine**	**--**	**--**	**--**	**--**	**--**	**1.79**	**--**	**--**	**--**	**--**
AS-40	**Insign.**	**Hot Mill Parts Washing Bay**	**--**	**--**	**--**	**--**	**--**	**1.80**	**--**	**--**	**--**	**--**
AS-41	**Insign.**	**Roll Shop Parts Washers (4)**	**--**	**--**	**--**	**--**	**--**	**0.53**	**--**	**--**	**--**	**--**
AS-42	**Insign.**	**Maintenance Parts Washers (7)**	**--**	**--**	**--**	**--**	**--**	**3.04**	**--**	**--**	**--**	**--**
AS-43a	**Insign.**	**WWTP- Hot Mill Oil Tanks (2)**	**--**	**--**	**--**	**--**	**--**	**7.40E-03**	**--**	**--**	**--**	**--**

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
AS-43b	Insign.	WWTP- Cold Mill Oil Tank	--	--	--	--	--	0.016	--	--	--	--
AS-43c	Insign.	WWTP- Hot Mill DAF	--	--	--	--	--	0.016	--	--	--	--
AS-43d	Insign.	WWTP- Cold Mill DAF	--	--	--	--	--	1.61E-03	--	--	--	--
Project Emissions Increase by Process Area												
		01. Scrap Processing	65.39	33.35	9.81	--	--	--	--	--	--	1.02
		02. Melting and Casting	95.92	246.4	225.8	554.3	474.8	272.9	1.98	533,788	0.011	246.1
		03. Hot Rolling	35.03	72.87	66.66	87.53	42.62	249.4	0.38	75,036	3.20E-04	1.24
		04. Cold Rolling	8.43	7.89	6.94	--	--	87.97	--	--	--	--
		05. Coil Finishing	16.25	15.86	14.00	28.97	57.94	34.01	0.12	22,598	9.65E-05	11.95
		06. Auxiliary Systems	25.92	6.82	2.81	27.84	30.16	20.47	0.15	29,486	1.56E-04	1.09
Total Project Emissions Increase			**246.9**	**383.2**	**326.1**	**698.6**	**605.5**	**664.7**	**2.63**	**660,908**	**0.012**	**261.4**
PSD Major Source Threshold			100 tpy for Scrap Processing + Melting and Casting & 250 tpy Site-Wide							--	--	--
PSD Significant Emission Rate (SER)			25	15	10	40	100	40	40	75,000	0.6	--
Project Triggers PSD Review?			Y	Y	Y	Y	Y	Y	N	Y	N	--

Table 1-1.2 Project Emissions Increases for Regulated NSR Pollutants (As-Permitted Configuration)

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
SP-01		Scrap Processing Line #1 (Flex Line)	24.84	12.67	3.73	--	--	--	--	--	--	0.39
SP-02		Scrap Processing Line #2 (CBS Line - UBC)	23.28	11.87	3.49	--	--	--	--	--	--	0.36
SP-03		Scrap Processing Line #3 (CBS Line - Class 1 & 3)	7.13	3.64	1.07	--	--	--	--	--	--	0.11
SP-04		Scrap Processing Line #4 (LIBS Line)	6.04	3.08	0.91	--	--	--	--	--	--	0.094
SP-05		Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line)	8.31	4.24	1.25	--	--	--	--	--	--	0.13
MC-01		Decoater #1 (Flex Line)	6.97	25.05	24.35	42.49	36.94	21.97	0.079	55,868	2.97E-03	49.68
MC-02		Decoater #2 (CBS Line)	3.98	22.30	21.90	42.49	36.94	21.97	0.079	55,868	2.97E-03	49.68
MC-03		Decoater #3 (CBS Line)	6.97	25.05	24.35	42.49	36.94	21.97	0.079	55,868	2.97E-03	49.68
MC-04		Sidewell Melting Furnace #1 (Flex Line)	5.10	16.99	15.18	37.38	37.40	23.82	0.100	19,490	2.50E-04	2.90
MC-05		Sidewell Melting Furnace #2 (Flex Line)	5.10	16.99	15.18	37.38	37.40	23.82	0.100	19,490	2.50E-04	2.90
MC-06		Sidewell Melting Furnace #3 (CBS Line)	5.10	16.99	15.18	37.38	37.40	23.82	0.100	19,490	2.50E-04	2.90
MC-07		Sidewell Melting Furnace #4 (CBS Line)	5.10	16.99	15.18	37.38	37.40	23.82	0.100	19,490	2.50E-04	2.90
MC-08		Sidewell Melting Furnace #5 (CBS Line)	5.50	17.27	15.32	37.38	37.40	23.82	0.100	19,490	2.50E-04	2.90
MC-09		Novelis Dual Chamber (NDC) Recycle Furnace #1 (Flex Line)	9.77	20.31	16.84	57.60	47.48	24.48	0.17	65,928	4.63E-04	9.73
MC-10		Round Top Furnace #1 (Flex Line)	5.41	16.26	15.90	65.21	41.18	14.50	0.30	58,982	2.52E-04	4.54
MC-11		Round Top Furnace #2 (CBS Line)	5.41	16.26	15.90	65.21	41.18	14.50	0.30	58,982	2.52E-04	4.54
MC-12		Holding Furnace #1 (Flex Line)	2.47	4.57	4.40	8.21	11.04	5.69	0.079	15,387	1.46E-04	5.84
MC-13		Holding Furnace #2 (Flex Line)	2.47	4.57	4.40	8.21	11.04	5.69	0.079	15,387	1.46E-04	5.84
MC-14		Holding Furnace #3 (CBS Line)	2.97	5.50	5.31	8.21	11.04	6.86	0.079	15,387	1.63E-04	6.99
MC-15		Holding Furnace #4 (CBS Line)	2.97	5.50	5.31	8.21	11.04	6.86	0.079	15,387	1.63E-04	6.99
MC-16		In-Line Degasser #1 (Flex Line)	3.67	1.95	0.73	--	--	--	--	--	--	14.68
MC-17		In-Line Degasser #2 (CBS Line)	2.21	1.18	0.44	--	--	--	--	--	--	8.85
MC-18		In-Line Degasser #3 (CBS Line)	2.21	1.18	0.44	--	--	--	--	--	--	8.85
MC-19		Sow Dryer #1 (Flex Line)	0.17	0.30	0.30	4.73	6.39	0.48	0.053	10,258	4.38E-05	0.17
MC-20		Sow Dryer #2 (CBS Line)	0.17	0.30	0.30	4.73	6.39	0.48	0.053	10,258	4.38E-05	0.17
MC-21		Dross House	7.00	6.58	5.46	--	--	--	--	--	--	--
MC-22		Dross Press #1	0.11	0.11	0.088	--	--	--	--	--	--	--
MC-23		Dross Press #2	0.11	0.11	0.088	--	--	--	--	--	--	--
MC-24		Dross Press #3	0.11	0.11	0.088	--	--	--	--	--	--	--
MC-25		Dross Press #4	0.11	0.11	0.088	--	--	--	--	--	--	--
MC-26		Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC1 (Flex Line)	0.029	0.053	0.053	1.11	1.28	0.084	9.13E-03	1,782	7.61E-06	0.029
MC-27		Deep Bed Filter (DBF) System for DC2 (CBS Line)	0.028	0.051	0.051	1.07	1.24	0.081	8.86E-03	1,728	7.38E-06	0.028
MC-28		Deep Bed Filter (DBF) System for DC3 (CBS Line)	0.028	0.051	0.051	1.07	1.24	0.081	8.86E-03	1,728	7.38E-06	0.028

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
MC-29		Trough Heaters (Flex Line)	6.24E-03	0.011	0.011	0.24	0.28	0.018	1.97E-03	384.7	1.64E-06	6.20E-03
MC-30		Trough Heaters (CBS Line)	6.24E-03	0.011	0.011	0.24	0.28	0.018	1.97E-03	384.7	1.64E-06	6.20E-03
MC-31		DC1-DC3 Casting Unit- Lubricant Usage	--	--	--	--	--	1.07	--	--	--	--
MC-32		Melting & Casting Ingot Saw	5.50E-04	5.50E-04	5.50E-04	--	--	0.14	--	--	--	1.07E-05
HR-01		Hot Rolling Ingot Saws (4)	0.037	0.037	0.037	--	--	4.83	--	--	--	7.15E-04
HR-02		Scalper #1	1.99	1.99	1.99	--	--	34.42	--	--	--	0.039
HR-03		Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #1 (Flex Line)	0.71	0.36	0.36	--	--	--	--	--	--	0.014
HR-04		Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #2 (Flex Line)	0.71	0.36	0.36	--	--	--	--	--	--	0.014
HR-05		Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #3 (CBS Line)	0.71	0.36	0.36	--	--	--	--	--	--	0.014
HR-06		Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #4 (CBS Line)	0.71	0.36	0.36	--	--	--	--	--	--	0.014
HR-07		Pusher Furnace #1	1.19	1.48	1.48	29.18	14.21	0.90	0.13	25,013	1.07E-04	0.40
HR-08		Pusher Furnace #2	1.19	1.48	1.48	29.18	14.21	0.90	0.13	25,013	1.07E-04	0.40
HR-09		Pusher Furnace #3	1.19	1.48	1.48	29.18	14.21	0.90	0.13	25,013	1.07E-04	0.40
HR-10		Hot Reversing Mill	10.39	22.43	20.56	--	--	44.40	--	--	--	--
HR-11		Hot Finishing Mill	20.69	45.64	41.08	--	--	167.9	--	--	--	--
CR-01		Tandem Cold Mill #1	5.27	4.92	4.34	--	--	54.93	--	--	--	--
CF-01		Tension Leveler (Can Coating Line)	--	--	--	--	--	11.03	--	--	--	--
CF-02		Alkaline Cleaning Line #1 (Can Coating Line)	0.86	0.86	0.86	--	--	7.07	--	--	--	--
CF-03		Coating Line #1	18.16	17.76	14.97	43.45	86.91	19.63	0.24	47,779	2.04E-04	18.15
AS-01		Hot Water Boiler #1	0.20	0.37	0.37	5.26	8.83	0.58	0.063	12,309	5.26E-05	0.20
AS-02		Hot Water Boiler #2	0.20	0.37	0.37	5.26	8.83	0.58	0.063	12,309	5.26E-05	0.20
AS-03		Hot Water Boiler #3	0.20	0.37	0.37	5.26	8.83	0.58	0.063	12,309	5.26E-05	0.20
AS-04		Caster Cooling Tower #1	0.17	0.080	3.99E-04	--	--	--	--	--	--	--
AS-05		General Plant Cooling Tower	0.68	0.32	1.59E-03	--	--	--	--	--	--	--
AS-06		Emergency Generator Engine #1 (Security Office)	0.012	0.012	0.012	8.38E-03	0.065	0.010	3.78E-04	75.26	3.21E-07	5.66E-03
AS-07		Emergency Generator Engine #2 (Admin. Building)	0.012	0.012	0.012	8.38E-03	0.065	0.010	3.78E-04	75.26	3.21E-07	5.66E-03
AS-08		Emergency Generator Engine #3 (Remelt- Cold End)	0.012	0.012	0.012	8.38E-03	0.065	0.010	3.78E-04	75.26	3.21E-07	5.66E-03
AS-09		Emergency Generator Engine #4 (Remelt- Hot End)	0.012	0.012	0.012	8.38E-03	0.065	0.010	3.78E-04	75.26	3.21E-07	5.66E-03
AS-10		Emergency Generator Engine #5 (Hot Reversing Mill)	0.012	0.012	0.012	8.38E-03	0.065	0.010	3.78E-04	75.26	3.21E-07	5.66E-03
AS-11		Emergency Generator Engine #6 (Hot Finishing Mill)	0.012	0.012	0.012	8.38E-03	0.065	0.010	3.78E-04	75.26	3.21E-07	5.66E-03
AS-12		Emergency Generator Engine #7 (Cold Mill)	0.012	0.012	0.012	8.38E-03	0.065	0.010	3.78E-04	75.26	3.21E-07	5.66E-03
AS-13		Emergency Generator Engine #8 (Coating Line)	0.012	0.012	0.012	8.38E-03	0.065	0.010	3.78E-04	75.26	3.21E-07	5.66E-03
AS-14		Emergency Generator Engine #9 (Edge Trimmer)	0.012	0.012	0.012	8.38E-03	0.065	0.010	3.78E-04	75.26	3.21E-07	5.66E-03
AS-15		Fire Pump Engine #1 (South Pump House)	0.025	0.025	0.025	1.56	0.17	0.017	2.05E-03	220.9	1.22E-05	5.28E-03
AS-16		Fire Pump Engine #2 (South Pump House)	0.023	0.023	0.023	0.56	0.15	0.019	1.05E-03	113.3	6.23E-06	2.71E-03
AS-17		Fire Pump Engine #3 (West Pump House)	0.025	0.025	0.025	1.56	0.17	0.017	2.05E-03	220.9	1.22E-05	5.28E-03
AS-18		Fire Pump Engine #4 (West Pump House)	0.023	0.023	0.023	0.56	0.15	0.019	1.05E-03	113.3	6.23E-06	2.71E-03

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
AS-19		Building Heating Systems	0.46	0.84	0.84	24.33	20.44	1.34	0.15	28,494	1.22E-04	0.46
AS-20		Hot Baghouses Lime Silos (6)	0.014	0.014	0.014	--	--	--	--	--	--	--
AS-21		Diesel Fuel Storage and Refueling Station	--	--	--	--	--	6.56E-03	--	--	--	--
AS-22		Hot Rolling Area Storage Tanks (16)	--	--	--	--	--	1.01	--	--	--	--
AS-23		Cold Rolling Area Storage Tanks (6)	--	--	--	--	--	0.017	--	--	--	--
AS-24		Coil Finishing Area Storage Tanks (9)	--	--	--	--	--	0.037	--	--	--	0.025
AS-25		Paved Haul Roads	22.82	4.56	1.12	--	--	--	--	--	--	--
Project Emissions Increase by Process Area												
		01. Scrap Processing	69.60	35.49	10.44	--	--	--	--	--	--	--
		02. Melting and Casting	91.27	242.7	222.9	548.4	488.9	266.1	1.96	537,015	0.012	240.8
		03. Hot Rolling	39.52	75.99	69.56	87.53	42.62	254.2	0.38	75,039	3.20E-04	1.30
		04. Cold Rolling	5.27	4.92	4.34	--	--	54.93	--	--	--	--
		05. Coil Finishing	19.02	18.62	15.83	43.45	86.91	37.72	0.24	47,779	2.04E-04	18.15
		06. Auxiliary Systems	24.96	7.12	3.29	44.42	48.17	4.30	0.34	66,768	3.19E-04	1.15
Total Project Emissions Increase			**249.6**	**384.8**	**326.3**	**723.8**	**666.6**	**617.3**	**2.94**	**726,601**	**0.013**	**262.5**
PSD Major Source Threshold		100 tpy for Scrap Processing + Melting and Casting & 250 tpy Site-Wide								--	--	--
PSD Significant Emission Rate (SER)			25	15	10	40	100	40	40	75,000	0.6	--
Project Triggers PSD Review?			Y	Y	Y	Y	Y	Y	N	Y	N	--

Table 1-1.3 Project Emissions Increases for Regulated NSR Pollutants (As-Built vs. As-Permitted Difference)

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
SP-01	X001	Scrap Processing Line #1 (Flex Line)	-0.064	-0.033	-9.63E-03	--	--	--	--	--	--	-1.00E-03
SP-02	X002	Scrap Processing Line #2 (CBS Line - UBC)	3.55E-15	--	--	--	--	--	--	--	--	1.11E-16
SP-03	X002	Scrap Processing Line #3 (CBS Line - Class 1 & 3)	1.94	0.99	0.29	--	--	--	--	--	--	0.030
~~SP-04~~	~~X001~~	~~Scrap Processing Line #4 (LIBS Line)~~	-6.04	-3.08	-0.91	--	--	--	--	--	--	-0.094
SP-05	X001	Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line)	-0.047	-0.024	-7.10E-03	--	--	--	--	--	--	-7.38E-04
MC-01	X003	Decoater #3 (Flex Line)	0.11	-1.59	-1.60	-3.86	-2.88	-1.93	5.26E-04	-3,577	4.82E-05	-4.49
MC-02	X004	Decoater #2 (CBS Line)	0.25	-1.46	-1.49	-3.86	-2.88	-1.93	5.26E-04	-3,577	-1.14E-03	-4.49
MC-03	X005	Decoater #1 (CBS Line)	0.43	-1.30	-1.34	-3.86	-2.88	-1.93	5.26E-04	-3,577	1.80E-04	-4.49
MC-04	X006	Sidewell Melting Furnace #5 (Flex Line)	0.078	0.056	0.028	-0.33	-1.68	2.08E-04	--	-0.11	2.55E-06	3.88E-05
MC-05	X006	Sidewell Melting Furnace #4 (Flex Line)	0.078	0.056	0.028	-0.33	-1.68	2.08E-04	--	-0.11	2.55E-06	3.88E-05
MC-06	X007	Sidewell Melting Furnace #2 (CBS Line)	0.078	0.056	0.028	-0.33	-1.68	2.08E-04	--	-0.11	2.55E-06	3.88E-05
MC-07	X007	Sidewell Melting Furnace #1 (CBS Line)	0.078	0.056	0.028	-0.33	-1.68	2.08E-04	--	-0.11	2.55E-06	3.88E-05
MC-08	X008	Sidewell Melting Furnace #3 (CBS Line)	-0.65	-0.46	-0.23	-0.33	-1.68	2.08E-04	--	-0.11	-8.35E-06	-2.71E-05
MC-09	X009	Novelis Dual Chamber (NDC) Recycle Furnace #1 (Flex Line)	-0.59	1.40	1.61	3.69	-1.79	2.98	-0.016	1,288	-3.26E-05	1.20
MC-10	X010	Round Top Furnace #2 (Flex Line)	-0.56	-0.48	-0.44	-4.65	-0.96	-0.072	-7.88E-03	-1,539	-6.57E-06	-0.025
MC-11	X011	Round Top Furnace #1 (CBS Line)	-0.56	-0.48	-0.44	-4.65	-0.96	-0.072	-7.88E-03	-1,539	-6.57E-06	-0.025
MC-12	X010	Holding Furnace #4 (Flex Line)	0.81	1.83	1.77	0.78	-1.10	2.62	-7.88E-03	-1,539	2.00E-05	2.55
MC-13	X009	Holding Furnace #3 (Flex Line)	0.99	1.98	1.91	0.78	-1.10	2.62	-7.88E-03	-1,539	2.59E-05	2.55
MC-14	X008	Holding Furnace #2 (CBS Line)	0.28	0.77	0.75	0.78	-1.10	1.23	-7.88E-03	-1,539	2.50E-06	1.18
MC-15	X011	Holding Furnace #1 (CBS Line)	0.31	0.79	0.77	0.78	-1.10	1.23	-7.88E-03	-1,539	3.45E-06	1.18
MC-16	X010	In-Line Degasser #4 (Flex Line)	-0.99	-0.53	-0.20	--	--	--	--	--	--	-3.96
MC-33	**X009**	**In-Line Degasser #3 (Flex Line)**	**2.68**	**1.43**	**0.53**	**--**	**--**	**--**	**--**	**--**	**--**	**10.72**
MC-17	X008	In-Line Degasser #2 (CBS Line)	0.40	0.21	0.078	--	--	--	--	--	--	1.58
MC-18	X011	In-Line Degasser #1 (CBS Line)	0.40	0.21	0.078	--	--	--	--	--	--	1.58
MC-19	X006	Sow Dryer #2 (Flex Line)	--	5.55E-17	5.55E-17	4.84	--	5.55E-17	--	-0.058	--	--
MC-20	X007	Sow Dryer #1 (CBS Line)	--	5.55E-17	5.55E-17	4.84	--	5.55E-17	--	-0.058	--	--
MC-21	X004	Dross House	-0.23	-0.22	-0.18	--	--	--	--	--	--	--
MC-22	X009	Dross Press #2 (Flex Line)	0.62	0.58	0.48	--	--	--	--	--	--	--
~~MC-23~~	~~X009~~	~~Dross Press #2 (Flex Line)~~	-0.11	-0.11	-0.088	--	--	--	--	--	--	--
MC-24	X008	Dross Press #1 (CBS Line)	0.62	0.58	0.48	--	--	--	--	--	--	--
~~MC-25~~	~~X008~~	~~Dross Press #4 (CBS Line)~~	-0.11	-0.11	-0.088	--	--	--	--	--	--	--
MC-26	Insign.	Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC4 (Flex Line)	0.024	0.043	0.043	1.00	1.05	0.069	7.48E-03	1,459	6.23E-06	0.024
MC-34	**Insign.**	**Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC3 (Flex Line)**	**0.053**	**0.096**	**0.096**	**2.11**	**2.33**	**0.15**	**0.017**	**3,241**	**1.38E-05**	**0.052**
MC-27	Insign.	Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC2 (CBS Line)	0.025	0.045	0.045	1.04	1.09	0.071	7.75E-03	1,513	6.46E-06	0.024
MC-28	Insign.	Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC1 (CBS Line)	0.025	0.045	0.045	1.04	1.09	0.071	7.75E-03	1,513	6.46E-06	0.024

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
~~MC-29~~	~~Insign.~~	~~Trough Heaters (Flex Line)~~	-6.24E-03	-0.011	-0.011	-0.24	-0.28	-0.018	-1.97E-03	-384.7	-1.64E-06	-6.20E-03
~~MC-30~~	~~Insign.~~	~~Trough Heaters (CBS Line)~~	-6.24E-03	-0.011	-0.011	-0.24	-0.28	-0.018	-1.97E-03	-384.7	-1.64E-06	-6.20E-03
MC-35	**Insign.**	**Molten Metal Utility Heaters**	**0.14**	**0.25**	**0.25**	**7.25**	**6.09**	**0.40**	**0.044**	**8,493**	**3.63E-05**	**0.14**
MC-31	Insign.	DC1-DC4 Casting Unit- Lubricant Usage	--	--	--	--	--	0.36	--	--	--	--
MC-32	X012	Melting & Casting Ingot Saw	4.16E-03	4.16E-03	4.16E-03	--	--	0.98	--	--	--	8.11E-05
~~HR-01~~	~~X012~~	~~Hot Rolling Ingot Saws (4)~~	-0.037	-0.037	-0.037	--	--	-4.83	--	--	--	-7.15E-04
HR-02	X013	Scalper #1	-0.88	-0.88	-0.88	--	--	--	--	--	--	-0.017
HR-03	X013	Scalper Chip Handling System Pneumatic Conveyor for Briquetter	-0.39	-0.20	-0.20	--	--	--	--	--	--	-7.67E-03
~~HR-04~~	~~X013~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #2 (Flex Line)~~	-0.71	-0.36	-0.36	--	--	--	--	--	--	-0.014
~~HR-05~~	~~X013~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #3 (CBS Line)~~	-0.71	-0.36	-0.36	--	--	--	--	--	--	-0.014
~~HR-06~~	~~X013~~	~~Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #4 (CBS Line)~~	-0.71	-0.36	-0.36	--	--	--	--	--	--	-0.014
HR-07	X014	Pusher Furnace #1	--	--	--	-1.02E-03	-4.96E-04	-3.15E-05	-4.48E-06	-1.02	-3.73E-09	-1.41E-05
HR-08	X014	Pusher Furnace #2	--	--	--	-1.02E-03	-4.96E-04	-3.15E-05	-4.48E-06	-1.02	-3.73E-09	-1.41E-05
HR-09	X014	Pusher Furnace #3	--	--	--	-1.02E-03	-4.96E-04	-3.15E-05	-4.48E-06	-1.02	-3.73E-09	-1.41E-05
HR-10	X015	Hot Reversing Mill	-0.26	-0.23	-0.18	--	--	--	--	--	--	--
HR-11	X016	Hot Finishing Mill	-0.79	-0.69	-0.51	--	--	--	--	--	--	--
CR-01	X017	Tandem Cold Mill #1	3.17	2.96	2.61	--	--	33.04	--	--	--	--
CF-01	X018	Tension Leveler (Can Coating Line)	--	--	--	--	--	1.56	--	--	--	--
CF-02	X018	Alkaline Cleaning Line #1 (Can Coating Line)	-0.23	-0.23	-0.23	--	--	-6.70	--	--	--	--
CF-03	X018	Coating Line #1	-6.20	-6.19	-5.27	-14.48	-28.97	-6.98	-0.13	-25,181	-1.08E-04	-6.20
CF-04	**TBD**	**Edge Trimmer- Electrostatic Oiler**	**2.49**	**2.49**	**2.49**	**--**	**--**	**8.41**	**--**	**--**	**--**	**--**
CF-05	**TBD**	**Edge Trimmer- Scrap Baller**	**1.18**	**1.18**	**1.18**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
~~AS-01~~	~~X019~~	~~Hot Water Boiler #1~~	-0.20	-0.37	-0.37	-5.26	-8.83	-0.58	-0.063	-12,309	-5.26E-05	-0.20
~~AS-02~~	~~X019~~	~~Hot Water Boiler #2~~	-0.20	-0.37	-0.37	-5.26	-8.83	-0.58	-0.063	-12,309	-5.26E-05	-0.20
~~AS-03~~	~~X019~~	~~Hot Water Boiler #3~~	-0.20	-0.37	-0.37	-5.26	-8.83	-0.58	-0.063	-12,309	-5.26E-05	-0.20
AS-04	X020	Caster Cooling Tower #1	0.061	0.028	1.42E-04	--	--	--	--	--	--	--
AS-05	X020	**Hot Mill Cooling Tower**	-0.28	-0.13	-6.66E-04	--	--	--	--	--	--	--
AS-26	**X020**	**Cold Mill Cooling Tower**	**0.26**	**0.12**	**6.15E-04**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-27	**X020**	**Finishing Cooling Tower**	**0.021**	**9.99E-03**	**5.02E-05**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-28	**X020**	**Round Tops/Pushers Cooling Tower**	**0.031**	**0.014**	**7.17E-05**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-06	X021	Emergency Generator Engine #1 (Security Office)	-6.49E-03	-6.49E-03	-6.49E-03	0.017	-0.015	-6.30E-03	-2.54E-05	-5.06	-2.16E-08	0.061
AS-07	X021	Emergency Generator Engine #2 (Admin. Building)	-6.49E-03	-6.49E-03	-6.49E-03	0.017	-0.015	-6.30E-03	-2.54E-05	-5.06	-2.16E-08	0.061
~~AS-08~~	~~X021~~	~~Emergency Generator Engine #3 (Remelt- Cold End)~~	-0.012	-0.012	-0.012	-8.38E-03	-0.065	-0.010	-3.78E-04	-75.26	-3.21E-07	-5.66E-03
~~AS-09~~	~~X021~~	~~Emergency Generator Engine #4 (Remelt- Hot End)~~	-0.012	-0.012	-0.012	-8.38E-03	-0.065	-0.010	-3.78E-04	-75.26	-3.21E-07	-5.66E-03
AS-10	X021	Emergency Generator Engine #5 (Hot Reversing Mill)	-9.01E-03	-9.01E-03	-9.01E-03	0.17	0.29	0.079	-1.74E-04	-34.60	-1.48E-07	0.033
AS-11	X021	Emergency Generator Engine #6 (Hot Finishing Mill)	-7.57E-03	-7.57E-03	-7.57E-03	0.28	0.51	0.13	-8.91E-05	-17.74	-7.58E-08	0.049
AS-12	X021	Emergency Generator Engine #7 (Cold Mill)	-7.57E-03	-7.57E-03	-7.57E-03	0.28	0.51	0.13	-8.91E-05	-17.74	-7.58E-08	0.049

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
~~AS-13~~	~~X021~~	~~Emergency Generator Engine #8 (Coating Line)~~	-0.012	-0.012	-0.012	-8.38E-03	-0.065	-0.010	-3.78E-04	-75.26	-3.21E-07	-5.66E-03
~~AS-14~~	~~X021~~	~~Emergency Generator Engine #9 (Edge Trimmer)~~	-0.012	-0.012	-0.012	-8.38E-03	-0.065	-0.010	-3.78E-04	-75.26	-3.21E-07	-5.66E-03
AS-29	**X021**	**Emergency Generator Engine #10 (Maintenance Bldg)**	**5.99E-03**	**5.99E-03**	**5.99E-03**	**0.025**	**0.050**	**3.75E-03**	**3.53E-04**	**70.20**	**3.00E-07**	**0.067**
AS-30	**X021**	**Emergency Generator Engine #11 (Decoater #1)**	**2.06E-03**	**2.06E-03**	**2.06E-03**	**0.060**	**2.57**	**0.021**	**6.23E-05**	**12.41**	**5.30E-08**	**0.012**
AS-31	**X021**	**Emergency Generator Engine #12 (Decoater #2)**	**2.06E-03**	**2.06E-03**	**2.06E-03**	**0.060**	**2.57**	**0.021**	**6.23E-05**	**12.41**	**5.30E-08**	**0.012**
AS-32	**X021**	**Emergency Generator Engine #13 (Decoater #3)**	**2.06E-03**	**2.06E-03**	**2.06E-03**	**0.060**	**2.57**	**0.021**	**6.23E-05**	**12.41**	**5.30E-08**	**0.012**
AS-15	X021	Fire Pump Engine #1 (North Pump House)	6.28E-03	6.28E-03	6.28E-03	-0.52	-0.020	0.010	-5.25E-05	-5.70	-3.12E-07	-2.38E-05
~~AS-16~~	~~X021~~	~~Fire Pump Engine #2 (South Pump House)~~	-0.023	-0.023	-0.023	-0.56	-0.15	-0.019	-1.05E-03	-113.3	-6.23E-06	-2.71E-03
AS-17	X021	Fire Pump Engine #3 (West Pump House)	-6.13E-03	-6.13E-03	-6.13E-03	-0.83	-0.079	3.03E-03	-3.15E-04	-34.02	-1.87E-06	-7.15E-04
AS-18	X021	Fire Pump Engine #4 (West Pump House)	-4.64E-03	-4.64E-03	-4.64E-03	0.17	-0.054	4.71E-04	6.82E-04	73.62	4.05E-06	1.86E-03
AS-19a to AS-19h	TBD	Building Heating Systems	--	--	--	--	--	--	--	-0.16	--	--
AS-20	Insign.	Hot Baghouses Lime Silos (5)	-4.44E-05	-4.44E-05	-4.44E-05	--	--	--	--	--	--	--
AS-33	**Insign.**	**Cold Baghouse Dry Sorbent Silos (2)**	**3.85E-05**	**3.85E-05**	**3.85E-05**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-21	Insign.	**Diesel Fuel Storage and Refueling Stations (4)**	--	--	--	--	--	2.36E-03	--	--	--	--
AS-22	Insign.	**Hot Rolling Area Storage Tanks (14)**	--	--	--	--	--	3.13	--	--	--	--
AS-23	Insign.	**Cold Rolling Area Storage Tanks (13)**	--	--	--	--	--	-9.74E-03	--	--	--	--
AS-24	Insign.	**Coil Finishing Area Storage Tanks (22)**	--	--	--	--	--	0.24	--	--	--	0.20
AS-25	X022	Paved Haul Roads	0.90	0.18	0.044	--	--	--	--	--	--	--
AS-34	**Insign.**	**Anodizing Test Unit**	**5.34E-04**	**5.34E-04**	**5.34E-04**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-35	**Insign.**	**Filtering Aid Material Handling**	**1.26E-03**	**5.95E-04**	**9.00E-05**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-36	**Insign.**	**Cold Mill Coil Marking Machine**	**--**	**--**	**--**	**--**	**--**	**2.73**	**--**	**--**	**--**	**--**
AS-37	**Insign.**	**Mill Roll Grinding Machines (3)**	**--**	**--**	**--**	**--**	**--**	**4.25**	**--**	**--**	**--**	**--**
AS-38	**Insign.**	**Coil Finishing Roll Grinding Machine**	**0.67**	**0.67**	**0.67**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
AS-39	**Insign.**	**Bearings Washing Machine**	**--**	**--**	**--**	**--**	**--**	**1.79**	**--**	**--**	**--**	**--**
AS-40	**Insign.**	**Hot Mill Parts Washing Bay**	**--**	**--**	**--**	**--**	**--**	**1.80**	**--**	**--**	**--**	**--**
AS-41	**Insign.**	**Roll Shop Parts Washers (4)**	**--**	**--**	**--**	**--**	**--**	**0.53**	**--**	**--**	**--**	**--**
AS-42	**Insign.**	**Maintenance Parts Washers (7)**	**--**	**--**	**--**	**--**	**--**	**3.04**	**--**	**--**	**--**	**--**
AS-43a	**Insign.**	**WWTP- Hot Mill Oil Tanks (2)**	**--**	**--**	**--**	**--**	**--**	**7.40E-03**	**--**	**--**	**--**	**--**

Air Permit Source ID	Air Const. Permit No.	Emission Unit Description	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	GHG (tpy)	Lead (tpy)	Total HAP (tpy)
AS-43b	Insign.	WWTP- Cold Mill Oil Tank	--	--	--	--	--	0.016	--	--	--	--
AS-43c	Insign.	WWTP- Hot Mill DAF	--	--	--	--	--	0.016	--	--	--	--
AS-43d	Insign.	WWTP- Cold Mill DAF	--	--	--	--	--	1.61E-03	--	--	--	--
Project Emissions Increase by Process Area												
		01. Scrap Processing	-4.21	-2.15	-0.63	--	--	--	--	--	--	-0.066
		02. Melting and Casting	4.65	3.74	2.95	5.87	-14.10	6.81	0.017	-3,227	-8.40E-04	5.31
		03. Hot Rolling	-4.48	-3.12	-2.90	-3.06E-03	-1.49E-03	-4.83	-1.34E-05	-3.05	-1.12E-08	-0.067
		04. Cold Rolling	3.17	2.96	2.61	--	--	33.04	--	--	--	--
		05. Coil Finishing	-2.77	-2.76	-1.83	-14.48	-28.97	-3.71	-0.13	-25,181	-1.08E-04	-6.20
		06. Auxiliary Systems	0.96	-0.30	-0.48	-16.58	-18.00	16.16	-0.19	-37,281	-1.63E-04	-0.059

2. Scrap Processing & Sorting Lines

> **Three (3) new aluminum scrap processing lines (#1-#3) will be used to perform some combination of de-baling, shredding, cleaning, and sorting purchased aluminum scrap in preparation for further processing in the new decoater. A scrap sorting section is located on the back end of Scrap Processing Lines #1. The scrap mix expected to be processed by the new scrap processing lines will consist of open market scrap, post industrial automotive scrap, runaround scrap, used beverage cans (UBC) and Class 1 & 3 post-industrial can stock scrap. Each scrap processing line will contain equipment classified as a new aluminum scrap shredder under the National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production defined under 40 CFR 63, Subpart RRR (i.e., herein referred to as SMACT). The scrap sorting lines are not considered aluminum scrap shredders under SMACT.**

Emission Unit IDs:	**SP-01-1**
Emission Unit Descriptions:	**Scrap Processing Line #1 (Flex Line)**
Emission Unit IDs:	**SP-02-1**
Emission Unit Descriptions:	**Scrap Processing Line #2 (CBS Line - UBC)**
Emission Unit IDs:	**SP-03-1**
Emission Unit Descriptions:	**Scrap Processing Line #3 (CBS Line - Class 1 & 3)**
Emission Unit IDs:	**SP-05-1**
Emission Unit Descriptions:	**Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line)**

2.1 Scrap Processing/Sorting Line Process Rates: Metal Throughput

2.1.1 Scrap Processing Line #1 (Flex Line) Metal Processing Capacity

Maximum Hourly Aluminum Throughput:	**33.1**	ton/hr
Maximum Annual Throughput:	**289,684**	tpy

2.1.2 Scrap Processing Line #2 (CBS Line - UBC) Metal Processing Capacity

Maximum Hourly Aluminum Throughput:	**33.1**	ton/hr
Maximum Annual Throughput:	**289,684**	tpy

2.1.3 Scrap Processing Line #3 (CBS Line - Class 1 & 3) Metal Processing Capacity

Maximum Hourly Aluminum Throughput:	**33.1**	ton/hr
Maximum Annual Throughput:	**289,684**	tpy

2.1.4 Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line) Metal Processing Capacity

Maximum Hourly Aluminum Throughput:	**33.1**	ton/hr
Maximum Annual Throughput:	**289,684**	tpy

2.2 Baghouse Stack PM Emission Factor for Aluminum Scrap Processing Lines

> **Emissions from the three (3) scrap processing lines will be collected and routed to their respective individual baghouses for PM emissions control. One additional baghouse (Cold Baghouse #4) will serve the clean shred handling, sorting, and storage sections of the back end of Scrap Processing Line #1 (Flex Line) (i.e., Scrap Sorting Line #1), and this Scrap Sorting Line baghouse will also serve the feed hoppers supplying shreds to the two Decoaters on the CBS Line. Cold Baghouse #3 serving the Scrap Processing Line #3 (CBS Line - Class 1 & 3) will also serve the feed hopper supplying shreds to the Decoater on the Flex Line.**

> **Potential emissions for PM are estimated using an emission factor derived from the baghouse's emissions performance (as exit grain loading) design basis. Emission factors are presented as the expected exit grain loading associated with the four (4) baghouses controlling the source at the "cold end" of the proposed project converted to a lb/SCC unit basis (i.e., lb/ton Al) using the flow capacity of the baghouse and the rated aluminum throughput capacity of the associated scrap processing line equipment.**

> Filterable particulate emissions are speciated into filterable PM10 and filterable PM2.5 size fractions based on EPA's *PM Calculator* database for the relevant Source Classification Code (SCC) associated with secondary aluminum scrap shredding operations.

Parameter	Value		Basis
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of Cold Baghouses #1-#6
Filt. PM10 to Filt. PM Ratio Filt. PM2.5 to Filt. PM Ratio	0.51 0.15	-- --	EPA's PM Calculator for appropriate SCC
Controlled Filt. PM10 Emission Factor (Grain Loading Basis)	0.0010	gr/dscf	0.002 gr filt. PM/dscf x 0.51 lb filt. PM10/lb filt. PM = 0.0010 gr PM10/dscf
Controlled Filt. PM2.5 Emission Factor (Grain Loading Basis)	3.00E-04	gr/dscf	0.002 gr filt. PM/dscf x 0.15 lb filt. PM2.5/lb filt. PM = 3.00E-04 gr PM2.5/dscf
Cold Baghouse #1 Flow Capacity for Scrap Processing Line #1 (Flex Line)	**330,000**	dscfm	Based on vendor design data
Maximum Hourly Aluminum Process Rate for Scrap Processing Line #1 (Flex Line)	33.1	ton/hr	Design aluminum processing capacity
Cold Baghouse #2 Flow Capacity for Scrap Processing Line #2 (CBS Line - UBC)	310,040	dscfm	Based on vendor design data
Maximum Hourly Aluminum Process Rate for Scrap Processing Line #2 (CBS Line - UBC)	33.1	ton/hr	Design aluminum processing capacity
Cold Baghouse #3 Flow Capacity for Scrap Processing Line #3 (CBS Line - Class 1 & 3)	**120,800**	dscfm	Based on vendor design data
Maximum Hourly Aluminum Process Rate for Scrap Processing Line #3 (CBS Line - Class 1 & 3)	33.1	ton/hr	Design aluminum processing capacity
Cold Baghouse #4 Flow Capacity for Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line)	**110,000**	dscfm	Based on vendor design data

Parameter	Value	Basis
Maximum Hourly Aluminum Process Rate for Scrap Sorting Line #1	33.1 ton/hr	Design aluminum processing capacity
Nominal PM/PM10/PM2.5 Control Efficiency of each Cold Baghouse	90%	PM collection efficiency reflective of control efficiency typically achieved by a high air flow rate and moderate inlet loading dust collectors serving aluminum scrap processing systems.

2.2.1 PM/PM10/PM2.5 Baghouse Stack Emission Factors for Scrap Processing Line #1 (Flex Line)

Parameter	Value		Basis
Filt. PM Emission Factor (Production Basis)	**0.17**	lb/ton	0.002 gr filt. PM/dscf x 330,000 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 33.1 ton Al/hr) = 0.17 lb PM/ton Al
Filt. PM10 Emission Factor (Production Basis)	**0.087**	lb/ton	0.17 lb PM/ton x 0.51 lb filt. PM10/lb filt. PM = 0.087 lb PM10/ton
Filt. PM2.5 Emission Factor (Production Basis)	**0.026**	lb/ton	0.17 lb PM/ton x 0.15 lb filt. PM2.5/lb filt. PM = 0.026 lb PM2.5/ton

2.2.2 PM/PM10/PM2.5 Baghouse Stack Emission Factors for Scrap Processing Line #2 (CBS Line - UBC)

Parameter	Value		Basis
Filt. PM Emission Factor (Production Basis)	**0.16**	lb/ton	0.002 gr filt. PM/dscf x 310,040 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 33.1 ton Al/hr) = 0.16 lb PM/ton Al
Filt. PM10 Emission Factor (Production Basis)	**0.082**	lb/ton	0.16 lb PM/ton x 0.51 lb filt. PM10/lb filt. PM = 0.082 lb PM10/ton
Filt. PM2.5 Emission Factor (Production Basis)	**0.024**	lb/ton	0.16 lb PM/ton x 0.15 lb filt. PM2.5/lb filt. PM = 0.024 lb PM2.5/ton

2.2.3 PM/PM10/PM2.5 Baghouse Stack Emission Factors for Scrap Processing Line #3 (CBS Line - Class 1 & 3)

Parameter	Value		Basis
Filt. PM Emission Factor (Production Basis)	**0.063**	lb/ton	0.002 gr filt. PM/dscf x 120,800 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 33.1 ton Al/hr) = 0.063 lb PM/ton Al
Filt. PM10 Emission Factor (Production Basis)	**0.032**	lb/ton	0.063 lb PM/ton x 0.51 lb filt. PM10/lb filt. PM = 0.032 lb PM10/ton
Filt. PM2.5 Emission Factor (Production Basis)	**0.0094**	lb/ton	0.063 lb PM/ton x 0.15 lb filt. PM2.5/lb filt. PM = 0.0094 lb PM2.5/ton

2.2.4 PM/PM10/PM2.5 Baghouse Stack Emission Factors for Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line)

Parameter	Value		Basis
Filt. PM Emission Factor (Production Basis)	0.057	lb/ton	0.002 gr filt. PM/dscf x 110,000 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 33.1 ton Al/hr = 0.057 lb PM/ton Al
Filt. PM10 Emission Factor (Production Basis)	0.029	lb/ton	0.057 lb PM/ton x 0.51 lb filt. PM10/lb filt. PM = 0.029 lb PM10/ton
Filt. PM2.5 Emission Factor (Production Basis)	0.0086	lb/ton	0.057 lb PM/ton x 0.15 lb filt. PM2.5/lb filt. PM = 0.0086 lb PM2.5/ton

2.3 HAP Emissions Estimate for Aluminum Scrap Processing Lines

> Novelis expects that a portion of the PM loading consists of aluminum fines which contain alloying elements that are HAPs. Novelis has reviewed a list of the assumed alloys being processed against reference alloy composition to derive the following emission factors.

Parameter	Value	Basis
Overall PM Loading Expected to be Aluminum Fines	80%	Depending on the scrap type, this can range from 15% to 80%. The cleaner the scrap, the higher percentage of aluminum. Potential emissions rely on the high end of the range.
Manganese (Mn) Composition Expected in Aluminum Fines	1.40%	Based on assumed alloys being processed and the composition from "International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys" from the Aluminum Association in January 2015 (a.k.a, "Teal Sheet").
Chromium (Cr) Composition Expected in Aluminum Fines	0.35%	Based on assumed alloys being processed and the composition from Teal Sheet
Nickel (Ni) Composition Expected in Aluminum Fines	0.20%	Based on assumed alloys being processed and the composition from Teal Sheet

2.3.1 HAP Baghouse Stack Emission Factors for Scrap Processing Line #1 (Flex Line)

Parameter	Value		Basis
Stack Emissions			
Uncontrolled Mn Emission Factor (Production Basis)	1.92E-03	lb/ton	0.17 lb filt. PM/ton x 80% Al fines in filt. PM x 1.40% Mn in Al fines = 0.002 lb Mn/ton Al
Uncontrolled Cr Emission Factor (Production Basis)	4.79E-04	lb/ton	0.17 lb filt. PM/ton x 80% Al fines in filt. PM x 0.35% Cr in Al fines = 4.79E-04 lb Cr/ton Al
Uncontrolled Ni Emission Factor (Production Basis)	2.74E-04	lb/ton	0.17 lb filt. PM/ton x 80% Al fines in filt. PM x 0.20% Ni in Al Fines = 2.74E-04 lb Ni/ton Al

2.3.2 HAP Baghouse Stack Emission Factors for Scrap Processing Line #2 (CBS Line - UBC)

Parameter	Value		Basis
Stack Emissions			
Controlled Mn Emission Factor (Production Basis)	1.80E-03	lb/ton	0.16 lb filt. PM/ton x 80% Al fines in filt. PM x 1.40% Mn in Al fines = 1.80E-03 lb Mn/ton Al
Controlled Cr Emission Factor (Production Basis)	4.50E-04	lb/ton	0.16 lb filt. PM/ton x 80% Al fines in filt. PM x 0.35% Cr in Al fines = 4.50E-04 lb Cr/ton Al
Controlled Ni Emission Factor (Production Basis)	2.57E-04	lb/ton	0.16 lb filt. PM/ton x 80% Al fines in filt. PM x 0.20% Ni in Al Fines = 2.57E-04 lb Ni/ton Al

2.3.3 HAP Baghouse Stack Emission Factors for Scrap Processing Line #3 (CBS Line - Class 1 & 3)

Parameter	Value		Basis
Stack Emissions			
Controlled Mn Emission Factor (Production Basis)	7.01E-04	lb/ton	0.063 lb filt. PM/ton x 80% Al fines in filt. PM x 1.40% Mn in Al fines = 7.01E-04 lb Mn/ton Al
Controlled Cr Emission Factor (Production Basis)	1.75E-04	lb/ton	0.063 lb filt. PM/ton x 80% Al fines in filt. PM x 0.35% Cr in Al fines = 1.75E-04 lb Cr/ton Al
Controlled Ni Emission Factor (Production Basis)	1.00E-04	lb/ton	0.063 lb filt. PM/ton x 80% Al fines in filt. PM x 0.20% Ni in Al Fines = 1.00E-04 lb Ni/ton Al

2.3.4 HAP Baghouse Stack Emission Factors for Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line)

Parameter	Value		Basis
Stack Emissions			
Controlled Mn Emission Factor (Production Basis)	6.39E-04	lb/ton	0.057 lb filt. PM/ton x 80% Al fines in filt. PM x 1.40% Mn in Al fines = 6.39E-04 lb Mn/ton Al
Controlled Cr Emission Factor (Production Basis)	1.60E-04	lb/ton	0.057 lb filt. PM/ton x 80% Al fines in filt. PM x 0.35% Cr in Al fines = 1.60E-04 lb Cr/ton Al
Controlled Ni Emission Factor (Production Basis)	9.12E-05	lb/ton	0.057 lb filt. PM/ton x 80% Al fines in filt. PM x 0.20% Ni in Al Fines = 9.12E-05 lb Ni/ton Al

2.4 Potential Emission Calculations for Scrap Processing Lines

2.4.1 Scrap Processing Line #1 (Flex Line) Baghouse Stack Emissions

> Emission factors shown below are the stack emission factors.

Pollutant	Baghouse Stack Emission Factor (lb/ton)	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.171	Grain Loading Design Basis	33.1	289,684	5.66	24.78
PM10	0.087	EPA PM Calculator	33.1	289,684	2.89	12.64
PM2.5	0.026	EPA PM Calculator	33.1	289,684	0.85	3.72
Mn	1.92E-03	Alloy Composition	33.1	289,684	0.063	0.28
Cr	4.79E-04	Alloy Composition	33.1	289,684	0.016	0.069
Ni	2.74E-04	Alloy Composition	33.1	289,684	9.05E-03	0.040
Total HAPs	2.67E-03	Sum of (Mn, Cr, Ni)	33.1	289,684	0.088	0.39

2.4.2 Scrap Processing Line #2 (CBS Line - UBC) Baghouse Stack Emissions

> Emission factors shown below are the stack emission factors.

Pollutant	Baghouse Stack Emission Factor (lb/ton)	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.161	Grain Loading Design Basis	33.1	289,684	5.31	23.28
PM10	0.082	EPA PM Calculator	33.1	289,684	2.71	11.87
PM2.5	0.024	EPA PM Calculator	33.1	289,684	0.80	3.49
Mn	1.80E-03	Alloy Composition	33.1	289,684	0.060	0.26
Cr	4.50E-04	Alloy Composition	33.1	289,684	0.015	0.065
Ni	2.57E-04	Alloy Composition	33.1	289,684	8.50E-03	0.037
Total HAPs	2.51E-03	Sum of (Mn, Cr, Ni)	33.1	289,684	0.083	0.36

2.4.3 Scrap Processing Line #3 (CBS Line - Class 1 & 3) Baghouse Stack Emissions

> Emission factors shown below are the stack emission factors.

Pollutant	Baghouse Stack Emission Factor (lb/ton)	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.063	Grain Loading Design Basis	33.1	289,684	2.07	9.07
PM10	0.032	EPA PM Calculator	33.1	289,684	1.06	4.63
PM2.5	0.009	EPA PM Calculator	33.1	289,684	0.31	1.36
Mn	7.01E-04	Alloy Composition	33.1	289,684	0.023	0.10
Cr	1.75E-04	Alloy Composition	33.1	289,684	0.006	0.025
Ni	1.00E-04	Alloy Composition	33.1	289,684	3.31E-03	0.015
Total HAPs	9.77E-04	Sum of (Mn, Cr, Ni)	33.1	289,684	0.032	0.14

2.4.4 Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line) Baghouse Stack Emissions

> Emission factors shown below are the stack emission factors.

Pollutant	Baghouse Stack Emission Factor (lb/ton)	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.057	Grain Loading Design Basis	33.1	289,684	1.89	8.26
PM10	0.029	EPA PM Calculator	33.1	289,684	0.96	4.21
PM2.5	0.009	EPA PM Calculator	33.1	289,684	0.28	1.24
Mn	6.39E-04	Alloy Composition	33.1	289,684	0.021	0.09
Cr	1.60E-04	Alloy Composition	33.1	289,684	0.005	0.023
Ni	9.12E-05	Alloy Composition	33.1	289,684	3.02E-03	0.013
Total HAPs	8.90E-04	Sum of (Mn, Cr, Ni)	33.1	289,684	0.029	0.13

3. Rotary Decoaters

> The three (3) new rotary decoaters will be used for thermal decoating of non-clean aluminum scrap. Two (2) decoaters will be installed on the can line, while one (1) decoater will be installed on the can/auto flex line. The three (3) new rotary decoaters will be classified as a new scrap dryer/delacquering kiln/decoating kiln as defined under the SMACT. The decoaters will be used to remove various organic contaminants (such as oil, paint, lacquer, or other coating types) from recycled aluminum scrap prior to melting in one of the new sidewell furnaces or NDC furnaces. Emissions generated by the rotary decoaters will be controlled by an integral hot gas generator or afterburner (used for CO and VOC control) as well as a lime-injected baghouse (used for PM and HCl control).

Emission Unit ID:	**MC-01-1 and MC-01-2**
Emission Unit Description:	**Decoater #3 (Flex Line)**
Emission Unit ID:	**MC-02-1 and MC-02-2**
Emission Unit Description:	**Decoater #2 (CBS Line)**
Emission Unit ID:	**MC-03-1 and MC-03-2**
Emission Unit Description:	**Decoater #1 (CBS Line)**

3.1 Decoater Process Rates: Metal Throughput and Gas Firing Rate

> Each decoater has the operational flexibility to operate in either the primary decoating mode or the secondary drying mode. The maximum hourly aluminum throughput rate associated with the drying mode is higher than the decoating mode because less energy from the Decoater's combustion system is required to simply dry the shredded scrap as opposed to both dry and remove oil/paint/lacquer/other coatings from the surface of the shredded scrap. However, the worst-case emissions profile and all similar facility source testing data for the Decoaters is associated with the decoating mode, so hourly and annual potential emission rates and associated BACT limits are based exclusively on the regulated pollutant emissions profile associated with the decoating mode.

3.1.1 Metal Processing Capacity

Maximum Hourly Aluminum Throughput (Drying Mode):	**73.2**	ton/hr
Maximum Hourly Aluminum Throughput (Decoating Mode):	**27.6**	ton/hr
Maximum Annual Throughput:	**241,406**	tpy

3.1.2 Decoater Natural Gas Firing Rate

> The rotary decoater has two (2) 15.1 MMBtu/hr natural gas burners used for recirculating hot gases.

Maximum Burner Heat Input Capacity:	**30.2**	MMBtu/hr	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Natural Gas Usage:	**0.030**	MMscf/hr	= 30.2 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Natural Gas Usage:	**264.6**	MMscf/yr	

3.2 Documentation of Emission Factors Used for the Decoater

3.2.1 PM Emission Factors Tied to Aluminum Metal Production

> The filterable (filt.) PM emission factor is presented as the expected exit grain loading associated with the baghouse controlling the decoater converted to a lb/SCC unit basis (i.e., lb/ton Al) using the flow capacity of the baghouse and rated aluminum throughput capacity of the decoater. Filt. particulate emissions are speciated into filt. PM10 and filt. PM2.5 size fractions based on EPA's PM Calculator database for the relevant SCC associated with secondary aluminum decoating. The condensable (cond.) PM emission factor is based on a calculated upper prediction limit (UPL) from testing of similar units where the UPL analysis was performed on six (6) tested emission factors at a confidence level of 95%.

Decoater #3 (Flex Line) PM Emission Factors

Parameter	Value		Basis
Stack Emissions			
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Filt. PM10 to Filt. PM Ratio	0.92	--	EPA's PM Calculator for relevant SCC
Controlled Filt. PM10 Emission Factor (Grain Loading Basis)	0.0018	gr/dscf	0.002 gr filt. PM/dscf x 0.92 lb filt. PM10/lb filt. PM = 0.0018 gr PM10/dscf
Filt. PM2.5 to Filt. PM Ratio	0.82	--	EPA's PM Calculator for relevant SCC
Controlled Filt. PM2.5 Emission Factor (Grain Loading Basis)	0.0016	gr/dscf	0.002 gr filt. PM/dscf x 0.82 lb filt. PM2.5/lb filt. PM = 0.0016 gr PM2.5/dscf
Hot Baghouse #1 Baghouse Flow Capacity (Actual Conditions)	148,500	acfm	Hot Baghouse #1 design basis
Nominal Stack Temperature for Hot Baghouse #1	**338**	deg. F	**Nominal stack exit temperature from Hot Baghouse #1 design basis**
Minimum Nominal Moisture Content for Hot Baghouse #1	**0.040**	moist. frac.	**Minimum nominal stack gas moisture content from Hot Baghouse #1 design basis**
Hot Baghouse #1 Baghouse Flow Capacity (Standard Conditions)	**94,305**	dscfm	148,500 acfm x (459.67 + 68 deg. F)/(459.67 + 338 deg. F) x (1 - 0.040 moist. frac.) = 94,305 dscfm
Controlled (Cont.) Filt. PM Emission Factor (Production Basis)	**0.059**	lb/ton	0.002 gr filt. PM/dscf x 94,305 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 27.6 ton Al/hr = 0.059 lb cont. filt. PM/ton
Controlled Filt. PM10 Emission Factor (Production Basis)	**0.054**	lb/ton	0.059 lb cont. filt. PM/ton x 0.92 lb filt. PM10/lb filt. PM = 0.054 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	**0.048**	lb/ton	0.059 lb cont. filt. PM/ton x 0.82 lb filt. PM2.5/lb filt. PM = 0.048 lb cont. filt. PM2.5/ton
Nominal Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	98%	--	PM removal efficiency of lime-injected baghouse for Decoater
Cond. PM Emission Factor	0.14	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on six (6) tested emission factors at a confidence level of 95%.
Controlled Total PM10 Emission Factor (Production Basis)	**0.194**	lb/ton	0.054 lb cont. filt. PM10/ton + 0.14 lb cond. PM/ton = 0.194 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	**0.188**	lb/ton	0.048 lb cont. filt. PM2.5/ton + 0.14 lb cond. PM/ton = 0.188 lb cont. total PM2.5/ton

Decoater #2 (CBS Line) PM Emission Factors

Parameter	Value		Basis
Stack Emissions			
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Filt. PM10 to Filt. PM Ratio	0.92	--	EPA's PM Calculator for relevant SCC
Controlled Filt. PM10 Emission Factor (Grain Loading Basis)	0.0018	gr/dscf	0.002 gr filt. PM/dscf x 0.92 lb filt. PM10/lb filt. PM = 0.0018 gr PM10/dscf
Filt. PM2.5 to Filt. PM Ratio	0.82	--	EPA's PM Calculator for relevant SCC
Controlled Filt. PM2.5 Emission Factor (Grain Loading Basis)	0.0016	gr/dscf	0.002 gr filt. PM/dscf x 0.82 lb filt. PM2.5/lb filt. PM = 0.0016 gr PM2.5/dscf
Hot Baghouse #2 Baghouse Flow Capacity (Actual Conditions)	194,700	acfm	Hot Baghouse #2 design basis
Nominal Stack Temperature for Hot Baghouse #2	**214**	deg. F	Nominal stack exit temperature from Hot Baghouse #2 design basis
Minimum Nominal Moisture Content for Hot Baghouse #2	**0.040**	moist. frac.	**Minimum nominal stack gas moisture content from Hot Baghouse #2 design basis**
Flow Contribution from Decoater #2 to Hot Baghouse #2	**38.4%**	%	56,289 dscfm from Decoater #2 / 161,706 dscfm for Hot Baghouse #2 total flow capacity = 38.4% Flow Cont. from Decoater #2; Ventilation system design evaluation for Hot Baghouse #2 design basis
Hot Baghouse #2 Flow Capacity Contribution from Decoater (Standard Conditions)	**56,289**	dscfm	194,700 acfm x (459.67 + 68 deg. F)/(459.67 + 214 deg. F) x (1 - 0.040 moist. frac.) x 38.4% = 56,289 dscfm
Controlled (Cont.) Filt. PM Emission Factor (Production Basis)	**0.035**	lb/ton	0.002 gr filt. PM/dscf x 56,289 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 27.6 ton Al/hr = 0.035 lb cont. filt. PM/ton
Controlled Filt. PM10 Emission Factor (Production Basis)	**0.032**	lb/ton	0.035 lb cont. filt. PM/ton x 0.92 lb filt. PM10/lb filt. PM = 0.032 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	**0.029**	lb/ton	0.035 lb cont. filt. PM/ton x 0.82 lb filt. PM2.5/lb filt. PM = 0.029 lb cont. filt. PM2.5/ton
Nominal Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	98%	--	PM removal efficiency of lime-injected baghouse for Decoater
Cond. PM Emission Factor	0.14	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on six (6) tested emission factors at a confidence level of 95%.
Controlled Total PM10 Emission Factor (Production Basis)	**0.173**	lb/ton	0.032 lb cont. filt. PM10/ton + 0.14 lb cond. PM/ton = 0.173 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	**0.169**	lb/ton	0.029 lb cont. filt. PM2.5/ton + 0.14 lb cond. PM/ton = 0.169 lb cont. total PM2.5/ton

Decoater #1 (CBS Line) PM Emission Factors

Parameter	Value		Basis
Stack Emissions			
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Filt. PM10 to Filt. PM Ratio	0.92	--	EPA's PM Calculator for relevant SCC
Controlled Filt. PM10 Emission Factor (Grain Loading Basis)	0.0018	gr/dscf	0.002 gr filt. PM/dscf x 0.92 lb filt. PM10/lb filt. PM = 0.0018 gr PM10/dscf
Filt. PM2.5 to Filt. PM Ratio	0.82	--	EPA's PM Calculator for relevant SCC
Controlled Filt. PM2.5 Emission Factor (Grain Loading Basis)	0.0016	gr/dscf	0.002 gr filt. PM/dscf x 0.82 lb filt. PM2.5/lb filt. PM = 0.0016 gr PM2.5/dscf
Hot Baghouse #3 Baghouse Flow Capacity (Actual Conditions)	148,500	acfm	Hot Baghouse #3 design basis
Nominal Stack Temperature for Hot Baghouse #3	304	deg. F	Nominal stack exit temperature from Hot Baghouse #3 design basis
Minimum Nominal Moisture Content for Hot Baghouse #3	0.040	moist. frac.	**Nominal stack gas moisture content from Hot Baghouse #3 design basis**
Hot Baghouse #3 Baghouse Flow Capacity (Standard Conditions)	98,504	dscfm	148,500 acfm x (459.67 + 68 deg. F)/(459.67 + 304 deg. F) x (1 - 0.040 moist. frac.) = 98,504 dscfm
Controlled (Cont.) Filt. PM Emission Factor (Production Basis)	0.061	lb/ton	0.002 gr filt. PM/dscf x 98,504 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 27.6 ton Al/hr = 0.061 lb cont. filt. PM/ton
Controlled Filt. PM10 Emission Factor (Production Basis)	0.056	lb/ton	0.061 lb cont. filt. PM/ton x 0.92 lb filt. PM10/lb filt. PM = 0.056 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	0.050	lb/ton	0.061 lb cont. filt. PM/ton x 0.82 lb filt. PM2.5/lb filt. PM = 0.050 lb cont. filt. PM2.5/ton
Nominal Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	98%	--	PM removal efficiency of lime-injected baghouse for Decoater
Cond. PM Emission Factor	0.14	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on six (6) tested emission factors at a confidence level of 95%.
Controlled Total PM10 Emission Factor (Production Basis)	0.197	lb/ton	0.056 lb cont. filt. PM10/ton + 0.14 lb cond. PM/ton = 0.197 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	0.191	lb/ton	0.050 lb cont. filt. PM2.5/ton + 0.14 lb cond. PM/ton = 0.191 lb cont. total PM2.5/ton

3.2.2 HCl Emission Factor Tied to Aluminum Metal Production

> The HCl emission factor is based on the maximum of 5 tested emission factors of similar units.

Parameter	Value		Basis
Stack Emissions			
Controlled HCl Emission Factor (Production Basis)	0.31	lb/ton	Based on the average of 5 emission factors from testing of similar units.
HCl Control Efficiency of Lime-Injected Baghouse	90%	--	Engineering estimate based on inlet and outlet testing results for lime-injected baghouses serving decoaters at secondary aluminum facilities.

3.2.3 D/F Emission Factor Tied to Aluminum Metal Production

> As no maximum D/F content has been determined at this stage in design, Novelis has decided to conservatively estimate D/F emissions by using the SMACT limit for Decoaters pursuant to 40 CFR 63.1505(e)(1)(iii).

Parameter	Value		Basis
Stack Emissions			
D/F Emission Limit from SMACT for Decoater	7.00E-05	gr/ton	SMACT D/F emission limit for Decoaters pursuant to 40 CFR 63.1505(e)(1)(iii)
D/F Emission Factor	1.00E-08	lb/ton	= 7.00E-05 gr D/F/ton / 7,000 gr/lb

3.2.4 NOX, CO, VOC Emission Factor Tied to Aluminum Metal Production

> The NOX emission factor is based on the Best Available Control Technology (BACT) limit from a comparable facility and includes both the metal processing and natural gas combustion contributions to emissions. Both the CO and VOC post-afterburner emission factors are based on a calculated UPL from 6 tested emission factors at a confidence level of 95% of similar units. Neither of these emission factors include natural gas combustion contributions, so separate emission factors are derived for the natural gas contribution to the overall Decoater emissions profile.

Parameter	Value		Basis
Stack Emissions			
Uncontrolled NOX Emission Factor (Production Basis)	0.32	lb/ton	Based on BACT limit from comparable facility
Post-Afterburner Stack CO Emission Factor (Production Basis)	0.24	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on six (6) tested emission factors at a confidence level of 95%.
Post-Afterburner Stack VOC Emission Factor (Production Basis)	0.16	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on six (6) tested emission factors at a confidence level of 95%.

3.2.5 GHG Emission Factors Tied to Aluminum Metal Production

> The CO2 emission factor is derived based on estimated maximum organic (carbon-containing) contaminants on the feed/charge that enters the Decoater.

Parameter	Value		Basis
Stack Emissions			
Max. Organic (Carbon-Containing) Contaminants on Feed/Charge Entering Decoater	5.0%	lb org. contaminant/ lb Al	Engineering estimate assumed to be as pentane
Organic (Carbon-Containing) Contaminant Loading (Production Basis)	100.00	lb/ton	2,000 lb/ton x 0.05 lb org. contaminant/ lb Al = 100.00 lb/ton
Carbon (C) Molecular Weight Hydrogen (H) Molecular Weight	12.01 1.01	lb/lb-mol lb/lb-mol	Reference value from Periodic Table
Maximum % Carbon in Contaminants [Using Pentane (C5H12) as Surrogate]	83.21%	--	(12.01 lb/lb-mol C x 5 lbmol C) / [(1.01 lb/lb-mol H x 12 lbmol H) + (12.01 lb/lb-mol C x 5 lbmol C)] = 83.21% wt. % C in C5H12; where pentane is the lowest molecular weight, highest carbon content, saturated hydrocarbon that exists as a liquid at feed/charge temperatures.
Contaminant Loading as C (Production Basis)	83.21	lb/ton	100.00 lb/ton org. contaminant loading x 83% % C = 83.21 lb/ton
Oxygen (O) Molecular Weight	16.00	lb/lb-mol	Reference value from Periodic Table
Carbon Dioxide (CO2) Molecular Weight	44.01	lb/lb-mol	12.011 lb/lb-mol C + 2 x 16 lb/lb-mol O = 44.011 lb/lb-mol CO2
CO2 Emission Factor (Production Basis)	304.89	lb/ton	83.21 lb/ton uncont. contaminant VOC as C x 44.01 lb/lb-mol CO2 / 12.011 lb/lb-mol C = 304.89 lb/ton

3.2.6 Metal HAP Emission Factors Tied to Aluminum Metal Production

> The average ("Ave.") metal HAP emission factors are obtained from *Table 5. Summary of Metallic HAP Test Results* from the SMACT Docket Memo To: Rochelle Boyd, Environmental Protection Agency (the EPA) From: Mark Bahner, RTI International entitled "RE: Development of the RTR Risk Modeling Dataset for the Secondary Aluminum Production Source Category", January 30, 2012, Docket ID EPA-HQ-OAR-2010-0544-0139 ("RTR Modeling SMACT Docket Memo") for "Scrap Dryer/ Delacquering/ Decoating Kiln."

Parameter	Value		Basis
Stack Emissions			
Lead Emission Factor (Normalized to PM Emitted)	4.17E-04	lb lead/lb PM	RTR Modeling SMACT Docket Memo Table 5 lead emission factor converted from mg/kg PM to lb/lb PM
Cont. Lead Emission Factor for Decoater #3 (Flex Line) (Production Basis)	**2.45E-05**	lb lead/ton	4.17E-04 lb lead/lb filt. PM x 0.059 lb filt. PM/ton = 2.45E-05 lb lead/ton
Cont. Lead Emission Factor for Decoater #2 (CBS Line) (Production Basis)	**1.46E-05**	lb lead/ton	4.17E-04 lb lead/lb filt. PM x 0.035 lb filt. PM/ton = 1.46E-05 lb lead/ton
Cont. Lead Emission Factor for Decoater #1 (CBS Line) (Production Basis)	**2.56E-05**	lb lead/ton	4.17E-04 lb lead/lb filt. PM x 0.061 lb filt. PM/ton = 2.56E-05 lb lead/ton
Total Metal HAP Emission Factor (Normalized to PM Emitted)	1.42E-03	lb metal HAP/lb PM	RTR Modeling SMACT Docket Memo total metal HAP emission factor converted from mg/kg PM to lb/lb PM
Cont. Total Metal HAP Emission Factor for Decoater #3 (Flex Line) (Production Basis)	**8.34E-05**	lb metal HAP/ton	1.42E-03 lb metal HAP/lb filt. PM x 0.059 lb filt. PM/ton = 8.34E-05 lb metal HAP/ton
Cont. Total Metal HAP Emission Factor for Decoater #2 (CBS Line) (Production Basis)	**4.98E-05**	lb metal HAP/ton	1.42E-03 lb metal HAP/lb filt. PM x 0.035 lb filt. PM/ton = 4.98E-05 lb metal HAP/ton
Cont. Total Metal HAP Emission Factor for Decoater #1 (CBS Line) (Production Basis)	**8.71E-05**	lb metal HAP/ton	1.42E-03 lb metal HAP/lb filt. PM x 0.061 lb filt. PM/ton = 8.71E-05 lb metal HAP/ton

3.2.7 Organic HAP Emission Factors Tied to Aluminum Metal Production

> The average ("Ave.") organic HAP emission factor is obtained from *Table 6. Summary of Organic HAP Test Results, Allowable Emissions* from RTR Modeling SMACT Docket Memo for Scrap Dryer/ Delacquering/ Decoating Kiln. The naphthalene emission factor in Table 6 was flagged as an outlier due to the cumulative organic HAP emission factor using this value exceeding the SMACT allowable THC emission rate. The naphthalene emission factor was replaced with the maximum individual compound emission factor from among the other semi-volatile organic compounds (SVOC) [regulated as HAP from polycyclic organic matter (POM) category].

Parameter	Value		Basis
Stack Emissions			
Post-Afterburner Stack Organic HAP Emission Factor (Production Basis)	0.062	lb/ton	RTR Modeling SMACT Docket Memo Table 6 organic emission factor with adjustment to naphthalene emission factor as an outlier.

3.2.8 CO Emission Factor Tied to Natural Gas Combustion

> The emission factor for CO from natural gas combustion is based on an emission factor for rotary decoater operation provided by a prospective rotary decoater furnace vendor.

Parameter	Value	Basis
Stack Emissions		
Uncontrolled CO Emission Factor (Heat Input Basis)	0.037 lb/MMBtu	Decoater vendor emissions estimate from similar unit.
Uncontrolled CO Emission Factor (Fuel Usage Basis)	37.00 lb/MMscf	0.037 lb uncont. CO/MMBtu x 1,000 Btu/scf = 37.00 lb uncont. CO/hr

3.2.9 GHG Emission Factor Tied to Natural Gas Combustion

> Emission factors for GHGs from natural gas combustion are based on Subpart C of EPA's Mandatory Greenhouse Gas Reporting Rule (MRR, 40 CFR 98 Subpart C Tables C-1 and C-2).

> The global warming potential factors for CH4 and N2O are those specified in Subpart A **(89 FR 31894, Apr. 25, 2024)**.

Global Warming Potentials

GWP for CO2	1	40 CFR 98 Subpart A, Table A-1
GWP for CH4	**28**	40 CFR 98 Subpart A, Table A-1
GWP for N2O	**265**	40 CFR 98 Subpart A, Table A-1

Emission Factors

CO2	53.06	kg/MMBtu	40 CFR 98 Subpart C, Table C-1
	116,977	lb/MMscf	
CH4	1.00E-03	kg/MMBtu	40 CFR 98 Subpart C, Table C-2
	2.20	lb/MMscf	
N2O	1.00E-04	kg/MMBtu	40 CFR 98 Subpart C, Table C-2
	0.22	lb/MMscf	
CO2e	**117,097**	lb/MMscf	= 116,977 lb CO2/MMscf + (2.20 lb CH4/MMscf * 28) + (0.22 lb N2O/MMscf * 265)

3.2.10 HAP/Air Toxics Emission Factor Tied to Natural Gas Combustion

> Emission factors for HAP emissions from natural gas combustion are based on AP-42 Chapter 1.4 Tables 1.4-3 and 1.4-4.

Pollutant	CAS No.	HAP?	EF (lb/MMscf)
Acenaphthene	83-32-9	Y	1.80E-06
Acenaphthylene	206-96-8	Y	1.80E-06
Anthracene	120-12-7	Y	2.40E-06
Arsenic compounds	7440-38-2	Y	2.00E-04
Barium	7440-39-3	N	4.40E-03
Benzene	71-43-2	Y	2.10E-03
Benzo(a)anthracene	56-55-3	Y	1.80E-06
Benzo(a)pyrene	50-32-8	Y	1.20E-06
Benzo(b)fluoranthene	205-99-2	Y	1.80E-06
Benzo(g,h,i)perylene	191-24-2	Y	1.20E-06
Benzo(k)fluoranthene	207-08-9	Y	1.80E-06
Beryllium and compounds	7440-41-7	Y	1.20E-05
Cadmium and compounds	7440-43-9	Y	1.10E-03
Chromium and compounds	7440-47-3	Y	1.40E-03
Chrysene	218-01-9	Y	1.80E-06
Cobalt and compounds	7440-48-4	Y	8.40E-05
Dibenz(a,h)anthracene	53-70-3	Y	1.20E-06
1,4-Dichlorobenzene(p-Dichlorobenzene)	106-46-7	Y	1.20E-03
7,12-Dimethylbenz(a)anthracene	57-97-6	Y	1.60E-05
Fluoranthene	206-44-0	Y	3.00E-06
Fluorene	86-73-7	Y	2.80E-06
Formaldehyde	50-00-0	Y	0.075
Hexane	110-54-3	Y	1.80
Indeno (1,2,3-cd)pyrene	193-39-5	Y	1.80E-06
Lead and compounds	7439-92-1	Y	5.00E-04
Manganese and compounds	7439-96-5	Y	3.80E-04
Mercury and compounds	7439-97-6	Y	2.60E-04
3-Methylcholanthrene	56-49-5	Y	1.80E-06
Methylnaphthalene	91-57-6	Y	2.40E-05
Naphthalene	91-20-3	Y	6.10E-04
Nickel and compounds	7440-02-0	Y	2.10E-03
Pyrene	129-00-0	Y	5.00E-06
Selenium and compounds	7782-49-2	Y	2.40E-05
Toluene	108-88-3	Y	3.40E-03
Vanadium	7440-62-2	N	2.30E-03
Total HAPs			1.89

3.2.11 Additional Emission Factors Tied to Natural Gas Combustion

> PM emissions are accounted for in the baghouse outlet emissions estimate and NOX emissions are included in the emissions estimate for aluminum decoating. All other emission factors are based on reference literature (e.g., EPA's AP-42).

3.3 Potential Emission Calculations for the Decoaters

3.3.1 Potential Emissions Tied to Aluminum Metal Production (Stack) for Decoater #3 (Flex Line)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Decoater (lb/hr)	(tpy)
PM	0.059	lb/ton	Grain Loading Design Basis	27.6	241,406	1.62	7.08
PM10	0.194	lb/ton	EPA PM Calculator + UPL	27.6	241,406	5.36	23.46
PM2.5	0.188	lb/ton	EPA PM Calculator + UPL	27.6	241,406	5.19	22.75
HCl	0.31	lb/ton	Similar Source Test Data	27.6	241,406	8.54	37.42
D/F	1.00E-08	lb/ton	SMACT limit	27.6	241,406	2.76E-07	1.21E-06
NOX	0.32	lb/ton	BACT limit (incl. NG contri.)	27.6	241,406	8.82	38.62
CO	0.24	lb/ton	UPL of Similar Source Test Data	27.6	241,406	6.66	29.16
VOC	0.16	lb/ton	UPL of Similar Source Test Data	27.6	241,406	4.41	19.32
CO2	304.89	lb/ton	Engineering Estimate	27.6	241,406	8,402	36,801
Lead	2.45E-05	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	6.74E-04	2.95E-03
Total Metal HAP	8.34E-05	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	2.30E-03	0.010
Total Organic HAP	0.062	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	1.72	7.51
Total HAPs	0.37	lb/ton	Sum(HCl, D/F, Metal HAP, Org. HAP)	27.6	241,406	10.26	44.94

3.3.2 Potential Emissions Tied to Aluminum Metal Production (Stack) for Decoater #2 (CBS Line)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Decoater (lb/hr)	(tpy)
PM	0.035	lb/ton	Grain Loading Design Basis	27.6	241,406	0.96	4.23
PM10	0.173	lb/ton	EPA PM Calculator + UPL	27.6	241,406	4.76	20.83
PM2.5	0.169	lb/ton	EPA PM Calculator + UPL	27.6	241,406	4.66	20.41
HCl	0.31	lb/ton	Similar Source Test Data	27.6	241,406	8.54	37.42
D/F	1.00E-08	lb/ton	SMACT limit	27.6	241,406	2.76E-07	1.21E-06
NOX	0.32	lb/ton	BACT limit (incl. NG contri.)	27.6	241,406	8.82	38.62
CO	0.24	lb/ton	UPL of Similar Source Test Data	27.6	241,406	6.66	29.16
VOC	0.16	lb/ton	UPL of Similar Source Test Data	27.6	241,406	4.41	19.32
CO2	304.89	lb/ton	Engineering Estimate	27.6	241,406	8,402	36,801
Lead	1.46E-05	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	4.02E-04	1.76E-03
Total Metal HAP	4.98E-05	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	1.37E-03	0.006
Total Organic HAP	0.062	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	1.72	7.51
Total HAPs	0.37	lb/ton	Sum(HCl, D/F, Metal HAP, Org. HAP)	27.6	241,406	10.26	44.94

3.3.3 Potential Emissions Tied to Aluminum Metal Production (Stack) for Decoater #1 (CBS Line)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Decoater (lb/hr)	Potential Emission Rate per Decoater (tpy)
PM	0.061	lb/ton	Grain Loading Design Basis	27.6	241,406	1.69	7.40
PM10	0.197	lb/ton	EPA PM Calculator + UPL	27.6	241,406	5.42	23.75
PM2.5	0.191	lb/ton	EPA PM Calculator + UPL	27.6	241,406	5.25	23.01
HCl	0.31	lb/ton	Similar Source Test Data	27.6	241,406	8.54	37.42
D/F	1.00E-08	lb/ton	SMACT limit	27.6	241,406	2.76E-07	1.21E-06
NOX	0.32	lb/ton	BACT limit (incl. NG contri.)	27.6	241,406	8.82	38.62
CO	0.24	lb/ton	UPL of Similar Source Test Data	27.6	241,406	6.66	29.16
VOC	0.16005	lb/ton	UPL of Similar Source Test Data	27.6	241,406	4.41	19.32
CO2	304.89	lb/ton	Engineering Estimate	27.6	241,406	8,402	36,801
Lead	2.56E-05	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	7.04E-04	3.08E-03
Total Metal HAP	8.71E-05	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	2.40E-03	0.011
Total Organic HAP	0.062	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	1.72	7.51
Total HAPs	0.37	lb/ton	Sum(HCl, D/F, Metal HAP, Org. HAP)	27.6	241,406	10.26	44.94

3.3.4 Potential Emissions Tied to Natural Gas Combustion All Decoaters

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis		Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate per Decoater (lb/hr)	Potential Emission Rate per Decoater (tpy)	Potential Emission Rate for All Decoaters (tpy)
CO	37.0	lb/MMscf	Vendor estimate	0.030	264.6	1.12	4.89	14.68
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	0.030	264.6	0.17	0.73	2.18
SO2	0.6	lb/MMscf	AP-42 Table 1.4-2	0.030	264.6	0.018	0.079	0.24
CO2	116,977	lb/MMscf	40 CFR 98 Subpart C, Table C-1	0.030	264.6	3,533	15,473	46,420
CH4	2.20	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.030	264.6	0.067	0.29	0.87
N2O	0.22	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.030	264.6	6.66E-03	0.029	0.09
CO2e	117,097	lb/MMscf	40 CFR 98 Subpart C	0.030	264.6	3,536	15,489	46,468
Lead	5.00E-04	lb/MMscf	AP-42 Table 1.4-4	0.030	264.6	1.51E-05	6.61E-05	0.00
Total HAPs	1.89	lb/MMscf	AP-42 Tables 1.4-3 & 1.4-4	0.030	264.6	0.057	0.25	0.75

4. Sidewell Melting Furnaces

> A total of five (5) sidewell furnaces will be installed. Three (3) sidewell furnaces will receive decoated aluminum scrap primarily from the two (2) can line decoaters. Two (2) sidewell furnaces will receive decoated aluminum scrap primarily from the one (1) auto/can flex line decoaters. The sidewell furnaces will also support solid reactive fluxing, classifying the five (5) sidewell melt furnaces as Group 1 Furnaces under the SMACT. Charge materials will be both automatically and manually fed to the sidewell of each furnace throughout a given operating period. Hard charge in the form of sows, T-bars, or billets can also be fed to the sidewells through the furnace flue hearth. Emissions generated in each sidewell melt furnace charge well and furnace main hearth will be routed to the respective baghouse serving the applicable furnace groupings as shown in the site-wide emission unit index.

Emission Unit IDs:	**MC-04-1 and MC-04-2**
Emission Unit Descriptions:	**Sidewell Melting Furnace #5 (Flex Line)**
Emission Unit IDs:	**MC-05-1 and MC-05-2**
Emission Unit Descriptions:	**Sidewell Melting Furnace #4 (Flex Line)**
Emission Unit IDs:	**MC-06-1 and MC-06-2**
Emission Unit Descriptions:	**Sidewell Melting Furnace #2 (CBS Line)**
Emission Unit IDs:	**MC-07-1 and MC-07-2**
Emission Unit Descriptions:	**Sidewell Melting Furnace #1 (CBS Line)**
Emission Unit IDs:	**MC-08-1 and MC-08-2**
Emission Unit Descriptions:	**Sidewell Melting Furnace #3 (CBS Line)**

4.1 Sidewell Melting Furnaces Process Rates: Metal Throughput and Gas Firing Rate

4.1.1 Metal Processing Capacity

Sidewell Melting Furnaces #4 and #5 (Flex Line)

Maximum Hourly Aluminum Throughput (per Furnace):	24.3	ton/hr per furnace
Maximum Annual Throughput (per Furnace):	212,437	tpy per furnace

Sidewell Melting Furnaces #1, #2, and #3 (CBS Line)

Maximum Hourly Aluminum Throughput (per Furnace):	24.3	ton/hr per furnace
Maximum Annual Throughput (per Furnace):	212,437	tpy per furnace

4.1.2 Furnace Natural Gas Firing Rate

> The sidewell furnaces each have high-efficiency, low NOx regenerative natural gas burners totaling 38 MMBtu/hr arranged to maximize circulation and residence time of the exhaust gas inside the main hearth of the furnace to transfer necessary energy to heat the molten metal bath.

Sidewell Melting Furnaces #4 and #5 (Flex Line)			
Maximum Burner Heat Input Capacity (per Furnace):	38.0	MMBtu/hr per furnace	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Natural Gas Usage (per Furnace):	0.038	MMscf/hr per furnace	= 38.0 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Natural Gas Usage (per Furnace):	332.9	MMscf/yr per furnace	

Sidewell Melting Furnaces #1, #2, and #3 (CBS Line)			
Maximum Burner Heat Input Capacity (per Furnace):	38.0	MMBtu/hr per furnace	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Natural Gas Usage (per Furnace):	0.038	MMscf/hr per furnace	= 38.0 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Natural Gas Usage (per Furnace):	332.9	MMscf/yr per furnace	

4.2 Documentation of Emission Factors Used for Sidewell Melting Furnaces

4.2.1 PM Emission Factors Tied to Aluminum Metal Production

> The filterable (filt.) PM emission factor is presented as the expected exit grain loading associated with the baghouse controlling the sidewell furnaces converted to a lb/SCC unit basis (i.e., lb/ton Al) using the flow capacity of the baghouse and rated aluminum throughput capacity of the sidewell furnaces. Filt. particulate emissions are speciated into filt. PM10 and filt. PM2.5 size fractions based on "Test Report - Particulate Matter Study at Three Representative Sources at Aluminum Recycling and Rolling Facilities", Prepared for the Aluminum Association by TRC Environmental, Project No. 157428, January 19, 2009 (herein referred to as the TRC Report). The condensable (cond.) PM emission factor is based on a calculated UPL from testing of similar units where the UPL analysis was performed on nine (9) tested emission factors at a confidence level of 95%.

Sidewell Melting Furnaces #4 and #5 (Flex Line) PM Emission Factors

Parameter	Value		Basis
Stack Emissions			
Controlled (Cont.) Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Hot Baghouse #4 Baghouse Flow Capacity (Actual Conditions)	176,000	acfm	Hot Baghouse #4 design basis
Nominal Stack Temperature for Hot Baghouse #4	200	deg. F	Nominal stack exit temperature from Hot Baghouse #4 design basis
Minimum Nominal Moisture Content for Hot Baghouse #4	**0.020**	moist. frac.	**Minimum nominal stack exit moisture from Hot Baghouse #4 design basis**
Flow Contribution from Each Sidewell Melting Furnace to Hot Baghouse #4	50.0%	%	68,983 dscfm from Sidewell Furnace #4/#5 (Flex Line) / 137,967 dscfm for Hot Baghouse #4 total flow capacity = 50.0% Flow Cont. from each sidewell furnace; Ventilation system design evaluation for Hot Baghouse #4 design basis
Each Sidewell Melting Furnace Contribution to Hot Baghouse #4 Flow Capacity (Standard Conditions)	**68,983**	dscfm	176,000 acfm x (459.67 + 68 deg. F)/(459.67 + 200 deg. F) x (1 - 0.020 moist. frac.) x 50.0% = 68,983 dscfm
Controlled Filt. PM Emission Factor (Production Basis)	**0.049**	lb/ton	0.002 gr filt. PM/dscf x 68,983 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 24.3 ton Al/hr = 0.049 lb cont. filt. PM/ton
Filt. PM10 to Filt. PM Ratio	0.71	--	TRC Report test results for "Side-well Furnace with Baghouse"
Filt. PM2.5 to Filt. PM Ratio	0.36	--	TRC Report test results for "Side-well Furnace with Baghouse"
Controlled Filt. PM10 Emission Factor (Production Basis)	**0.035**	lb/ton	0.05 lb cont. filt. PM/ton x 0.71 lb filt. PM10/lb filt. PM = 0.035 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	**0.017**	lb/ton	0.05 lb cont. filt. PM/ton x 0.36 lb filt. PM2.5/lb filt. PM = 0.017 lb cont. filt. PM2.5/ton
Uncontrolled Filt. PM Emission Factor	0.94	lb/ton	Calculated UPL emission factor from inlet testing of a similar source where the main hearth is tied into the baghouse. UPL analysis performed on four (4) available test runs at a confidence level of 95%.
Estimated Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	**94.82%**	--	1 - (0.049 lb cont. filt. PM/ton / 0.94 lb uncont. filt. PM/ton) = 94.82%
Cond. PM Emission Factor	0.13	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on nine (9) tested emission factors at a confidence level of 95%.
Controlled Total PM10 Emission Factor (Production Basis)	**0.160**	lb/ton	0.035 lb conr. filt. PM10/ton + 0.13 lb cond. PM/ton = 0.160 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	**0.143**	lb/ton	0.017 lb cont. filt. PM2.5/ton + 0.13 lb cond. PM/ton = 0.143 lb cont. total PM2.5/ton

Sidewell Melting Furnaces #1 and #2 (CBS Line) PM Emission Factors

Parameter	Value		Basis
Stack Emissions			
Controlled (Cont.) Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Hot Baghouse #5 Baghouse Flow Capacity (Actual Conditions)	176,000	acfm	Hot Baghouse #5 design basis
Nominal Stack Temperature for Hot Baghouse #5	200	deg. F	Nominal stack exit temperature from Hot Baghouse #5 design basis
Minimum Nominal Moisture Content for Hot Baghouse #5	**0.020**	moist. frac.	**Minimum nominal stack exit moisture from Hot Baghouse #5 design basis**
Flow Contribution from Each Sidewell Melting Furnaces to Hot Baghouse #5	50.0%	%	68,983 dscfm from Sidewell Furnace #1/#2 (CBS Line) / 137,967 dscfm for Hot Baghouse #5 total flow capacity = 50.0% Flow Cont. from each sidewell furnace; Ventilation system design evaluation for Hot Baghouse #5 design basis
Each Sidewell Melting Furnace Contribution to Hot Baghouse #5 Flow Capacity (Standard Conditions)	**68,983**	dscfm	176,000 acfm x (459.67 + 68 deg. F)/(459.67 + 200 deg. F) x (1 - 0.020 moist. frac.) x 50.0% = 68,983 dscfm
Controlled Filt. PM Emission Factor (Production Basis)	**0.049**	lb/ton	0.002 gr filt. PM/dscf x 68,983 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 24.3 ton Al/hr = 0.049 lb cont. filt. PM/ton
Controlled Filt. PM10 Emission Factor (Production Basis)	**0.035**	lb/ton	0.049 lb cont. filt. PM/ton x 0.71 lb filt. PM10/lb filt. PM = 0.035 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	**0.017**	lb/ton	0.049 lb cont. filt. PM/ton x 0.36 lb filt. PM2.5/lb filt. PM = 0.017 lb cont. filt. PM2.5/ton
Uncontrolled Filt. PM Emission Factor	0.94	lb/ton	Calculated UPL emission factor from inlet testing of a similar source where the main hearth is tied into the baghouse. UPL analysis performed on four (4) available test runs at a confidence level of 95%.
Estimated Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	**94.82%**	--	1 - (0.049 lb cont. filt. PM/ton / 0.94 lb uncont. filt. PM/ton) = 94.82%
Cond. PM Emission Factor	0.13	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on nine (9) tested emission factors at a confidence level of 95%.
Controlled Total PM10 Emission Factor (Production Basis)	**0.160**	lb/ton	0.035 lb conr. filt. PM10/ton + 0.13 lb cond. PM/ton = 0.160 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	**0.143**	lb/ton	0.017 lb cont. filt. PM2.5/ton + 0.13 lb cond. PM/ton = 0.143 lb cont. total PM2.5/ton

Sidewell Melting Furnace #3 (CBS Line) PM Emission Factors

Parameter	Value		Basis
Stack Emissions			
Controlled (Cont.) Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Hot Baghouse #6 Baghouse Flow Capacity (Actual Conditions)	135,900	acfm	Hot Baghouse #6 design basis
Nominal Stack Temperature for Hot Baghouse #6	192	deg. F	Nominal stack exit temperature from Hot Baghouse #6 design basis
Minimum Nominal Moisture Content for Hot Baghouse #6	0.020	moist. frac.	**Minimum nominal stack exit moisture from Hot Baghouse #6 design basis**
Flow Contribution from Sidewell Melting Furnace #3 to Hot Baghouse #6	59.9%	%	Hot Baghouse #6 design basis
Hot Baghouse #6 Flow Capacity Contribution from Sidewell Melting Furnace #3 (Standard Conditions)	64,543	dscfm	135,900 acfm x (460 + 68 deg. F)/(460 + 192 deg. F) x (1 - 0.020 moist. frac.) x 59.9% = 64,543 dscfm
Controlled Filt. PM Emission Factor (Production Basis)	0.046	lb/ton	0.002 gr filt. PM/dscf x 64,543 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 24.3 ton Al/hr = 0.046 lb cont. filt. PM/ton
Controlled Filt. PM10 Emission Factor (Production Basis)	0.032	lb/ton	0.046 lb cont. filt. PM/ton x 0.71 lb filt. PM10/lb filt. PM = 0.032 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	0.016	lb/ton	0.046 lb cont. filt. PM/ton x 0.36 lb filt. PM2.5/lb filt. PM = 0.016 lb cont. filt. PM2.5/ton
Estimated Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	95.16%	--	1 - (0.046 lb cont. filt. PM/ton / 0.94 lb uncont. filt. PM/ton) = 95.16%
Controlled Total PM10 Emission Factor (Production Basis)	0.158	lb/ton	0.032 lb conr. filt. PM10/ton + 0.13 lb cond. PM/ton = 0.158 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	0.142	lb/ton	0.016 lb cont. filt. PM2.5/ton + 0.13 lb cond. PM/ton = 0.142 lb cont. total PM2.5/ton

4.2.2 HCl Emission Factor Tied to Aluminum Metal Production

> The HCl emission factor is based on the maximum of five (5) stack test-based emission factors of similar units.

Parameter	Value		Basis
Stack Emissions			
Controlled HCl Emission Factor (Production Basis)	0.022	lb/ton	Based on the average of 5 emission factors from testing of similar units.
HCl Control Efficiency of Lime-Injected Baghouse	90%	--	Engineering estimate based on inlet and outlet testing results for lime-injected baghouses serving sidewell furnaces at secondary aluminum facilities.

4.2.3 HF Emission Factor Tied to Aluminum Metal Production

> Novelis will use solid reactive fluxing agents in the five (5) sidewell melt furnaces to purify molten metal throughout a given melt cycle prior to furnace tapping. The salt fluxing agent may contain potassium aluminum fluoride (KAlF4) or sodium aluminum fluoride (Na3AlF6). In order to quantify uncontrolled and uncaptured fluoride emissions from each furnace, Novelis has performed a conservative fluorides mass balance. A fluoride loss percentage was determined from the observed chloride loss rate during testing of similar units. Due to similarities in chemical properties, Novelis has assumed that the fluoride and chloride loss rates are equivalent.

Parameter	Value		Basis
Stack Emissions			
Sodium (Na) Molecular Weight	22.99	lb/lb-mol	Reference value from Periodic Table
Potassium (K) Molecular Weight	39.10	lb/lb-mol	
Aluminum (Al) Molecular Weight	26.98	lb/lb-mol	
Fluoride (F) Molecular Weight	19.00	lb/lb-mol	
Chloride (Cl) Molecular Weight	35.45	lb/lb-mol	
Hydrogen (H) Molecular Weight	1.01	lb/lb-mol	
Wt. % Fluoride in KAlF4 Molecule	53.49%	--	(19.00 lb/lb-mol F x 4 lbmol F) / [(39.10 lb/lb-mol K x 1 lbmol K) + (26.98 lb/lb-mol Al x 1 lbmol Al) + (19.00 lb/lb-mol F x 4 lbmol F)] = 53.49% wt. % F in KAlF4
Wt. % Fluoride in Na3AlF6 Molecule	54.30%	--	(19.00 lb/lb-mol F x 6 lbmol F) / [(22.99 lb/lb-mol Na x 3 lbmol Na) + (26.98 lb/lb-mol Al x 1 lbmol Al) + (19.00 lb/lb-mol F x 6 lbmol F)] = 54.30% wt. % F in Na3AlF6
Wt. % of either KAlF4 or Na3AlF6 in Salt	5.00%	--	SDS for either salt fluxing agent
Max. Wt. % Fluoride in Salt Flux	2.71%	--	54.30% wt. % F in Na3AlF6 x 5.00% wt. % Na3AlF6 in salt flux = 2.71% wt. % F in flux
Max. Salt Flux Injection Rate	40.00	lb/ton	Estimated 2% salt usage per feed/charge rate
Max. Fluoride Injection Rate	1.09	lb/ton	40.00 lb salt flux/ton Al x 2.71% wt. % F in salt flux = 1.09 lb F/ton
Est. Fluoride Loss Percentage to Exhaust	2.00%	--	Assumes F loss percentage is equivalent to observed Cl loss percentage during testing of similar units
Uncontrolled HF Emission Factor (Production Basis)	0.023	lb/ton	1.09 lb F injected/ton x 2.00% F loss percentage x (1.01 lb/lb-mol H + 19.00 lb/lb-mol F) / 19.00 lb/lb-mol F = 0.023 lb uncont. HF/ton
HF Control Efficiency of Lime-Injected Baghouse	90%	--	Engineering estimate based on HCl control efficiency
Controlled HF Emission Factor (Production Basis)	0.0023	lb/ton	0.023 lb uncont. HF/ton x (1-90% HF cont. eff.) = 0.0023 lb cont. HF/ton

4.2.4 D/F Emission Factor Tied to Aluminum Metal Production

> As no maximum D/F content has been determined at this stage in design, Novelis has decided to conservatively estimate D/F emissions by using the SMACT limit for Group 1 furnaces pursuant to 40 CFR 63.1505(i)(3).

Parameter	Value		Basis
Stack Emissions			
D/F Emission Limit from SMACT for Group 1 Furnaces	2.10E-04	gr/ton	SMACT D/F emission limit for Group 1 furnaces pursuant to 40 CFR 63.1505(i)(3)
D/F Emission Factor	3.00E-08	lb/ton	= 2.10E-04 gr D/F/ton / 7,000 gr/lb

4.2.5 NOX, CO, and VOC Emission Factors Tied to Aluminum Metal Production

> The NOX, CO and VOC emission factors are based on a calculated UPL from six (6) tested emission factors at a confidence level of 95% of similar units. None of these emission factors include natural gas combustion contributions so separate emission factors are derived for the NOX, CO, and VOC emissions contribution from natural gas combustion.

Parameter	Value		Basis
Stack Emissions			
Uncontrolled NOX Emission Factor (Production Basis)	0.16	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on six (6) tested emission factors at a confidence level of 95%.
Uncontrolled CO Emission Factor (Production Basis)	0.22	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on five (5) tested emission factors at a confidence level of 95%.
Uncontrolled VOC Emission Factor (Production Basis)	0.22	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on six (6) tested emission factors at a confidence level of 95%.

4.2.6 Metal HAP Emission Factors Tied to Aluminum Metal Production

> The average ("Ave.") metal HAP emission factors are obtained from *Table 5. Summary of Metallic HAP Test Results* from RTR Modeling SMACT Docket Memo for "Group 1 Furnace -- Handling Other than Clean Charge."

Parameter	Value		Basis
Stack Emissions			
Lead Emission Factor (Normalized to PM Emitted)	3.27E-05	lb lead/lb PM	RTR Modeling SMACT Docket Memo Table 5 lead emission factor converted from mg/kg PM to lb/lb PM
Cont. Lead Emission Factor for Sidewell Melting Furnaces #4 and #5 (Flex Line) (Production Basis)	**1.59E-06**	lb lead/ton	3.27E-05 lb lead/lb filt. PM x 0.049 lb filt. PM/ton = 1.59E-06 lb lead/ton
Cont. Lead Emission Factor for Sidewell Melting Furnaces #1 and #2 (CBS Line) (Production Basis)	**1.59E-06**	lb lead/ton	3.27E-05 lb lead/lb filt. PM x 0.049 lb filt. PM/ton = 1.59E-06 lb lead/ton
Cont. Lead Emission Factor for Sidewell Melting Furnace #3 (CBS Line) (Production Basis)	**1.49E-06**	lb lead/ton	3.27E-05 lb lead/lb filt. PM x 0.046 lb filt. PM/ton = 1.49E-06 lb lead/ton
Total Metal HAP Emission Factor (Normalized to PM Emitted)	1.98E-04	lb metal HAP/lb PM	RTR Modeling SMACT Docket Memo total metal HAP emission factor converted from mg/kg PM to lb/lb PM
Cont. Metal HAP Emission Factor for Sidewell Melting Furnaces #4 and #5 (Flex Line) (Production Basis)	**9.65E-06**	lb metal HAP/ton	1.98E-04 lb metal HAP/lb filt. PM x 0.049 lb filt. PM/ton = 9.65E-06 lb metal HAP/ton
Cont. Metal HAP Emission Factor for Sidewell Melting Furnaces #1 and #2 (CBS Line) (Production Basis)	**9.65E-06**	lb metal HAP/ton	1.98E-04 lb metal HAP/lb filt. PM x 0.049 lb filt. PM/ton = 9.65E-06 lb metal HAP/ton
Cont. Metal HAP Emission Factor for Sidewell Melting Furnace #3 (CBS Line) (Production Basis)	**9.03E-06**	lb metal HAP/ton	1.98E-04 lb metal HAP/lb filt. PM x 0.046 lb filt. PM/ton = 9.03E-06 lb metal HAP/ton

4.2.7 NOX Emission Factor Tied to Natural Gas Combustion

> The emission factor for NOX from natural gas combustion is provided by the selected sidewell furnace vendor.

Parameter	Value		Basis
Stack Emissions			
Uncontrolled NOX Emission Factor (Heat Input Basis)	0.123	lb/MMBtu	Vendor emissions estimate
Uncontrolled NOX Emission Factor (Fuel Usage Basis)	123.00	lb/MMscf	0.123 lb uncont. NOX/MMBtu x 1,000 Btu/scf = 123.00 lb uncont. NOX/hr

4.2.8 CO Emission Factor Tied to Natural Gas Combustion

> **The emission factor for CO from natural gas combustion is based on testing data provided by the selected sidewell furnace vendor.**

Parameter	Value		Basis
Maximum Hourly CO Emission Factor			
CO Exhaust Concentration	100	ppmv	Vendor emissions estimate
CO Molecular Weight	28	lb/lbmol	Reference value from Periodic Table
Molar Volume Conversion Factor	386	scf/lbmol	Ideal gas law at 68 deg. F and 1 atm
CO Exhaust Concentration	7.26E-06	lb CO/dscf	= 100 lbmol CO/lbmol gas x 28 lb CO/1 lbmol CO x 1 lbmol gas/386 scf gas
F-Factor	8,710	dscf/MMBtu	EPA Method 19 Table 19-2 F-Factor for Various Fuels dry F-factor for natural gas
O2 Concentration for Emission Factor Correction	3	%	Vendor data from estimate
CO Heat Input Rate-Based Emission Factor	0.074	lb/MMBtu	= 7.26E-06 lb CO/dscf x 8,710 dscf/MMBtu x 20.9% / (20.9% - 3%)
CO Natural Gas Usage Rate-Based Emission Factor	73.88	lb/MMscf	= 0.074 lb CO/MMBtu x 1,000 MMBtu/MMscf

4.2.9 GHG Emission Factor Tied to Natural Gas Combustion

> Emission factors for GHGs from natural gas combustion are based on Subpart C of EPA's Mandatory Greenhouse Gas Reporting Rule (MRR, 40 CFR 98 Subpart C Tables C-1 and C-2). The derivation of the emission factors is presented on the previous emission unit calculation.

4.2.10 HAP/Air Toxics Emission Factor Tied to Natural Gas Combustion

> Emission factors for HAP emissions from natural gas combustion are based on AP-42 Chapter 1.4 Tables 1.4-3 and 1.4-4.. The derivation of the emission factors is presented on a previous emission unit calculation.

4.2.11 Additional Emission Factors Tied to Natural Gas Combustion

> PM emissions are accounted for in the baghouse stack emissions estimate. All other emission factors are based on reference literature (e.g., EPA's AP-42).

4.3 Potential Emission Calculations for Sidewell Melting Furnaces

4.3.1 Sidewell Melting Furnaces #4 and #5 (Flex Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Furnace (lb/hr)	(tpy)	Total Potential Emissions (tpy)
PM	0.049	lb/ton	Grain Loading Design Basis	24.3	212,437	1.18	5.18	10.36
PM10	0.160	lb/ton	TRC Report + UPL	24.3	212,437	3.89	17.05	34.09
PM2.5	0.143	lb/ton	TRC Report + UPL	24.3	212,437	3.47	15.20	30.41
HCl	0.022	lb/ton	Similar Source Test Data	24.3	212,437	0.53	2.34	4.67
HF	2.29E-03	lb/ton	Engineering Estimate	24.3	212,437	0.055	0.24	0.49
D/F	3.00E-08	lb/ton	SMACT Limit	24.3	212,437	7.28E-07	3.19E-06	6.37E-06
NOX	0.16	lb/ton	UPL of Similar Source Test Data	24.3	212,437	3.78	16.57	33.14
CO	0.22	lb/ton	UPL of Similar Source Test Data	24.3	212,437	5.35	23.42	46.84
VOC	0.22	lb/ton	UPL of Similar Source Test Data	24.3	212,437	5.23	22.91	45.82
Lead	1.59E-06	lb/ton	RTR Modeling SMACT Docket	24.3	212,437	3.87E-05	1.69E-04	3.39E-04
Total Metal HAP	9.65E-06	lb/ton	RTR Modeling SMACT Docket	24.3	212,437	2.34E-04	1.02E-03	2.05E-03
Total HAPs	0.02	lb/ton	Sum(HCl, HF, D/F, Metal HAP)	24.3	212,437	0.59	2.58	5.16

4.3.2 Sidewell Melting Furnaces #1 and #2 (CBS Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Furnace (lb/hr)	(tpy)	Total Potential Emissions (tpy)
PM	0.049	lb/ton	Grain Loading Design Basis	24.3	212,437	1.18	5.18	10.36
PM10	0.160	lb/ton	TRC Report + UPL	24.3	212,437	3.89	17.05	34.09
PM2.5	0.143	lb/ton	TRC Report + UPL	24.3	212,437	3.47	15.20	30.41
HCl	0.022	lb/ton	Similar Source Test Data	24.3	212,437	0.53	2.34	4.67
HF	2.29E-03	lb/ton	Engineering Estimate	24.3	212,437	0.055	0.24	0.49
D/F	3.00E-08	lb/ton	SMACT Limit	24.3	212,437	7.28E-07	3.19E-06	6.37E-06
NOX	0.16	lb/ton	UPL of Similar Source Test Data	24.3	212,437	3.78	16.57	33.14
CO	0.22	lb/ton	UPL of Similar Source Test Data	24.3	212,437	5.35	23.42	46.84
VOC	0.22	lb/ton	UPL of Similar Source Test Data	24.3	212,437	5.23	22.91	45.82
Lead	1.59E-06	lb/ton	RTR Modeling SMACT Docket	24.3	212,437	3.87E-05	1.69E-04	3.39E-04
Total Metal HAP	9.65E-06	lb/ton	RTR Modeling SMACT Docket	24.3	212,437	2.34E-04	1.02E-03	2.05E-03
Total HAPs	0.02	lb/ton	Sum(HCl, HF, D/F, Metal HAP)	24.3	212,437	0.59	2.58	5.16

4.3.3 Sidewell Melting Furnace #3 (CBS Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Furnace (lb/hr)	(tpy)
PM	0.046	lb/ton	Grain Loading Design Basis	24.3	212,437	1.11	4.85
PM10	0.158	lb/ton	TRC Report + UPL	24.3	212,437	3.84	16.81
PM2.5	0.142	lb/ton	TRC Report + UPL	24.3	212,437	3.44	15.09
HCl	0.022	lb/ton	Similar Source Test Data	24.3	212,437	0.53	2.34
HF	2.29E-03	lb/ton	Engineering Estimate	24.3	212,437	0.055	0.24
D/F	3.00E-08	lb/ton	SMACT Limit	24.3	212,437	7.28E-07	3.19E-06
NOX	0.16	lb/ton	UPL of Similar Source Test Data	24.3	212,437	3.78	16.57
CO	0.22	lb/ton	UPL of Similar Source Test Data	24.3	212,437	5.35	23.42
VOC	0.2157	lb/ton	UPL of Similar Source Test Data	24.3	212,437	5.23	22.91
Lead	1.49E-06	lb/ton	RTR Modeling SMACT Docket	24.3	212,437	3.62E-05	1.58E-04
Total Metal HAP	9.03E-06	lb/ton	RTR Modeling SMACT Docket	24.3	212,437	2.19E-04	9.59E-04
Total HAPs	0.02	lb/ton	Sum(HCl, HF, D/F, Metal HAP)	24.3	212,437	0.59	2.58

4.3.4 All Sidewell Melting Furnaces #1 to #5 - Potential Emissions Tied to Natural Gas Combustion

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)		Emission Factor Basis	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate per Furnace (lb/hr)	(tpy)	Total Potential Emissions (tpy)
NOX	123.0	lb/MMscf	Vendor estimate	0.038	332.9	4.67	20.47	102.36
CO	73.9	lb/MMscf	Vendor estimate	0.038	332.9	2.81	12.30	61.48
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	0.038	332.9	0.21	0.92	4.58
SO2	0.6	lb/MMscf	AP-42 Table 1.4-2	0.038	332.9	0.023	0.10	0.50
CO2	116,977	lb/MMscf	40 CFR 98 Subpart C, Table C-1	0.038	332.9	4,445	19,470	97,348
CH4	2.20	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.038	332.9	0.084	0.37	1.83
N2O	0.22	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.038	332.9	8.38E-03	0.037	0.18
CO2e	117,097	lb/MMscf	40 CFR 98 Subpart C	0.038	332.9	4,450	19,490	97,448
Lead	5.00E-04	lb/MMscf	AP-42 Table 1.4-4	0.038	332.9	1.90E-05	8.32E-05	4.16E-04
Total HAPs	1.89	lb/MMscf	AP-42 Tables 1.4-3 & 1.4-4	0.038	332.9	0.072	0.31	1.57

5. Novelis Dual Chamber (NDC) Recycle Furnace

> One (1) new NDC Recycle Furnace will be installed for the auto/can flex line. The NDC furnace will either receive decoated aluminum scrap directly from the rotary decoaters via a scrap conveyor that discharges into the open sidewell. Additionally, post-industrial auto and can scrap and/or open market scrap will be charged from a charging machine into the charging chamber. The NDC Furnace can also be fed manually into the open sidewell with runaround scrap or post-industrial auto/can scrap. The open sidewell will also support solid reactive fluxing, classifying the NDC Furnace as a Group 1 Furnace under the SMACT. Emissions generated in the charging chamber, enclosed sidewell, open sidewell, and main hearth will be routed to a shared baghouse serving the NDC Furnace and a Holding Furnace on the auto/can flex line.

Emission Unit IDs:	**MC-09-1 and MC-09-2**
Emission Unit Descriptions:	**Novelis Dual Chamber (NDC) Recycle Furnace #1 (Flex Line)**

5.1 NDC Furnace Process Rates: Metal Throughput and Gas Firing Rate

5.1.1 Metal Processing Capacity

Novelis Dual Chamber (NDC) Recycle Furnace #1 (Flex Line)

Maximum Hourly Aluminum Throughput:	**27.6**	ton/hr
Maximum Annual Throughput:	**241,406**	tpy

5.1.2 Furnace Natural Gas Firing Rate

> The NDC furnace has high-efficiency, low NOx regenerative natural gas burners totaling **48** MMBtu/hr in the main hearth chamber arranged to maximize circulation and residence time of the exhaust gas inside the main hearth of the furnace to transfer necessary energy to heat the molten metal bath. Additionally, the charging chamber has a cold-air burner with a maximum burner heat input rating of **11.3** MMBtu/hr, where the cold air burner is fired in a fuel-rich condition to maintain the chamber free oxygen concentration and to hold the chamber temperature at a target temperature for optimum removal of various organic contaminants (such as oil, paint, lacquer, or other coating types).

Novelis Dual Chamber (NDC) Recycle Furnace #1 (Flex Line)

Maximum Burner Heat Input Capacity:	**59.3**	MMBtu/hr	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Natural Gas Usage:	**0.059**	MMscf/hr	= 59.3 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Natural Gas Usage:	**519.5**	MMscf/yr	

5.2 Documentation of Emission Factors Used for the NDC Furnace

5.2.1 PM Emission Factors Tied to Aluminum Metal Production

> The filterable (filt.) PM emission factor is presented as the expected exit grain loading associated with the baghouse controlling the NDC and Holding Furnaces converted to a lb/SCC unit basis (i.e., lb/ton Al) using the NDC Furnace flow capacity contribution of the baghouse and rated aluminum throughput capacity of the NDC furnace. Filt. particulate emissions are speciated into filt. PM10 and filt. PM2.5 size fractions based on TRC Report. The condensable (cond.) PM emission factor is based on a calculated UPL from testing of similar units where the UPL analysis was performed on nine (9) tested emission factors at a confidence level of 95%.

Parameter	Value		Basis
Stack Emissions			
Controlled (Cont.) Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Hot Baghouse #7 Baghouse Flow Capacity (Actual Conditions)	211,800	acfm	Hot Baghouse #7 design basis
Nominal Stack Temperature for Hot Baghouse #7	191	deg. F	Nominal stack exit temperature from Hot Baghouse #7 design basis
Minimum Nominal Moisture Content for Hot Baghouse #7	**0.020**	moist. frac.	**Minimum nominal stack exit moisture from Hot Baghouse #7 design basis**
Flow Contribution from NDC Recycle Furnace to Hot Baghouse #7	72.6%	%	122,258 dscfm from NDC Furnace #1 / 168,327 dscfm for Hot Baghouse #7 total flow capacity = 72.6% Flow Cont. from NDC Furnace #1; Ventilation system design evaluation for Hot Baghouse #7 design basis
NDC Contribution to Hot Baghouse #7 Flow Capacity (Standard Conditions)	122,258	dscfm	211,800 acfm x (460 + 68 deg. F)/(460 + 191 deg. F) x (1 - 0.020 moist. frac.) x 72.6% = 122,258 dscfm
Controlled Filt. PM Emission Factor (Production Basis)	0.076	lb/ton	0.002 gr filt. PM/dscf x 122,258 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 27.6 ton Al/hr = 0.076 lb cont. filt. PM/ton
Filt. PM10 to Filt. PM Ratio	0.71	--	TRC Report test results for "Side-well Furnace with Baghouse"
Filt. PM2.5 to Filt. PM Ratio	0.36	--	TRC Report test results for "Side-well Furnace with Baghouse"
Controlled Filt. PM10 Emission Factor (Production Basis)	0.054	lb/ton	0.08 lb cont. filt. PM/ton x 0.71 lb filt. PM10/lb filt. PM = 0.054 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	0.027	lb/ton	0.08 lb cont. filt. PM/ton x 0.36 lb filt. PM2.5/lb filt. PM = 0.027 lb cont. filt. PM2.5/ton
Uncontrolled (Uncont.) Filt. PM Emission Factor (Production Basis)	0.94	lb/ton	Calculated UPL emission factor from inlet testing of a similar source where the main hearth is tied into the baghouse. UPL analysis performed on four (4) available test runs at a confidence level of 95%.
Estimated Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	91.93%	--	1 - (0.076 lb cont. filt. PM/ton / 0.94 lb uncont. filt. PM/ton) = 91.93%
Cond. PM Emission Factor	0.13	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on nine (9) tested emission factors at a confidence level of 95%.
Controlled Total PM10 Emission Factor (Production Basis)	0.18	lb/ton	0.054 lb cont. filt. PM10/ton + 0.13 lb cond. PM/ton = 0.18 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	0.15	lb/ton	0.027 lb cont. filt. PM2.5/ton + 0.13 lb cond. PM/ton = 0.15 lb cont. total PM2.5/ton

5.2.2 HCl Emission Factor Tied to Aluminum Metal Production

> The HCl emission factor is based on the maximum of 5 tested emission factors of similar units.

Parameter	Value		Basis
Stack Emissions			
Controlled HCl Emission Factor (Production Basis)	0.022	lb/ton	Based on the average of 5 emission factors from testing of similar units.
HCl Control Efficiency of Lime-Injected Baghouse	90%	--	Engineering estimate based on inlet and outlet testing results for lime-injected baghouses serving sidewell furnaces at secondary aluminum facilities.

5.2.3 HF Emission Factor Tied to Aluminum Metal Production

> Novelis will use solid reactive fluxing agents in the NDC furnace to purify molten metal throughout a given melt cycle prior to furnace tapping. The salt fluxing agent may contain potassium aluminum fluoride (KAlF4) or sodium aluminum fluoride (Na3AlF6). In order to quantify uncontrolled and uncaptured fluoride emissions from the furnace, Novelis has performed a conservative fluorides mass balance. A fluoride loss percentage was determined from the observed chloride loss rate during testing of similar units. Due to similarities in chemical properties, Novelis has assumed that the fluoride and chloride loss rates are equivalent.

Parameter	Value		Basis
Stack Emissions			
Sodium (Na) Molecular Weight	22.99	lb/lb-mol	Reference value from Periodic Table
Potassium (K) Molecular Weight	39.10	lb/lb-mol	
Aluminum (Al) Molecular Weight	26.98	lb/lb-mol	
Fluoride (F) Molecular Weight	19.00	lb/lb-mol	
Chloride (Cl) Molecular Weight	35.45	lb/lb-mol	
Hydrogen (H) Molecular Weight	1.01	lb/lb-mol	
Wt. % Fluoride in KAlF4 Molecule	53.49%	--	(19.00 lb/lb-mol F x 4 lbmol F) / [(39.10 lb/lb-mol K x 1 lbmol K) + (26.98 lb/lb-mol Al x 1 lbmol Al) + (19.00 lb/lb-mol F x 4 lbmol F)] = 53.49% wt. % F in KAlF4
Wt. % Fluoride in Na3AlF6 Molecule	54.30%	--	(19.00 lb/lb-mol F x 6 lbmol F) / [(22.99 lb/lb-mol Na x 3 lbmol Na) + (26.98 lb/lb-mol Al x 1 lbmol Al) + (19.00 lb/lb-mol F x 6 lbmol F)] = 54.30% wt. % F in Na3AlF6
Wt. % of either KAlF4 or Na3AlF6 in Salt	5.00%	--	SDS for either salt fluxing agent
Max. Wt. % Fluoride in Salt Flux	2.71%	--	54.30% wt. % F in Na3AlF6 x 5.00% wt. % Na3AlF6 in salt flux = 2.71% wt. % F in flux
Max. Salt Flux Injection Rate	40.00	lb/ton	Estimated 2% salt usage per feed/charge rate
Max. Fluoride Injection Rate	1.09	lb/ton	40.00 lb salt flux/ton Al x 2.71% wt. % F in salt flux = 1.09 lb F/ton
Est. Fluoride Loss Percentage to Exhaust	2.00%	--	Assumes F loss percentage is equivalent to observed Cl loss percentage during testing of similar units.
Uncontrolled HF Emission Factor (Production Basis)	0.023	lb/ton	1.09 lb F injected/ton x 2.00% F loss percentage x (1.01 lb/lb-mol H + 19.00 lb/lb-mol F) / 19.00 lb/lb-mol F = 0.023 lb uncont. HF/ton
HF Control Efficiency of Lime-Injected Baghouse	90%	--	Engineering estimate based on HCl control efficiency.
Controlled HF Emission Factor (Production Basis)	0.0023	lb/ton	0.023 lb uncont. HF/ton x (1-90% HF cont. eff.) = 0.0023 lb cont. HF/ton

5.2.4 D/F Emission Factor Tied to Aluminum Metal Production

> As no maximum D/F content has been determined at this stage in design, Novelis has decided to conservatively estimate D/F emissions by using the SMACT limit for Group 1 furnaces pursuant to 40 CFR 63.1505(i)(3).

Parameter	Value		Basis
Stack Emissions			
D/F Emission Limit from SMACT for Group 1 Furnaces	2.10E-04	gr/ton	SMACT D/F emission limit for Group 1 furnaces pursuant to 40 CFR 63.1505(i)(3)
D/F Emission Factor	3.00E-08	lb/ton	= 2.10E-04 gr D/F/ton / 7,000 gr/lb

5.2.5 NOX, CO, and VOC Emission Factors Tied to Aluminum Metal Production

> The NOX, CO and VOC emission factors are based on a calculated UPL from six (6) tested emission factors at a confidence level of 95% of similar units. None of these emission factors include natural gas combustion contributions so separate emission factors are derived for the NOX, CO, and VOC emissions contribution from natural gas combustion.

Parameter	Value		Basis
Stack Emissions			
Uncontrolled NOX Emission Factor (Production Basis)	0.16	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on six (6) tested emission factors at a confidence level of 95%.
Uncontrolled CO Emission Factor (Production Basis)	0.22	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on five (5) tested emission factors at a confidence level of 95%.
Uncontrolled VOC Emission Factor (Production Basis)	0.22	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on six (6) tested emission factors at a confidence level of 95%.

5.2.6 GHG Emission Factors Tied to Aluminum Metal Production

> The CO2 emission factor is derived based on estimated maximum organic (carbon-containing) contaminants on the feed/charge that enters the NDC. The derivation of the emission factor is presented on the previous Decoater emission calculations.

5.2.7 Metal HAP Emission Factors Tied to Aluminum Metal Production

> The average ("Ave.") metal HAP emission factors are obtained from *Table 5. Summary of Metallic HAP Test Results* from RTR Modeling SMACT Docket Memo for "Group 1 Furnace -- Handling Other than Clean Charge."

Parameter	Value		Basis
Stack Emissions			
Lead Emission Factor (Normalized to PM Emitted)	3.27E-05	lb lead/lb PM	RTR Modeling SMACT Docket Memo Table 5 lead emission factor converted from mg/kg PM to lb/lb PM
Cont. Lead Emission Factor (Production Basis)	**2.49E-06**	lb lead/ton	3.27E-05 lb lead/lb filt. PM x 0.076 lb filt. PM/ton = 2.49E-06 lb lead/ton
Total Metal HAP Emission Factor (Normalized to PM Emitted)	1.98E-04	lb metal HAP/lb PM	RTR Modeling SMACT Docket Memo total metal HAP emission factor converted from mg/kg PM to lb/lb PM
Cont. Metal HAP Emission Factor (Production Basis)	**1.50E-05**	lb metal HAP/ton	1.98E-04 lb metal HAP/lb filt. PM x 0.076 lb filt. PM/ton = 1.50E-05 lb metal HAP/ton

5.2.8 Organic HAP Emission Factors Tied to Aluminum Metal Production

> Assuming charging chamber of NDC has similar organic HAP emissions profile to Decoater. Refer to Decoater emission calculations for organic HAP emission factor basis.

Parameter	Value		Basis
Stack Emissions			
Organic HAP Emission Factor (Production Basis)	0.062	lb/ton	RTR Modeling SMACT Docket Memo Table 6 organic emission factor with adjustment to naphthalene emission factor as an outlier.

5.2.9 HAP/Air Toxics Emission Factor Tied to Natural Gas Combustion

> Emission factors for HAP emissions from natural gas combustion are based on AP-42 Chapter 1.4 Tables 1.4-3 and 1.4-4.. The derivation of the emission factors is presented on a previous emission unit calculation.

5.2.10 NOX and CO Emission Factors Tied to Natural Gas Combustion

> **The emission factors for NOX and CO from natural gas combustion are based on derived emission factors provided by the selected NDC furnace vendor.**

Parameter	Value		Basis
Stack NOX Emissions			
Uncontrolled NOX Emission Factor (Heat Input Basis)	**0.163**	lb/MMBtu	Engineering estimate based on vendor emissions estimate for low-NOX regenerative and cold air burner NOX emissions performance.
Uncontrolled NOX Emission Factor (Fuel Usage Basis)	**163.48**	lb/MMscf	0.163 lb uncont. NOX/MMBtu x 1,000 Btu/scf = 163.48 lb uncont. NOX/hr

Parameter	Value		Basis
Stack CO Emissions			
Uncontrolled CO Emission Factor (Heat Input Basis)	**0.073**	lb/MMBtu	Engineering estimate based on vendor emissions estimate for regenerative and cold air burner CO emissions performance.
Uncontrolled CO Emission Factor (Fuel Usage Basis)	**73.47**	lb/MMscf	0.073 lb uncont. CO/MMBtu x 1,000 Btu/scf = 73.47 lb uncont. CO/hr

5.2.11 GHG Emission Factor Tied to Natural Gas Combustion

> Emission factors for GHGs from natural gas combustion are based on Subpart C of EPA's Mandatory Greenhouse Gas Reporting Rule (MRR, 40 CFR 98 Subpart C Tables C-1 and C-2). The derivation of the emission factors is presented on a previous emission unit calculation.

5.2.12 Additional Emission Factors Tied to Natural Gas Combustion

> PM emissions are accounted for in the filter house outlet emissions estimate. All other emission factors are based on reference literature (e.g., EPA's AP-42).

5.3 Potential Emission Calculations for the NDC Furnace

5.3.1 Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.076	lb/ton	Grain Loading Design Basis	27.6	241,406	2.10	9.18
PM10	0.18	lb/ton	TRC Report + UPL	27.6	241,406	4.96	21.71
PM2.5	0.15	lb/ton	TRC Report + UPL	27.6	241,406	4.21	18.45
HCl	0.022	lb/ton	Similar Source Test Data	27.6	241,406	0.61	2.66
HF	2.29E-03	lb/ton	Engineering Estimate	27.6	241,406	0.063	0.28
D/F	3.00E-08	lb/ton	SMACT Limit	27.6	241,406	8.27E-07	3.62E-06
NOX	0.16	lb/ton	UPL of Similar Source Test Data	27.6	241,406	4.30	18.83
CO	0.22	lb/ton	UPL of Similar Source Test Data	27.6	241,406	6.08	26.62
VOC	0.22	lb/ton	UPL of Similar Source Test Data	27.6	241,406	5.94	26.03
CO2	304.89	lb/ton	Engineering Estimate	27.6	241,406	8,402	36,801
Lead	2.49E-06	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	6.85E-05	3.00E-04
Total Metal HAP	1.50E-05	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	4.15E-04	1.82E-03
Total Organic HAP	0.062	lb/ton	RTR Modeling SMACT Docket	27.6	241,406	1.72	7.51
Total HAPs	0.087	lb/ton	Sum(HCl, HF, D/F, Metal HAP, Org. HAP)	27.6	241,406	2.39	10.45

5.3.2 Potential Emissions Tied to Natural Gas Combustion

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)		Emission Factor Basis	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
NOX	163.5	lb/MMscf	Vendor estimate	0.059	519.5	9.69	42.46
CO	73.5	lb/MMscf	Vendor estimate	0.059	519.5	4.36	19.08
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	0.059	519.5	0.33	1.43
SO2	0.6	lb/MMscf	AP-42 Table 1.4-2	0.059	519.5	0.036	0.16
CO2	116,977	lb/MMscf	40 CFR 98 Subpart C, Table C-1	0.059	519.5	6,937	30,383
CH4	2.20	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.059	519.5	0.13	0.57
N2O	0.22	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.059	519.5	0.013	0.057
CO2e	117,097	lb/MMscf	40 CFR 98 Subpart C	0.059	519.5	6,944	30,414
Lead	5.00E-04	lb/MMscf	AP-42 Table 1.4-4.	0.059	519.5	2.97E-05	1.30E-04
Total HAPs	1.89	lb/MMscf	AP-42 Tables 1.4-3 & 1.4-4.	0.059	519.5	0.11	0.49

6. Round Top Furnaces

> Two (2) natural gas-fired Round Top Furnaces will be installed (one (1) Round Top furnace for can line and one (1) Round Top furnace for auto/can flex line). The furnaces will predominantly melt clean charge and will not use reactive chlorine/fluorine containing flux. However, Novelis is seeking the operating flexibility to use third-party scrap (similar to internal runaround scrap from the rolling mill) that would be bare aluminum with small amounts of lubricants/oils on the surface. Because third-party scrap that could be charged to the Round Top furnaces is not "entirely free of paints, coatings, and lubricants", these units will be Group 1 Furnaces under SMACT. To load the furnaces, the furnace cover will be removed and overhead charge buckets will transfer scrap and prime material through the opening at the top of the furnace. Emissions generated from the two (2) Flex Line Round Top Furnaces will each be routed to respective hot baghouses shared with Holding Furnaces.

Emission Unit IDs:	**MC-10-1 and MC-10-2**
Emission Unit Descriptions:	**Round Top Furnace #2 (Flex Line)**
Emission Unit IDs:	**MC-11-1 and MC-11-2**
Emission Unit Descriptions:	**Round Top Furnace #1 (CBS Line)**

6.1 Round Top Furnace Process Rates: Metal Throughput and Gas Firing Rate

6.1.1 Metal Processing Capacity

Round Top Furnace #2 (Flex Line)

Maximum Hourly Aluminum Throughput:	46.3	ton/hr
Maximum Annual Throughput:	405,562	tpy

Round Top Furnace #1 (CBS Line)

Maximum Hourly Aluminum Throughput:	46.3	ton/hr
Maximum Annual Throughput:	405,562	tpy

6.1.2 Furnace Natural Gas Firing Rate

> **The Round Top furnaces have a regenerative natural gas-fired combustion system with total maximum burner heat input capacity of 112.0 MMBtu/hr. The regenerative combustion system consists of three (3) burner pairs, where each burner is equipped a regenerator (heat exchanger).**

> One of the regenerators of the burner pair will be heated by the waste gases extracted from the furnace chamber, while the other burner/regenerator configuration of the pair is used simultaneously to heat the furnace. The cold combustion air is heated by the heat storage media before it is mixed with the natural gas fuel and burned. Once the regenerative burner cycle time has elapsed, the flow directions in the "heating mode" and "firing mode" burners are reversed.

Round Top Furnace #2 (Flex Line)

Maximum Burner Heat Input Capacity:	**112.0**	MMBtu/hr	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Natural Gas Usage:	**0.112**	MMscf/hr	= 112.0 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Natural Gas Usage:	**981.1**	MMscf/yr	

Round Top Furnace #1 (CBS Line)

Maximum Burner Heat Input Capacity:	**112.0**	MMBtu/hr	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Natural Gas Usage:	**0.112**	MMscf/hr	= 112.0 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Natural Gas Usage:	**981.1**	MMscf/yr	

6.2 Documentation of Emission Factors Used for the Round Top Furnace

6.2.1 PM Emission Factors Tied to Aluminum Metal Production

> The filterable (filt.) PM emission factor is presented as the expected exit grain loading associated with the baghouse controlling the Round Top and Holding furnaces converted to a lb/SCC unit basis (i.e., lb/ton Al) using the Round Top furnace flow capacity contribution of the baghouse and rated aluminum throughput capacity of the Round Top furnace. Filt. particulate emissions are speciated into filt. PM10 and filt. PM2.5 size fractions based on TRC Report. The condensable (cond.) PM emission factor is based on an average emission factor from nine (9) tested similar units.

Parameter	Value		Basis
Stack Emissions			
Controlled (Cont.) Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Hot Baghouse #8/#9 Baghouse Flow Capacity (Actual Conditions)	**149,100**	acfm	Hot Baghouse #8/#9 design basis
Nominal Stack Temperature for Hot Baghouse #8/#9	**252**	deg. F	Nominal stack exit temperature from Hot Baghouse #8/9 design basis
Minimum Nominal Moisture Content for Hot Baghouse #8/#9	**0.020**	moist. frac.	**Minimum nominal stack exit moisture from Hot Baghouse #8/9 design basis**
Flow Contribution from Each Round Top Furnace to Hot Baghouse #8/#9	**59.7%**	%	64,654 dscfm from each Round Top Furnace / 108,340 dscfm for Hot Baghouse #8/#9 total flow capacity = 59.7% Flow Cont. from each Round Top Furnace; Ventilation system design evaluation for Hot Baghouse #8/#9 design basis
Each Round Top Contribution to Hot Baghouse #8/#9 Flow Capacity (Standard Conditions)	**64,654**	dscfm	149,100 acfm x (460 + 68 deg. F)/(460 + 252 deg. F) x (1 - 0.020 moist. frac.) x 59.7% = 64,654 dscfm
Controlled Filt. PM Emission Factor (Production Basis)	**0.024**	lb/ton	0.002 gr filt. PM/dscf x 64,654 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 46.3 ton Al/hr = 0.024 lb PM/ton Al
Filt. PM10 to Filt. PM Ratio	0.85	--	TRC Report for "Box Type Furnace Stack (5M3)"
Filt. PM2.5 to Filt. PM Ratio	0.79	--	TRC Report for "Box Type Furnace Stack (5M3)"
Controlled Filt. PM10 Emission Factor (Production Basis)	**0.020**	lb/ton	0.024 lb cont. filt. PM/ton x 0.85 lb filt. PM10/lb filt. PM = 0.020 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	**0.019**	lb/ton	0.024 lb cont. filt. PM/ton x 0.79 lb filt. PM2.5/lb filt. PM = 0.019 lb cont. filt. PM2.5/ton
Uncontrolled (Uncont.) Filt. PM Emission Factor (Production Basis)	0.33	lb/ton	Calculated UPL emission factor from testing of a similar source. UPL analysis performed on three (3) available test runs at a confidence level of 95%.
Estimated Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	**92.68%**	--	1 - (0.024 lb cont. filt. PM/ton / 0.33 lb uncont. filt. PM/ton) = 92.68%
Cond. PM Emission Factor	0.057	lb/ton	Based on calculated average emission factor from nine (9) tested emission factors of similar units.
Controlled Total PM10 Emission Factor (Production Basis)	**0.078**	lb/ton	0.020 lb cont. filt. PM10/ton + 0.057 lb cond. PM/ton = 0.078 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	**0.076**	lb/ton	0.019 lb cont. filt. PM2.5/ton + 0.057 lb cond. PM/ton = 0.076 lb cont. total PM2.5/ton

6.2.2 HCl Emission Factor Tied to Aluminum Metal Production

> The uncontrolled HCl emission factor for the Round Top furnaces is conservatively based on test data from a similar Group 1 furnace design that uses salt flux with an estimated HCl control efficiency of the lime-injected baghouse applied.

Parameter	Value	Basis
Stack Emissions		
Uncontrolled HCl Emission Factor (Production Basis)	0.18 lb/ton	Average emission factor from testing of a similar source.
HCl Control Efficiency of Lime-Injected Baghouse	90% --	Engineering estimate based on inlet and outlet testing results for lime-injected baghouses serving sidewell furnaces at secondary aluminum facilities.
Controlled HCl Emission Factor (Production Basis)	0.018 lb/ton	0.18 lb uncont. HCl/ton x (1-90% HCl cont. eff.) = 0.018 lb cont. HCl/ton

6.2.3 D/F Emission Factor Tied to Aluminum Metal Production

> As no maximum D/F content has been determined at this stage in design, Novelis has decided to conservatively estimate D/F emissions by using the SMACT limit for Group 1 furnaces pursuant to 40 CFR 63.1505(i)(3).

Parameter	Value	Basis
Stack Emissions		
D/F Emission Limit from SMACT for Group 1 Furnaces	2.10E-04 gr/ton	SMACT D/F emission limit for Group 1 furnaces pursuant to 40 CFR 63.1505(i)(3)
D/F Emission Factor	3.00E-08 lb/ton	= 2.10E-04 gr D/F/ton / 7,000 gr/lb

6.2.4 NOX, CO, and VOC Emission Factors Tied to Aluminum Metal Production

> The NOX, CO, and VOC emission factor is based on the minimum emission factor from nine (9) tested emission factors of similar Group 1 Furnace units. The minimum was selected due to the relatively low level of surface contamination expected for the Round Top Furnace relative to the Group 1 furnace operations considered in the similar source testing data set. The NOX, CO, and VOC emission factors do not include natural gas combustion contributions.

Parameter	Value	Basis
Stack Emissions		
Uncontrolled NOX Emission Factor (Production Basis)	5.14E-03 lb/ton	Based on minimum emission factor from nine (9) tested emission factors of similar Group 1 Furnace units.
Uncontrolled CO Emission Factor (Production Basis)	0.020 lb/ton	Based on minimum emission factor from nine (9) tested emission factors of similar Group 1 Furnace units.
Uncontrolled VOC Emission Factor (Production Basis)	0.058 lb/ton	Based on minimum emission factor from nine (9) tested emission factors of similar Group 1 Furnace units.

6.2.5 HAP/Air Toxics Emission Factor Tied to Natural Gas Combustion

> Emission factors for HAP emissions from natural gas combustion are based on AP-42 Chapter 1.4 Tables 1.4-3 and 1.4-4.. The derivation of the emission factors is presented on a previous emission unit calculation.

6.2.6 Site Specific Emission Factors Tied to Natural Gas Combustion

> The emission factors for NOX and CO from natural gas combustion are based on the selected burner vendors emissions performance estimates.

Parameter	Value		Basis
Maximum Hourly NOX Emission			
NOX Exhaust Concentration	100	ppmv	Vendor estimate for low-NOX, regenerative burner emissions performance
NO2 Molecular Weight	46	lb/lbmol	Consistent with Method 19, assume all NOX is NO2
Molar Volume Conversion Factor	386	scf/lbmol	Ideal gas law at 68 deg. F and 1 atm
NOX Exhaust Concentration	1.19E-05	lb NOX/dscf	= 100 lbmol NOX/lbmol gas x 46 lb NO2/1 lbmol NO2 x 1 lbmol gas/386 scf gas
F-Factor	8,710	dscf/MMBtu	EPA Method 19 Table 19-2 F-Factor for Various Fuels dry F-factor for natural gas
O2 Concentration for Emission Factor Correction	3	%	Vendor data from guarantee
NOX Heat Input Rate-Based Emission Factor	0.121	lb/MMBtu	= 1.19E-05 lb NO2/dscf x 8,710 dscf/MMBtu x 20.9% / (20.9% - 3%)
NOX Natural Gas Usage Rate-Based Emission Factor	121.33	lb/MMscf	= 0.12 lb NO2/MMBtu x 1,000 MMBtu/MMscf

Parameter	Value		Basis
Maximum Hourly CO Emission Factor			
CO Exhaust Concentration	100	ppmv	Vendor estimate for low-NOX, regenerative burner emissions performance
CO Molecular Weight	28	lb/lbmol	Reference value from Periodic Table
CO Exhaust Concentration	7.26E-06	lb CO/dscf	= 100 lbmol CO/lbmol gas x 28 lb CO/1 lbmol CO x 1 lbmol gas/386 scf gas
O2 Concentration for Emission Factor Correction	3	%	Vendor data from guarantee
CO Heat Input Rate-Based Emission Factor	0.074	lb/MMBtu	= 7.26E-06 lb CO/dscf x 8,710 dscf/MMBtu x 20.9% / (20.9% - 3%)
CO Natural Gas Usage Rate-Based Emission Factor	73.88	lb/MMscf	= 0.074 lb CO/MMBtu x 1,000 MMBtu/MMscf

6.2.7 GHG Emission Factor Tied to Natural Gas Combustion

> Emission factors for GHGs from natural gas combustion are based on Subpart C of EPA's Mandatory Greenhouse Gas Reporting Rule (MRR, 40 CFR 98 Subpart C Tables C-1 and C-2). The derivation of the emission factors is presented on a previous emission unit calculation.

6.2.8 Additional Emission Factors Tied to Natural Gas Combustion

> PM emissions are accounted for in the filter house outlet emissions estimate. All other emission factors are based on reference literature (e.g., EPA's AP-42).

6.3 Potential Emission Calculations for the Round Top Furnace

6.3.1 Round Top Furnace #2 (Flex Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.024	lb/ton	Grain Loading Design Basis	46.3	405,562	1.11	4.85
PM10	0.078	lb/ton	TRC Report + UPL	46.3	405,562	3.60	15.78
PM2.5	0.076	lb/ton	TRC Report + UPL	46.3	405,562	3.53	15.46
HCl	0.018	lb/ton	UPL of Similar Source Test Data	46.3	405,562	0.82	3.59
D/F	3.00E-08	lb/ton	SMACT Limit	46.3	405,562	1.39E-06	6.08E-06
NOX	5.14E-03	lb/ton	Min. of Similar Group 1 Units	46.3	405,562	0.24	1.04
CO	0.020	lb/ton	Min. of Similar Group 1 Units	46.3	405,562	0.91	3.98
VOC	0.058	lb/ton	Min. of Similar Group 1 Units	46.3	405,562	2.68	11.73
Total HAPs	0.018	lb/ton	Sum(HCl, D/F)	46.3	405,562	0.82	3.59

6.3.2 Round Top Furnace #2 (Flex Line) - Potential Emissions Tied to Natural Gas Combustion

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)		Emission Factor Basis	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
NOX	121.3	lb/MMscf	Vendor estimate	0.112	981.1	13.59	59.52
CO	73.9	lb/MMscf	Vendor estimate	0.112	981.1	8.27	36.24
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	0.112	981.1	0.62	2.70
SO2	0.6	lb/MMscf	AP-42 Table 1.4-2	0.112	981.1	0.067	0.29
CO2	116,977	lb/MMscf	40 CFR 98 Subpart C, Table C-1	0.112	981.1	13,101	57,384
CH4	2.20	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.112	981.1	0.25	1.08
N2O	0.22	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.112	981.1	0.025	0.108
CO2e	117,097	lb/MMscf	40 CFR 98 Subpart C	0.112	981.1	13,115	57,443
Lead	5.00E-04	lb/MMscf	AP-42 Tables 1.4-4.	0.112	981.1	5.60E-05	2.45E-04
Total HAPs	1.89	lb/MMscf	AP-42 Tables 1.4-3 & 1.4-4.	0.112	981.1	0.21	0.93

6.3.3 Round Top Furnace #1 (CBS Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.024	lb/ton	Grain Loading Design Basis	46.3	405,562	1.11	4.85
PM10	0.078	lb/ton	TRC Report + UPL	46.3	405,562	3.60	15.78
PM2.5	0.076	lb/ton	TRC Report + UPL	46.3	405,562	3.53	15.46
HCl	0.018	lb/ton	UPL of Similar Source Test Data	46.3	405,562	0.82	3.59
D/F	3.00E-08	lb/ton	SMACT Limit	46.3	405,562	1.39E-06	6.08E-06
NOX	5.14E-03	lb/ton	Min. of Similar Group 1 Units	46.3	405,562	0.238	1.04
CO	0.020	lb/ton	Min. of Similar Group 1 Units	46.3	405,562	0.91	3.98
VOC	0.058	lb/ton	Min. of Similar Group 1 Units	46.3	405,562	2.68	11.73
Total HAPs	0.018	lb/ton	Sum(HCl, D/F)	46.3	405,562	0.82	3.59

6.3.4 Round Top Furnace #1 (CBS Line) - Potential Emissions Tied to Natural Gas Combustion

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis		Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
NOX	121.3	lb/MMscf	Vendor estimate	0.112	981.1	13.59	59.52
CO	73.9	lb/MMscf	Vendor estimate	0.112	981.1	8.27	36.24
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	0.112	981.1	0.62	2.70
SO2	0.6	lb/MMscf	AP-42 Table 1.4-2	0.112	981.1	0.067	0.29
CO2	116,977	lb/MMscf	40 CFR 98 Subpart C, Table C-1	0.112	981.1	13,101	57,384
CH4	2.20	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.112	981.1	0.25	1.08
N2O	0.22	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.112	981.1	0.025	0.108
CO2e	117,097	lb/MMscf	40 CFR 98 Subpart C	0.112	981.1	13,115	57,443
Lead	5.00E-04	lb/MMscf	AP-42 Tables 1.4-4.	0.112	981.1	5.60E-05	2.45E-04
Total HAPs	1.89	lb/MMscf	AP-42 Tables 1.4-3 & 1.4-4.	0.112	981.1	0.21	0.93

7. Holding Furnaces #1-4

> Four (4) new molten aluminum holding furnaces will be installed. Two (2) Holding Furnaces will be installed on the can line and two (2) associated in-line degassers will be included. Two (2) Holding Furnaces will be installed on the auto/can flex Line and **two (2)** associated in-line degassers will be included. Molten aluminum produced by the five (5) new sidewell melt furnaces, one (1) new NDC furnace, and two (2) new round top melting furnaces will be troughed directly to one of the four (4) holding furnaces for further alloying and metal purification activities prior to casting. Once alloying, reactive fluxing, and drossing activities in the holding furnace are completed, molten metal is transported from the holding furnaces through an associated in-line degasser where a limited amount of reactive fluxing using chlorine gas is performed as a final metal conditioning step prior to casting. Once metal flows through the in-line degasser it is cast in one of the **twenty (20)** ingot casting molds in the proposed project's casting bay (**5** ingots **for each** casting pit). Emissions generated by each holding furnace and associated in-line degasser will be collected and ducted to a separate hot baghouse for each holding furnace shared with a Sidewell/NDC/Round Top furnace.

Emission Unit IDs:	**MC-12-1 through MC-13-2**
Emission Unit Descriptions:	**Holding Furnace #4 (Flex Line) and Holding Furnace #3 (Flex Line)**
Emission Unit IDs:	**MC-14-1 through MC-15-2**
Emission Unit Descriptions:	**Holding Furnace #2 (CBS Line) and Holding Furnace #1 (CBS Line)**

7.1 Holding Furnace Process Rates: Metal Throughput and Gas Firing Rate

7.1.1 Metal Processing Capacity

Holding Furnace #4 (Flex Line) and Holding Furnace #3 (Flex Line)

Maximum Hourly Aluminum Throughput (per Furnace):	**61.2**	ton/hr per furnace
Maximum Annual Throughput (per Furnace):	**535,921**	tpy

Holding Furnace #2 (CBS Line) and Holding Furnace #1 (CBS Line)

Maximum Hourly Aluminum Throughput (per Furnace):	**59.5**	ton/hr per furnace
Maximum Annual Throughput (per Furnace):	**521,437**	tpy

7.1.2 Furnace Natural Gas Firing Rate

> The holding furnaces each have low NOx, cold-air natural gas burners totaling 27 MMBtu/hr arranged to allow charging, skimming, fluxing, and casting and to facilitate cleaning from the exterior of the furnace.

Holding Furnace #4 (Flex Line) and Holding Furnace #3 (Flex Line)

Maximum Burner Heat Input Capacity (per Furnace):	**27.0**	MMBtu/hr per furnace	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Natural Gas Usage (per Furnace):	**0.027**	MMscf/hr per furnace	= 27.0 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Natural Gas Usage (per Furnace):	**236.5**	MMscf/yr per furnace	

Holding Furnace #2 (CBS Line) and Holding Furnace #1 (CBS Line)

Maximum Burner Heat Input Capacity (per Furnace):	**27.0**	MMBtu/hr per furnace	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Natural Gas Usage (per Furnace):	**0.027**	MMscf/hr per furnace	= 27.0 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Natural Gas Usage (per Furnace):	**236.5**	MMscf/yr per furnace	

7.2 Documentation of Emission Factors Used for Holding Furnaces

7.2.1 PM Emission Factors Tied to Aluminum Metal Production

> The filterable (filt.) PM emission factor is presented as the expected exit grain loading associated with the shared baghouses controlling the Holding and Sidewell/NDC/Round Top melting furnaces converted to a lb/SCC unit basis (i.e., lb/ton Al) using the holding furnace flow capacity contribution of the baghouse and rated aluminum throughput capacity of the holding furnace. Filt. particulate emissions are speciated into filt. PM10 and filt. PM2.5 size fractions based on TRC Report. The condensable (cond.) PM emission factor is based on an average emission factor from three (3) similar unit test runs.

Holding Furnace #4 (Flex Line) PM Emission Factors

Parameter	Value		Basis
Stack Emissions			
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Hot Baghouse #8 Baghouse Flow Capacity (Actual Conditions)	149,100	acfm	Hot Baghouse #8 design basis.
Nominal Stack Temperature for Hot Baghouse #8	252	deg. F	Nominal stack exit temperature from Hot Baghouse #8 design basis
Minimum Nominal Moisture Content for Hot Baghouse #8	0.020	moist. frac.	**Minimum nominal stack exit moisture from Hot Baghouse #8 design basis**
Flow Contribution from Holding Furnace #4 to Hot Baghouse #8	40.3%	%	43,686 dscfm from Holding Furnace #4 / 108,340 dscfm for Hot Baghouse #8 total flow capacity = 40.3% Flow Cont. from Holding Furnace #4; Ventilation system design evaluation for Hot Baghouse #8 design basis
Holding Furnace #4 Contribution to Hot Baghouse #8 Flow Capacity (Standard Conditions)	43,686	dscfm	149,100 acfm x (460 + 68 deg. F)/(460 + 252 deg. F) x (1 - 0.020 moist. frac.) x 40.3% = 43,686 dscfm
Controlled Filt. PM Emission Factor (Production Basis)	0.012	lb/ton	0.002 gr filt. PM/dscf x 43,686 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 61.2 ton Al/hr = 0.012 lb PM/ton Al
Filt. PM10 to Filt. PM Ratio	0.85	--	TRC Report for "Box Type Furnace Stack (5M3)"
Filt. PM2.5 to Filt. PM Ratio	0.79	--	TRC Report for "Box Type Furnace Stack (5M3)"
Controlled Filt. PM10 Emission Factor (Production Basis)	0.010	lb/ton	0.012 lb cont. filt. PM/ton x 0.85 lb filt. PM10/lb filt. PM = 0.010 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	0.010	lb/ton	0.012 lb cont. filt. PM/ton x 0.79 lb filt. PM2.5/lb filt. PM = 0.010 lb cont. filt. PM2.5/ton
Uncontrolled Filt. PM Emission Factor (Production Basis)	0.079	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on three (3) tested emission factors at a confidence level of 99.9%.
Estimated Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	84.60%	--	1 - (0.012 lb cont. filt. PM/ton / 0.079 lb uncont. filt. PM/ton) = 84.60%
Cond. PM Emission Factor	0.013	lb/ton	Based on calculated UPL emission factor from testing of similar units. UPL analysis performed on three (3) tested emission factors at a confidence level of 99%.
Controlled Total PM10 Emission Factor (Production Basis)	0.024	lb/ton	0.010 lb cont. filt. PM10/ton + 0.013 lb cond. PM/ton = 0.024 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	0.023	lb/ton	0.010 lb cont. filt. PM2.5/ton + 0.013 lb cond. PM/ton = 0.023 lb cont. total PM2.5/ton

Holding Furnace #3 (Flex Line) PM Emission Factors

Parameter	Value		Basis
Stack Emissions			
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Hot Baghouse #7 Baghouse Flow Capacity (Actual Conditions)	**211,800**	acfm	Hot Baghouse #7 design basis
Nominal Stack Temperature for Hot Baghouse #7	**191**	deg. F	Nominal stack exit temperature from Hot Baghouse #7 design basis
Minimum Nominal Moisture Content for Hot Baghouse #7	**0.020**	moist. frac.	Minimum nominal stack exit moisture from Hot Baghouse #7 design basis
Flow Contribution from Holding Furnace #3 to Hot Baghouse #7	**27.4%**	%	46,069 dscfm from Holding Furnace #3 / 168,327 dscfm for Hot Baghouse #7 total flow capacity = 27.4% Flow Cont. from Holding Furnace #3; Ventilation system design evaluation for Hot Baghouse #7 design basis
Holding Furnace #3 Contribution to Hot Baghouse #7 Flow Capacity (Standard Conditions)	**46,069**	dscfm	211,800 acfm x (460 + 68 deg. F)/(460 + 191 deg. F) x (1 - 0.020 moist. frac.) x 27.4% = 46,069 dscfm
Controlled Filt. PM Emission Factor (Production Basis)	**0.013**	lb/ton	0.002 gr filt. PM/dscf x 46,069 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 61.2 ton Al/hr = 0.013 lb PM/ton Al
Controlled Filt. PM10 Emission Factor (Production Basis)	**0.011**	lb/ton	0.013 lb cont. filt. PM/ton x 0.85 lb filt. PM10/lb filt. PM = 0.011 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	**0.010**	lb/ton	0.013 lb cont. filt. PM/ton x 0.79 lb filt. PM2.5/lb filt. PM = 0.010 lb cont. filt. PM2.5/ton
Estimated Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	**83.76%**	--	1 - (0.013 lb cont. filt. PM/ton / 0.079 lb uncont. filt. PM/ton) = 83.76%
Controlled Total PM10 Emission Factor (Production Basis)	**0.024**	lb/ton	0.011 lb cont. filt. PM10/ton + 0.013 lb cond. PM/ton = 0.024 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	**0.024**	lb/ton	0.010 lb cont. filt. PM2.5/ton + 0.013 lb cond. PM/ton = 0.024 lb cont. total PM2.5/ton

Holding Furnace #2 (CBS Line) PM Emission Factors

Parameter	Value		Basis
Stack Emissions			
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Hot Baghouse #6 Baghouse Flow Capacity (Actual Conditions)	**135,900**	acfm	Hot Baghouse #6 design basis.
Minimum Nominal Stack Temperature for Hot Baghouse #6	**192**	deg. F	Nominal stack exit temperature from Hot Baghouse #6 design basis
Minimum Nominal Moisture Content for Hot Baghouse #6	**0.020**	moist. frac.	Minimum nominal stack exit moisture from Hot Baghouse #6 design basis
Flow Contribution from Holding Furnace #2 to Hot Baghouse #6	**40.1%**	%	43,298 dscfm from Holding Furnace #2 / 107,840 dscfm for Hot Baghouse #6 total flow capacity = 40.1% Flow Cont. from Holding Furnace #2; Ventilation system design evaluation for Hot Baghouse #6 design basis
Holding Furnace #2 Contribution to Hot Baghouse #6 Flow Capacity (Standard Conditions)	**43,298**	dscfm	135,900 acfm x (460 + 68 deg. F)/(460 + 192 deg. F) x (1 - 0.020 moist. frac.) x 40.1% = 43,298 dscfm
Controlled Filt. PM Emission Factor (Production Basis)	**0.012**	lb/ton	0.002 gr filt. PM/dscf x 43,298 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 59.5 ton Al/hr = 0.012 lb PM/ton Al
Controlled Filt. PM10 Emission Factor (Production Basis)	**0.011**	lb/ton	0.012 lb cont. filt. PM/ton x 0.85 lb filt. PM10/lb filt. PM = 0.011 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	**0.010**	lb/ton	0.012 lb cont. filt. PM/ton x 0.79 lb filt. PM2.5/lb filt. PM = 0.010 lb cont. filt. PM2.5/ton
Estimated Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	**84.31%**	--	1 - (0.012 lb cont. filt. PM/ton / 0.079 lb uncont. filt. PM/ton) = 84.31%
Controlled Total PM10 Emission Factor (Production Basis)	**0.024**	lb/ton	0.011 lb cont. filt. PM10/ton + 0.013 lb cond. PM/ton = 0.024 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	**0.023**	lb/ton	0.010 lb cont. filt. PM2.5/ton + 0.013 lb cond. PM/ton = 0.023 lb cont. total PM2.5/ton

Holding Furnace #1 (CBS Line) PM Emission Factors

Parameter	Value		Basis
Stack Emissions			
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Hot Baghouse #9 Baghouse Flow Capacity (Actual Conditions)	**149,100**	acfm	Hot Baghouse #9 design basis.
Minimum Nominal Stack Temperature for Hot Baghouse #9	**252**	deg. F	Nominal stack exit temperature from Hot Baghouse #9 design basis
Minimum Nominal Moisture Content for Hot Baghouse #9	**0.020**	moist. frac.	Minimum nominal stack exit moisture from Hot Baghouse #9 design basis
Flow Contribution from Holding Furnace #1 to Hot Baghouse #9	**40.3%**	%	43,686 dscfm from Holding Furnace #1 / 108,340 dscfm for Hot Baghouse #9 total flow capacity = 40.3% Flow Cont. from Holding Furnace #1; Ventilation system design evaluation for Hot Baghouse #9 design basis
Holding Furnace #1 Contribution to Hot Baghouse #9 Flow Capacity (Standard Conditions)	**43,686**	dscfm	149,100 acfm x (460 + 68 deg. F)/(460 + 252 deg. F) x (1 - 0.020 moist. frac.) x 40.3% = 43,686 dscfm
Controlled Filt. PM Emission Factor (Production Basis)	**0.013**	lb/ton	0.002 gr filt. PM/dscf x 43,686 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 59.5 ton Al/hr = 0.013 lb PM/ton Al
Controlled Filt. PM10 Emission Factor (Production Basis)	**0.011**	lb/ton	0.013 lb cont. filt. PM/ton x 0.85 lb filt. PM10/lb filt. PM = 0.011 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Production Basis)	**0.010**	lb/ton	0.013 lb cont. filt. PM/ton x 0.79 lb filt. PM2.5/lb filt. PM = 0.010 lb cont. filt. PM2.5/ton
Estimated Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	**84%**	--	1 - (0.013 lb cont. filt. PM/ton / 0.079 lb uncont. filt. PM/ton) = 84.17%
Controlled Total PM10 Emission Factor (Production Basis)	**0.024**	lb/ton	0.011 lb cont. filt. PM10/ton + 0.013 lb cond. PM/ton = 0.024 lb cont. total PM10/ton
Controlled Total PM2.5 Emission Factor (Production Basis)	**0.023**	lb/ton	0.010 lb cont. filt. PM2.5/ton + 0.013 lb cond. PM/ton = 0.023 lb cont. total PM2.5/ton

7.2.2 HCl Emission Factor Tied to Aluminum Metal Production

> The HCl emission factor is based on the maximum of three (3) stack test-based emission factors of similar units.

Parameter	Value		Basis
Stack Emissions			
Controlled HCl Emission Factor (Production Basis)	0.030	lb/ton	Based on the maximum of 3 emission factors from testing of similar units.
HCl Control Efficiency of Lime-Injected Baghouse	90%	--	Engineering estimate based on inlet and outlet testing results for lime-injected baghouses serving holding furnaces at secondary aluminum facilities.

7.2.3 HF Emission Factor Tied to Aluminum Metal Production

> Novelis will use solid reactive fluxing agents in the four (4) holding furnaces to purify molten metal throughout a given melt cycle prior to furnace tapping. The salt fluxing agent may contain potassium aluminum fluoride (KAlF4) or sodium aluminum fluoride (Na3AlF6). In order to quantify uncontrolled and uncaptured fluoride emissions from each furnace, Novelis has performed a conservative fluorides mass balance. A fluoride loss percentage was determined from the observed chloride loss rate during testing of similar units. Due to similarities in chemical properties, Novelis has assumed that the fluoride and chloride loss rates are equivalent.

Parameter	Value		Basis
Stack Emissions			
Sodium (Na) Molecular Weight	22.99	lb/lb-mol	Reference value from Periodic Table
Potassium (K) Molecular Weight	39.10	lb/lb-mol	
Aluminum (Al) Molecular Weight	26.98	lb/lb-mol	
Fluoride (F) Molecular Weight	19.00	lb/lb-mol	
Chloride (Cl) Molecular Weight	35.45	lb/lb-mol	
Hydrogen (H) Molecular Weight	1.01	lb/lb-mol	
Wt. % Fluoride in KAlF4 Molecule	53.49%	--	(19.00 lb/lb-mol F x 4 lbmol F) / [(39.10 lb/lb-mol K x 1 lbmol K) + (26.98 lb/lb-mol Al x 1 lbmol Al) + (19.00 lb/lb-mol F x 4 lbmol F)] = 53.49% wt. % F in KAlF4
Wt. % Fluoride in Na3AlF6 Molecule	54.30%	--	(19.00 lb/lb-mol F x 6 lbmol F) / [(22.99 lb/lb-mol Na x 3 lbmol Na) + (26.98 lb/lb-mol Al x 1 lbmol Al) + (19.00 lb/lb-mol F x 6 lbmol F)] = 54.30% wt. % F in Na3AlF6
Wt. % of either KAlF4 or Na3AlF6 in Salt	5.00%	--	SDS for either salt fluxing agent
Max. Wt. % Fluoride in Salt Flux	2.71%	--	54.30% wt. % F in Na3AlF6 x 5.00% wt. % Na3AlF6 in salt flux = 2.71% wt. % F in flux
Max. Salt Flux Injection Rate	0.68	lb/ton	Estimated as ~120 lb/cycle with a 3-4 hour cycle (avg. 3.5 hour)
Max. Fluoride Injection Rate	0.019	lb/ton	0.68 lb salt flux/ton Al x 2.71% wt. % F in salt flux = 0.02 lb F/ton
Est. Fluoride Loss Percentage to Exhaust	25.00%	--	Assumes F loss percentage is equivalent to observed Cl loss percentage during testing of similar units
Uncontrolled HF Emission Factor (Production Basis)	4.88E-03	lb/ton	0.019 lb F injected/ton x 25.00% F loss percentage x (1.01 lb/lb-mol H + 19.00 lb/lb-mol F) / 19.00 lb/lb-mol F = 4.88E-03 lb uncont. HF/ton
HF Control Efficiency of Lime-Injected Baghouse	90%	--	Engineering estimate based on HCl control efficiency
Controlled HF Emission Factor (Production Basis)	4.88E-04	lb/ton	4.88E-03 lb uncont. HF/ton x (1-90% HF cont. eff.) = 4.88E-04 lb cont. HF/ton

7.2.4 VOC Emission Factors Tied to Aluminum Metal Production

> The VOC emission factor is based on the BACT limit from a comparable facility and includes both the metal processing and natural gas combustion contributions to emissions.

Parameter	Value		Basis
Stack Emissions			
Uncontrolled VOC Emission Factor (Production Basis)	0.031	lb/ton	Based on BACT limit from comparable facility

7.2.5 Metal HAP Emission Factors Tied to Aluminum Metal Production

> The average ("Ave.") metal HAP emission factors are obtained from *Table 5. Summary of Metallic HAP Test Results* from RTR Modeling SMACT Docket Memo for "Group 1 Furnace -- Clean Charge Only."

Parameter	Value		Basis
Stack Emissions			
Lead Emission Factor (Normalized to PM Emitted)	3.27E-05	lb lead/lb PM	RTR Modeling SMACT Docket Memo Table 5 lead emission factor converted from mg/kg PM to lb/lb PM
Cont. Lead Emission Factor for Holding Furnace #4 (Production Basis)	**4.00E-07**	lb lead/ton	3.27E-05 lb lead/lb filt. PM x 0.012 lb filt. PM/ton = 4.00E-07 lb lead/ton
Cont. Lead Emission Factor for Holding Furnace #3 (Production Basis)	**4.22E-07**	lb lead/ton	3.27E-05 lb lead/lb filt. PM x 0.013 lb filt. PM/ton = 4.22E-07 lb lead/ton
Cont. Lead Emission Factor for Holding Furnace #2 (Production Basis)	**4.08E-07**	lb lead/ton	3.27E-05 lb lead/lb filt. PM x 0.012 lb filt. PM/ton = 4.08E-07 lb lead/ton
Cont. Lead Emission Factor for Holding Furnace #1 (Production Basis)	**4.11E-07**	lb lead/ton	3.27E-05 lb lead/lb filt. PM x 0.013 lb filt. PM/ton = 4.11E-07 lb lead/ton
Total Metal HAP Emission Factor (Normalized to PM Emitted)	1.98E-04	lb metal HAP/lb PM	RTR Modeling SMACT Docket Memo total metal HAP emission factor converted from mg/kg PM to lb/lb PM
Cont. Metal HAP Emission Factor for Holding Furnace #4 (Production Basis)	**2.42E-06**	lb metal HAP/ton	1.98E-04 lb metal HAP/lb filt. PM x 0.012 lb filt. PM/ton = 2.42E-06 lb metal HAP/ton
Cont. Metal HAP Emission Factor for Holding Furnace #3 (Production Basis)	**2.55E-06**	lb metal HAP/ton	1.98E-04 lb metal HAP/lb filt. PM x 0.013 lb filt. PM/ton = 2.55E-06 lb metal HAP/ton
Cont. Metal HAP Emission Factor for Holding Furnace #2 (Production Basis)	**2.47E-06**	lb metal HAP/ton	1.98E-04 lb metal HAP/lb filt. PM x 0.012 lb filt. PM/ton = 2.47E-06 lb metal HAP/ton
Cont. Metal HAP Emission Factor for Holding Furnace #1 (Production Basis)	**2.49E-06**	lb metal HAP/ton	1.98E-04 lb metal HAP/lb filt. PM x 0.013 lb filt. PM/ton = 2.49E-06 lb metal HAP/ton

7.2.6 HAP/Air Toxics Emission Factor Tied to Natural Gas Combustion

> Emission factors for HAP emissions from natural gas combustion are based on AP-42 Chapter 1.4 Tables 1.4-3 and 1.4-4.. The derivation of the emission factors is presented on a previous emission unit calculation.

7.2.7 NOX Emission Factor Tied to Natural Gas Combustion

> The emission factor for NOX from natural gas combustion is based on an emission factor provided by the selected holding furnace vendor.

Parameter	Value		Basis
Stack Emissions			
Uncontrolled NOX Emission Factor (Heat Input Basis)	0.076	lb/MMBtu	Vendor emissions estimate
Uncontrolled NOX Emission Factor (Fuel Usage Basis)	76.00	lb/MMscf	0.076 lb uncont. NOX/MMBtu x 1,000 Btu/scf = 76.00 lb uncont. NOX/hr

7.2.8 GHG Emission Factor Tied to Natural Gas Combustion

> Emission factors for GHGs from natural gas combustion are based on Subpart C of EPA's Mandatory Greenhouse Gas Reporting Rule (MRR, 40 CFR 98 Subpart C Tables C-1 and C-2). The derivation of the emission factors is presented on a previous emission unit calculation.

7.2.9 Additional Emission Factors Tied to Natural Gas Combustion

> PM emissions are accounted for in the filter house outlet emissions estimate and VOC emissions are included in the emissions estimate for aluminum melting. All other emission factors are based on reference literature (e.g., EPA's AP-42).

7.3 Potential Emission Calculations for Holding Furnaces

7.3.1 Holding Furnace #4 (Flex Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Furnace (lb/hr)	(tpy)
PM	0.012	lb/ton	Grain Loading Design Basis	61.2	535,921	0.75	3.28
PM10	0.024	lb/ton	TRC Report + UPL	61.2	535,921	1.46	6.39
PM2.5	0.023	lb/ton	TRC Report + UPL	61.2	535,921	1.41	6.17
HCl	0.030	lb/ton	Similar Source Test Data	61.2	535,921	1.84	8.04
HF	4.88E-04	lb/ton	Engineering Estimate	61.2	535,921	0.030	0.131
VOC	0.031	lb/ton	BACT limit (incl. NG contri.)	61.2	535,921	1.90	8.31
Lead	4.00E-07	lb/ton	RTR Modeling SMACT Docket	61.2	535,921	2.45E-05	1.07E-04
Total Metal HAP	2.42E-06	lb/ton	RTR Modeling SMACT Docket	61.2	535,921	1.48E-04	6.49E-04
Total HAPs	0.030	lb/ton	Sum of (HCl, HF, Metal HAP)	61.2	535,921	1.87	8.17

7.3.2 Holding Furnace #3 (Flex Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Furnace (lb/hr)	(tpy)
PM	0.013	lb/ton	Grain Loading Design Basis	61.2	535,921	0.79	3.46
PM10	0.024	lb/ton	TRC Report + UPL	61.2	535,921	1.49	6.55
PM2.5	0.024	lb/ton	TRC Report + UPL	61.2	535,921	1.44	6.32
HCl	0.030	lb/ton	Similar Source Test Data	61.2	535,921	1.84	8.04
HF	4.88E-04	lb/ton	Engineering Estimate	61.2	535,921	0.030	0.131
VOC	0.031	lb/ton	BACT limit (incl. NG contri.)	61.2	535,921	1.90	8.31
Lead	4.22E-07	lb/ton	RTR Modeling SMACT Docket	61.2	535,921	2.58E-05	1.13E-04
Total Metal HAP	2.55E-06	lb/ton	RTR Modeling SMACT Docket	61.2	535,921	1.56E-04	6.84E-04
Total HAPs	0.030	lb/ton	Sum of (HCl, HF, Metal HAP)	61.2	535,921	1.87	8.17

7.3.3 Holding Furnace #2 (CBS Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Furnace (lb/hr)	(tpy)
PM	0.012	lb/ton	Grain Loading Design Basis	59.5	521,437	0.74	3.25
PM10	0.024	lb/ton	TRC Report + UPL	59.5	521,437	1.43	6.27
PM2.5	0.023	lb/ton	TRC Report + UPL	59.5	521,437	1.38	6.05
HCl	0.030	lb/ton	Similar Source Test Data	59.5	521,437	1.79	7.82
HF	4.88E-04	lb/ton	Engineering Estimate	59.5	521,437	0.029	0.127
VOC	0.031	lb/ton	BACT limit (incl. NG contri.)	59.5	521,437	1.85	8.08
Lead	4.08E-07	lb/ton	RTR Modeling SMACT Docket	59.5	521,437	2.43E-05	1.06E-04
Total Metal HAP	2.47E-06	lb/ton	RTR Modeling SMACT Docket	59.5	521,437	1.47E-04	6.43E-04
Total HAPs	0.030	lb/ton	Sum of (HCl, HF, Metal HAP)	59.5	521,437	1.81	7.95

7.3.4 Holding Furnace #1 (CBS Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Furnace (lb/hr)	(tpy)
PM	0.013	lb/ton	Grain Loading Design Basis	59.5	521,437	0.75	3.28
PM10	0.024	lb/ton	TRC Report + UPL	59.5	521,437	1.44	6.30
PM2.5	0.023	lb/ton	TRC Report + UPL	59.5	521,437	1.39	6.08
HCl	0.030	lb/ton	Similar Source Test Data	59.5	521,437	1.79	7.82
HF	4.88E-04	lb/ton	Engineering Estimate	59.5	521,437	0.029	0.127
VOC	0.031	lb/ton	BACT limit (incl. NG contri.)	59.5	521,437	1.85	8.08
Lead	4.11E-07	lb/ton	RTR Modeling SMACT Docket	59.5	521,437	2.45E-05	1.07E-04
Total Metal HAP	2.49E-06	lb/ton	RTR Modeling SMACT Docket	59.5	521,437	1.48E-04	6.49E-04
Total HAPs	0.030	lb/ton	Sum of (HCl, HF, Metal HAP)	59.5	521,437	1.81	7.95

7.3.5 Holding Furnace #4 (Flex Line) and Holding Furnace #3 (Flex Line) - Potential Emissions Tied to Natural Gas Combustion

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis		Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate per Furnace (lb/hr)	(tpy)	Total Potential Emissions (tpy)
NOX	76.0	lb/MMscf	Vendor estimate	0.027	236.5	2.05	8.99	17.98
CO	84.0	lb/MMscf	AP-42 Table 1.4-1	0.027	236.5	2.27	9.93	19.87
SO2	0.6	lb/MMscf	AP-42 Table 1.4-2	0.027	236.5	0.016	0.071	0.14
CO2	116,977	lb/MMscf	40 CFR 98 Subpart C, Table C-1	0.027	236.5	3,158	13,834	27,667
CH4	2.2	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.027	236.5	0.060	0.26	0.52
N2O	0.22	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.027	236.5	5.95E-03	0.026	0.052
CO2e	117,097	lb/MMscf	40 CFR 98 Subpart C	0.027	236.5	3,162	13,848	27,696
Lead	5.00E-04	lb/MMscf	AP-42 Tables 1.4-4.	0.027	236.5	1.35E-05	5.91E-05	1.18E-04
Total HAPs	1.89	lb/MMscf	AP-42 Tables 1.4-3 & 1.4-4.	0.027	236.5	0.051	0.22	0.45

7.3.6 Holding Furnace #2 (CBS Line) and Holding Furnace #1 (CBS Line) - Potential Emissions Tied to Natural Gas Combustion

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis		Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate per Furnace (lb/hr)	(tpy)	Total Potential Emissions (tpy)
NOX	76.0	lb/MMscf	Vendor estimate	0.027	236.5	2.05	8.99	17.98
CO	84.0	lb/MMscf	AP-42 Table 1.4-1	0.027	236.5	2.27	9.93	19.87
SO2	0.6	lb/MMscf	AP-42 Table 1.4-2	0.027	236.5	0.016	0.071	0.14
CO2	116,977	lb/MMscf	40 CFR 98 Subpart C, Table C-1	0.027	236.5	3,158	13,834	27,667
CH4	2.2	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.027	236.5	0.060	0.26	0.52
N2O	0.22	lb/MMscf	40 CFR 98 Subpart C, Table C-2	0.027	236.5	5.95E-03	0.026	0.05
CO2e	117,097	lb/MMscf	40 CFR 98 Subpart C	0.027	236.5	3,162	13,848	27,696
Lead	5.00E-04	lb/MMscf	AP-42 Tables 1.4-4.	0.027	236.5	1.35E-05	5.91E-05	0.00
Total HAPs	1.89	lb/MMscf	AP-42 Tables 1.4-3 & 1.4-4.	0.027	236.5	0.051	0.22	0.45

8. In-Line Degassers

> Four (4) new molten aluminum holding furnaces will be installed and four (4) associated in-line degassers will be included. Two (2) holding furnaces will be troughed directly to two (2) in-line degassers and two (2) casting pits on the can line. Two (2) holding furnaces will be troughed directly to two (2) in-line degassers and two (2) casting pits on the auto/can flex line. Emissions generated by the degassers are discharged into the chamber of the actively casting holding furnace and are ultimately discharged to one of four (4) respective baghouses serving the holding furnaces and degassers.

Emission Unit IDs:	MC-16-1 & MC-33-1
Emission Unit Descriptions:	In-Line Degasser #4 (Flex Line) and In-Line Degasser #3 (Flex Line)
Emission Unit IDs:	MC-17-1 through MC-18-1
Emission Unit Descriptions:	In-Line Degasser #2 (CBS Line) and In-Line Degasser #1 (CBS Line)

8.1 In-Line Degasser Process Rates: Metal Throughput

In-Line Degasser #4 (Flex Line) and In-Line Degasser #3 (Flex Line)

8.1.1 Metal Processing Capacity

Maximum Hourly Aluminum Throughput:	109.1	ton/hr	
Maximum Annual Throughput:	535,921	tpy	In-Line Degassers on Flex Line inherently constrained by Holding Furnaces/Casting Pits

In-Line Degasser #2 (CBS Line) and In-Line Degasser #1 (CBS Line)

8.1.2 Metal Processing Capacity

Maximum Hourly Aluminum Throughput (per Degasser):	109.1	ton/hr	
Maximum Annual Throughput (per Degasser):	521,437	tpy	In-Line Degassers on CBS Line inherently constrained by Holding Furnaces/Casting Pits

8.2 Documentation of Emission Factors Used for In-Line Degassers

8.2.1 PM Emission Factors Tied to Aluminum Metal Production

> Filterable (filt.) particulate emissions generated due to reactive fluxing activities are estimated using the SMACT allowable PM emission rate defined under 40 CFR 63.1505(j). Filt. PM10 and PM2.5 emissions are estimated using EPA's PM calculator for the appropriate SCC (3-04-001-04) associated with reactive gaseous chlorine fluxing [i.e., Secondary Aluminum Production (3-04), Aluminum (3-04-001), Fluxing: Chlorination (3-04-001-04)].

Parameter	Value		Basis
Stack Emissions			
Filt. PM Emission Limit from SMACT for In-Line Fluxers	0.010	lb/ton	SMACT PM emission limit for In-Line Fluxers pursuant to 40 CFR 63.1505(j)(2)
Minimum Filt. PM Control Efficiency of Lime-Injected Baghouse	**83.76%**	**--**	**Engineering estimate derived from all Holding Furnaces calculations.**
Filt. PM10 to Filt. PM Ratio	0.53	--	EPA's PM Calculator for relevant SCC
Controlled Filt. PM10 Emission Factor (Production Basis)	0.0053	lb/ton	0.010 lb cont. filt. PM/ton x 0.53 lb filt. PM10/lb filt. PM = 0.005 lb cont. filt. PM10/ton
Filt. PM2.5 to Filt. PM Ratio	0.20	--	EPA's PM Calculator for relevant SCC
Controlled Filt. PM2.5 Emission Factor (Production Basis)	0.0020	lb/ton	0.010 lb cont. filt. PM/ton x 0.20 lb filt. PM2.5/lb filt. PM = 0.002 lb cont. filt. PM2.5/ton

8.2.2 HCl Emission Factor Tied to Aluminum Metal Production

> As no maximum HCl content has been determined at this stage in design, Novelis has decided to conservatively estimate HCl emissions by using the SMACT limit for In-Line Fluxers pursuant to 40 CFR 63.1505(j)(1).

Parameter	Value	Basis
Stack Emissions		
HCl Emission Limit from SMACT for In-Line Fluxers	0.040 lb/ton	SMACT HCl emission limit for In-Line Fluxers pursuant to 40 CFR 63.1505(j)(1)
HCl Control Efficiency of Lime-Injected Baghouse	90% --	Engineering estimate based on inlet and outlet testing results for lime-injected baghouses serving sidewell furnaces at secondary aluminum facilities.

8.3 Potential Emission Calculations for In-Line Degassers

8.3.1 In-Line Degasser #4 (Flex Line) and In-Line Degasser #3 (Flex Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)	Potential Emission Rate for All Degassers (tpy)
PM	0.010 lb/ton	SMACT Limit	109.1	535,921	1.09	2.68	5.36
PM10	5.32E-03 lb/ton	EPA PM Calculator	109.1	535,921	0.58	1.43	2.85
PM2.5	1.98E-03 lb/ton	EPA PM Calculator	109.1	535,921	0.22	0.53	1.06
HCl	0.040 lb/ton	SMACT Limit	109.1	535,921	4.37	10.72	21.44
Total HAPs	0.040 lb/ton	HC Only HAP- SMACT Limit	109.1	535,921	4.37	10.72	21.44

8.3.2 In-Line Degasser #2 (CBS Line) and In-Line Degasser #1 (CBS Line) - Potential Emissions Tied to Aluminum Metal Production (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)	Total Potential Emission Rate for All Degassers (tpy)
PM	0.010 lb/ton	SMACT Limit	109.1	521,437	1.09	2.61	5.21
PM10	5.32E-03 lb/ton	EPA PM Calculator	109.1	521,437	0.58	1.39	2.77
PM2.5	1.98E-03 lb/ton	EPA PM Calculator	109.1	521,437	0.22	0.52	1.03
HCl	0.040 lb/ton	SMACT Limit	109.1	521,437	4.37	10.43	20.86
Total HAPs	0.040 lb/ton	HC Only HAP- SMACT Limit	109.1	521,437	4.37	10.43	20.86

9. Sow Dryers

> Two (2) sow dryers will be installed to dry and preheat charge materials prior to predominantly charging into the two (2) round top melting furnaces included in the proposed project's equipment scope. Preheated charge materials can also be supplied to the main hearth flues of the sidewell and NDC furnaces. Heat will be provided through the use of natural gas-fired burners. Emissions from each sow dryer will exhaust to a dedicated, uncontrolled stack for release to the atmosphere.

Emission Unit IDs:	**MC-19-1**
Emission Unit Descriptions:	**Sow Dryer #2 (Flex Line)**
Emission Unit IDs:	**MC-20-1**
Emission Unit Descriptions:	**Sow Dryer #1 (CBS Line)**

9.1 Sow Dryer Process Rates: Metal Throughput and Gas Firing Rate

9.1.1 Metal Processing Capacity

Sow Dryer #2 (Flex Line)

Maximum Aluminum Batch Size:	**156.1**	tons/batch
Nominal Batch Time:	**6.0**	hours/batch
Maximum Hourly Aluminum Throughput:	**26.01**	tons/hr
Annual Hours of Operation:	8,760	hours/year
Maximum Annual Throughput:	**227,848**	tpy

Sow Dryer #1 (CBS Line)

Maximum Aluminum Batch Size:	**156.1**	tons/batch
Nominal Batch Time:	**6.0**	hours/batch
Maximum Hourly Aluminum Throughput:	**26.01**	tons/hr
Annual Hours of Operation:	8,760	hours/year
Maximum Annual Throughput:	**227,848**	tpy

9.1.2 Sow Dryer Natural Gas Firing Rate

> The maximum hourly emissions from the Sow Dryers are a function of the maximum gas usage, which is based on the heat input capacity of the burners and the heating value of the gas consumed at the plant.

Sow Dryer #2 (Flex Line)

Maximum Burner Heat Input Capacity:	**30.0**	MMBtu/hr	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Natural Gas Usage:	**0.030**	MMscf/hr	= 30.0 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Natural Gas Usage:	**175.2**	MMscf/yr	**Proposed annual operating limit based on original PSD permit basis for Sow Dryers**

Sow Dryer #1 (CBS Line)

Maximum Burner Heat Input Capacity:	**30.0**	MMBtu/hr	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Natural Gas Usage:	**0.030**	MMscf/hr	= 30.0 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Natural Gas Usage:	**175.2**	MMscf/yr	**Proposed annual operating limit based on original PSD permit basis for Sow Dryers**

9.2 Documentation of Emission Factors for NOX and CO

> **Potential emissions of NOX from the Sow Dryers are calculated based on performance specifications for the burner systems provided by the selected sow dryer vendor.** Potential emissions of CO from the Sow Dryers are calculated based on performance specifications specified for equipment procurement. Total PM10 and PM2.5 emissions are calculated by applying a filterable to total PM ratio to the AP-42 value for filterable PM. The ratio was calculated using data from EPA's SPECIATE database for Natural Gas Combustion - Composite with no controls. The potential emission factor derivations are presented here for reference. All other emission factors are based on reference literature (e.g., EPA's AP-42 and 40 CFR 98).

9.2.1 NOX Emission Factor

Parameter	Value	Units	Basis
NOX Heat Input Rate-Based Emission Factor	**0.109**	lb/MMBtu	**Vendor emissions estimate**
NOX Natural Gas Usage Rate-Based Emission Factor	**109.2**	lb/MMscf	0.109 lb NOX/MMBtu x 1,000 MMBtu/MMscf = 109.2 lb NOX/MMscf

9.2.2 CO Emission Factor

Parameter	Value	Units	Basis
CO Heat Input Rate-Based Emission Factor	0.073	lb/MMBtu	Similar Unit Vendor Estimates
CO Natural Gas Usage Rate-Based Emission Factor	73.0	lb/MMscf	0.073 lb CO/MMBtu x 1,000 MMBtu/MMscf = 73.0 lb CO/MMscf

9.2.3 PM Emission Factors

Parameter	Value	Units	Basis
Filt. PM Emission Factor	1.9	lb/MMscf	AP-42 Table 1.4-2 PM (Filterable) Emission Factor
Filt. PM2.5 to Total PM2.5 Emissions Ratio	0.55		Based on the uncontrolled Natural Gas Combustion - Composite speciation profile (Profile ID 91112) from the EPA SPECIATE Data Browser for the 0-2.5 µm particle size range
Total PM2.5 Emission Factor	3.5	lb/MMscf	= 1.9 lb/MMscf / 0.55 filt. PM2.5/tot. PM2.5
Total PM10 Emission Factor	3.5	lb/MMscf	Based on the assumption that all filterable PM generated is less than 2.5 µm

9.3 Summary of Sow Dryer Future Potential Emissions

Pollutant	Natural Gas Combustion Emission Factor Value	Units	Natural Gas Usage Rates Hourly Value (MMscf/hr)	Annual Value (MMscf/yr)	Potential Emission Rate of Sow Dryer (lb/hr)	(tpy)	Potential Emission Rate of All Sow Dryers (tpy)	Emission Factor Basis
PM	1.9	lb/MMscf	0.030	175.20	0.057	0.17	0.33	AP-42 Table 1.4-2
PM10	3.5	lb/MMscf	0.030	175.20	0.104	0.30	0.61	AP-42 Table 1.4-2 + EPA Speciate Database
PM2.5	3.5	lb/MMscf	0.030	175.20	0.104	0.30	0.61	AP-42 Table 1.4-2 + EPA Speciate Database
NOX	109.2	lb/MMscf	0.030	175.20	3.28	9.57	19.13	Vendor estimate
CO	73.0	lb/MMscf	0.030	175.20	2.19	6.39	12.79	Vendor estimate
SO2	0.6	lb/MMscf	0.030	175.20	0.018	0.053	0.11	AP-42 Table 1.4-2
VOC	5.50	lb/MMscf	0.030	175.20	0.17	0.48	0.96	AP-42 Table 1.4-2
CO2	116,977	lb/MMscf	0.030	175.20	3,509	10,247	20,494	40 CFR 98 Subpart C, Table C-1
CH4	2.2	lb/MMscf	0.030	175.20	0.066	0.19	0.39	40 CFR 98 Subpart C, Table C-2
N2O	0.22	lb/MMscf	0.030	175.20	6.61E-03	0.019	0.04	40 CFR 98 Subpart C, Table C-2
CO2e	117,097	lb/MMscf	0.030	175.20	3,513	10,258	20,515	40 CFR 98 Subpart C
Lead	5.00E-04	lb/MMscf	0.030	175.20	1.50E-05	4.38E-05	8.76E-05	AP-42 Table 1.4-4.
Total HAPs	1.89	lb/MMscf	0.030	175.20	0.057	0.17	0.33	AP-42 Tables 1.4-3 & 1.4-4.

10. Dross House

> Dross produced during aluminum melting and molten aluminum processing activities in each of the furnaces and degassers will be collected and transported to a dedicated dross processing building. Once there, dross is cooled, stored, loaded into trucks and eventually sold to outside firms for processing and metal reclamation. Emissions generated by dross handling activities will be collected and ducted to shared Hot Baghouse #2 also serving the Decoater #2 (CBS Line).

Emission Unit IDs: **MC-21-1**
Emission Unit Descriptions: **Dross House**

10.1 Dross House Process Rates: Metal Throughput

10.1.1 Metal Processing Capacity

Maximum Hourly Dross Throughput:	**10.87**	ton/hr	Maximum hourly dross process rate obtained from maximum dross generation rate for each melting furnace, holding furnace, and in-line degasser type (lb dross/lb aluminum throughput) and maximum hourly aluminum process rates for each dross generation source.
Maximum Annual Throughput:	**95,191**	tpy	

10.2 Documentation of Emission Factors Used for Dross House

10.2.1 PM Emission Factors Tied to Dross Processing

> Filterable (filt.) particulate emissions at the outlet of the proposed **Hot Baghouse #2** are based on the baghouse performance specification.

> Uncontrolled particulate emissions are based on relevant emission factors in AP-42 Chapter 11.17 for Lime Manufacturing. Similar secondary aluminum facilities have used this AP-42 chapter to estimate uncontrolled PM emission rates for dross handling and loading. Dross is a term that applies to several different types of slags that are generated on the surface of molten aluminum. From among the available Mineral Products industry sections within AP-42 Chapter 11, the lime manufacturing provides a reasonable yet conservative basis for uncontrolled particulate emissions associated with dross handling.

> The Dross House will have one drop point associated with the dross pot dumping station and one truck loadout operation; therefore, the corresponding emission factors from AP-42 11.17 are provided and summed below in order to calculate a cumulative uncontrolled emission rate in lb/ton dross processed. The PM control efficiencies for the Dross House baghouse are then calculated from the exit grain-loading based controlled emission rate expressed on a dross process rate basis (i.e., lb/ton) and the AP-42 Chapter 11.17 uncontrolled emission factors.

> Filt. PM10 and PM2.5 emission factors are calculated using data presented in EPA's PM calculator database for the appropriate SCC (3-04-001-07) associated with hot dross processing [i.e., Secondary Metal Production (3-04), Aluminum (3-04-001), Hot Dross Processing (3-04-001-07)].

> There are no condensable PM emissions associated with this process.

Parameter	Value		Basis
Stack Emissions			
Controlled (Cont.) Filt. PM Emission Factor (Grain Loading Basis)	0.002	gr/dscf	Exit grain loading design basis of baghouse
Hot Baghouse #2 Baghouse Flow Capacity (Actual Conditions)	194,700	acfm	Hot Baghouse #2 design basis
Nominal Stack Temperature for Hot Baghouse #2	**214**	deg. F	Nominal stack exit temperature from Hot Baghouse #2 design basis
Minimum Nominal Moisture Content for Hot Baghouse #2	**0.040**	moist. frac.	**Minimum nominal stack gas moisture content from Hot Baghouse #2 design basis**
Flow Contribution from Dross House to Hot Baghouse #2	**61.6%**	%	90,115 dscfm from Dross House / 161,706 dscfm for Hot Baghouse #2 total flow capacity = 61.6% Flow Cont. from Dross House; Ventilation system design evaluation for Hot Baghouse #2 design basis
Hot Baghouse #2 Flow Capacity Contribution from Dross House (Standard Conditions)	**90,115**	dscfm	194,700 acfm x (460 + 68 deg. F)/(460 + 214 deg. F) x (1 - 0.040 moist. frac.) x 61.6% = 90,115 dscfm
Controlled Filt. PM Emission Factor (Dross Process Rate Basis)	**0.142**	lb/ton	0.002 gr filt. PM/dscf x 90,115 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 10.9 ton Al/hr = 0.14 lb PM/ton Al
Filt. PM10 to Filt. PM Ratio	0.94	--	EPA's PM Calculator for appropriate SCC
Filt. PM2.5 to Filt. PM Ratio	0.78	--	EPA's PM Calculator for appropriate SCC
Controlled Filt. PM10 Emission Factor (Dross Process Rate Basis)	**0.134**	lb/ton	0.14 lb cont. filt. PM/ton x 0.94 lb filt. PM10/lb filt. PM = 0.134 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Dross Process Rate Basis)	**0.111**	lb/ton	0.14 lb cont. filt. PM/ton x 0.78 lb filt. PM2.5/lb filt. PM = 0.111 lb cont. filt. PM2.5/ton
Uncontrolled Filt. PM Emission Factor for one (1) Drop Point	2.20	lb/ton	AP-42 Table 11.17-4 for Transfer and Conveying (SCC 3-05-016-15) in lb/ton product loaded
Uncontrolled Filt. PM Emission Factor for one (1) Drop Point	1.50	lb/ton	AP-42 Table 11.17-4 for Product Loading, Open Truck (SCC 3-05-016-27) in lb/ton product loaded
Uncontrolled (Uncont.) Filt. PM Emission Factor (Production Basis)	3.70	lb/ton	Sum of AP-42 Chapter 11 Lime Manufacturing Transfer EFs for Drop Point (2.20 lb/ton) and Product Loading (1.50 lb/ton)
Uncontrolled Filt. PM10 Emission Factor (Production Basis)	3.48	lb/ton	2.20 lb uncont. filt. PM/ton x 0.94 lb filt. PM10/lb filt. PM = 3.48 lb uncont. filt. PM10/ton
Uncontrolled Filt. PM2.5 Emission Factor (Production Basis)	2.89	lb/ton	2.20 lb uncont. filt. PM/ton x 0.78 lb filt. PM2.5/lb filt. PM = 2.89 lb uncont. filt. PM2.5/ton
Estimated Filt. PM/PM10/PM2.5 Control Efficiency for Baghouse	**96.16%**	--	1 - (0.142 lb cont. filt. PM/ton / 3.70 lb uncont. filt. PM/ton) = 96.16%

10.3 Potential Emission Calculations for Dross House

10.3.1 Potential Emissions Tied to Dross Processing (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.142	lb/ton	Grain Loading Design Basis	10.9	95,191	1.54	6.77
PM10	0.134	lb/ton	EPA PM Calculator	10.9	95,191	1.45	6.36
PM2.5	0.111	lb/ton	EPA PM Calculator	10.9	95,191	1.20	5.28

11. Dross Presses

> Dross produced during aluminum melting and molten aluminum processing activities in each of the melting furnaces, holding furnaces, and in-line degassers can be routed to one (1) of **two (2)** Dross Presses used to extract molten metal from the dross prior to routing it to the Dross House. Each Dross Press will be ducted to **its own integrated filtration unit (IFU) equipped with a stack venting interior to the production building.**

Emission Unit IDs:	**MC-22-1 and MC-24-1**
Emission Unit Descriptions:	**Dross Press #2 (Flex Line) and Dross Press #1 (CBS Line)**

11.1 Dross Press Process Rates: Metal Throughput

11.1.1 Metal Processing Capacity

Maximum Hourly Dross Throughput **(per Unit)**:	**7.2**	ton/hr
Maximum Annual Throughput **(per Unit)**:	**63,225**	tpy

11.2 Documentation of Emission Factors Used for the Dross Presses

11.2.1 PM Emission Factors Tied to Dross Processing

> Filterable (filt.) particulate emissions at the outlet **of the IFU are based on the IFU vendor's design basis and the exit grain loading design basis for a typical bin vent or integral filter unit in a similar material handling context.**

> Filt. PM10 and PM2.5 emission factors are calculated using data presented in EPA's PM calculator database for the appropriate SCC (3-04-001-07) associated with hot dross processing [i.e., Secondary Metal Production (3-04), Aluminum (3-04-001), Hot Dross Processing (3-04-001-07)].

> There are no condensable PM emissions associated with this process.

Parameter	Value		Basis
Stack Emissions			
Controlled (Cont.) Filt. PM Emission Factor (Grain Loading Basis)	**0.010**	gr/dscf	**Exit grain loading design basis for IFU**
Dross Press IFU #1/#2 Flow Capacity (Actual Conditions)	**1,177**	acfm	Dross Press IFU #1/#2 design basis
Nominal Stack Temperature for Dross Press IFU #1/#2	**82.4**	deg. F	Dross Press IFU #1/#2 design basis
Dross Press IFU #1/#2 Flow Capacity (Standard Conditions)	**1,947**	dscfm	1,177 acfm x (460 + 68 deg. F)/(460 + 82.4 deg. F) = 1,947 dscfm; Assuming minimal moisture in Dross Press exhaust
Controlled Filt. PM Emission Factor (Dross Process Rate Basis)	**0.023**	lb/ton	0.010 gr filt. PM/dscf x 1,947 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 7.2 ton Dross/hr = 2.31E-02 lb PM/ton Al
Filt. PM10 to Filt. PM Ratio	0.94	--	EPA's PM Calculator for appropriate SCC
Filt. PM2.5 to Filt. PM Ratio	0.78	--	EPA's PM Calculator for appropriate SCC
Controlled Filt. PM10 Emission Factor (Dross Process Rate Basis)	**0.022**	lb/ton	2.31E-02 lb cont. filt. PM/ton x 0.94 lb filt. PM10/lb filt. PM = 2.17E-02 lb cont. filt. PM10/ton
Controlled Filt. PM2.5 Emission Factor (Dross Process Rate Basis)	**0.018**	lb/ton	2.31E-02 lb cont. filt. PM/ton x 0.78 lb filt. PM2.5/lb filt. PM = 1.80E-02 lb cont. filt. PM2.5/ton

11.3 Potential Emission Calculations for the Dross Presses

11.3.1 Potential Emissions Tied to Dross Processing (Stack)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Dross Press (lb/hr)	(tpy)	Total Potential Emissions (tpy)
PM	0.023	lb/ton	Grain Loading Design Basis	7.2	63,225	0.17	0.73	1.46
PM10	0.022	lb/ton	EPA PM Calculator	7.2	63,225	0.16	0.69	1.37
PM2.5	0.018	lb/ton	EPA PM Calculator	7.2	63,225	0.13	0.57	1.14

12. Casting Process Emission Sources

> Successful casting relies on a minimal temperature drop between the Holding Furnace and the casting machine. Therefore, the ceramic foam filter (CFF) and deep bed filter (DBF) box refractory will also be preheated to ensure that box inside temperature is within acceptable range and does not lead to temperature drop of molten metal. This heat will be provided by dedicated natural gas-fired preheaters. The CFF/DBF preheaters are sources of uncaptured natural gas combustion byproduct emissions. The CFF/DBF preheater burners do not have stacks and thus combustion by-product emissions are released into the Melting & Casting Area building.

> On an intermittent basis between ingot casting cycles, Novelis plans to apply a small amount of a synthetic base lubricating oil stock to the ingot casting molds to facilitate the direct chill (DC) casting process and prevent the molten aluminum from adhering to the surface of the molds. The high temperature of the molten aluminum is assumed to eventually drive off the lubricant in the form of VOC emissions released into the Melting & Casting Area building.

Emission Unit IDs:	**MC-26-1**
Emission Unit Descriptions:	**Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC4 (Flex Line)**
Emission Unit IDs:	**MC-34-1**
Emission Unit Descriptions:	**Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC3 (Flex Line)**
Emission Unit IDs:	**MC-27-1**
Emission Unit Descriptions:	**Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC2 (CBS Line)**
Emission Unit IDs:	**MC-28-1**
Emission Unit Descriptions:	**Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC1 (CBS Line)**
Emission Unit IDs:	**MC-31-1**
Emission Unit Descriptions:	**DC1-DC4 Casting Unit- Lubricant Usage**

12.1 CFF/DBF Preheater Gas Usage Rate

> The maximum hourly emissions from the Filter Box Preheaters are a function of the maximum gas usage, which is based on the heat input capacity of the burners and the heating value of the gas consumed at the plant.

12.1.1 Preheater Natural Gas Firing Rates for the CFF & DBF Filter Systems for DC3 and DC4 (Flex Line)

Heat input capacity of CFF preheaters:	0.32	MMBtu/hr	Design specification
Heat input capacity of each DBF preheaters:	6.00	MMBtu/hr	Design specification
Heating value of natural gas at plant:	1,000	Btu/scf	
Maximum hourly gas usage rate of CFF preheaters:	0.00032	MMscf/hr	= 0.32 MMBtu/hr / 1,000 Btu/scf
Maximum hourly gas usage rate of DBF preheaters:	0.0060	MMscf/hr	= 6.00 MMBtu/hr / 1,000 Btu/scf

12.1.2 Preheater Natural Gas Firing Rates for the CFF & DBF Filter Systems for DC1 and DC2 (CBS Line)

Heat input capacity of CFF preheaters:	0.32	MMBtu/hr	Design specification
Heat input capacity of each DBF preheaters:	6.00	MMBtu/hr	Design specification
Heating value of natural gas at plant:	1,000	Btu/scf	
Maximum hourly gas usage rate of CFF preheaters:	0.00032	MMscf/hr	= 0.32 MMBtu/hr / 1,000 Btu/scf
Maximum hourly gas usage rate of DBF preheaters:	0.0060	MMscf/hr	= 6.00 MMBtu/hr / 1,000 Btu/scf

12.2 DC1-DC4 Casting Unit Lubricant Usage Rate

> The maximum hourly VOC emissions from lubricant usage in the DC1-DC4 casting units are a function of the maximum lubricant usage rate.

DC1-DC4 Casting Unit- Lubricant Usage

Maximum hourly lubricant usage rate:	0.047	gal/hr	Operating experience from similar casting units

12.3 Documentation of Emission Factors Used for CFF & DBF Preheaters

> The potential emission factor derivations for select pollutants generated by the CFF/DBF preheaters are presented here for reference. Refer to Section 9.2.3 for the PM10 and PM2.5 emission factor derivation. All other emission factors are based on reference literature (e.g., EPA's AP-42 and 40 CFR 98).

> **Potential emissions of NOX from the CFF/DBF preheaters are calculated based on emissions estimates provided by burner vendor.**

12.3.1 NOX Emission Factor for CFF Preheater

Parameter	Value		Basis
NOX Exhaust Concentration	65	ppmv	**Vendor emissions estimate for CFF preheater burner performance**
NO2 Molecular Weight	46	lb/lbmol	Consistent with Method 19, assume all NOX is NO2
Molar Volume Conversion Factor	386	scf/lbmol	Ideal gas law at 68 deg. F and 1 atm
NOX Exhaust Concentration	7.75E-06	lb NOX/dscf	= 65 lbmol NOX/lbmol gas x 46 lb NO2/1 lbmol NO2 x 1 lbmol gas/386 scf gas
F-Factor	8,710	dscf/MMBtu	EPA Method 19 Table 19-2 F-Factor for Various Fuels dry F-factor for natural gas
O2 Concentration for Emission Factor Correction	3	%	**Vendor emissions estimate data**
NOX Heat Input Rate-Based Emission Factor	0.079	lb/MMBtu	= 7.75E-06 lb NO2/dscf x 8,710 dscf/MMBtu x 20.9% / (20.9% - 3%)
NOX Natural Gas Usage Rate-Based Emission Factor	78.86	lb/MMscf	= 0.079 lb NO2/MMBtu x 1,000 MMBtu/MMscf

12.3.2 NOX Emission Factor for DBF Preheaters

Parameter	Value		Basis
NOX Exhaust Concentration	62.7	ppmv	**Vendor emissions estimate for DBF preheater burner performance**
NOX Exhaust Concentration	7.49E-06	lb NOX/dscf	= 63 lbmol NOX/lbmol gas x 46 lb NO2/1 lbmol NO2 x 1 lbmol gas/386 scf gas
O2 Concentration for Emission Factor Correction	3	%	Vendor emissions estimate data
NOX Heat Input Rate-Based Emission Factor	0.076	lb/MMBtu	= 7.49E-06 lb NO2/dscf x 8,710 dscf/MMBtu x 20.9% / (20.9% - 3%)
NOX Natural Gas Usage Rate-Based Emission Factor	76.13	lb/MMscf	= 0.076 lb NO2/MMBtu x 1,000 MMBtu/MMscf

12.4 Documentation of Emission Factors Used for DC1-DC4 Casting Unit Lubricant Usage

> The potential emission factor for VOC emissions from casting unit lubricant usage is based on a conservative assumption for 100% of the applied lubricant being evaporated to the air phase as opposed to discarded with the ingot molds or adhering to the surface of the cast ingot.

12.4.1 VOC Emission Factor

Parameter	Value	Basis
Lubricant Density	6.96 lb/gal	Density from SDS for representative casting lubricant (MOBIL GARGOYLE ARCTIC SHC 226E, or equivalent)
VOC Emission Factor	6.96 lb/gal	Assuming 100% loss of applied lubricant makes VOC emission factor equivalent to lubricant density

12.5 Potential Emission Calculations for DC1-DC4

12.5.1 Potential Emissions Tied to DBF Preheaters for Flex Line

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Gas Usage (MMscf/hr)	Potential Emission Rate per DBF (lb/hr)	Potential Emission Rate per DBF (tpy)	Total Potential Emissions (lb/hr)	Total Potential Emissions (tpy)
NOX	76.1	Vendor Estimate	0.0060	0.46	2.00	0.91	4.00
CO	84.0	AP-42 Table 1.4-1	0.0060	0.50	2.21	1.01	4.42
PM	1.9	AP-42, Chp.1.4, Tbl 1.4-2	0.0060	1.14E-02	4.99E-02	2.28E-02	9.99E-02
PM10	3.5	Engineering Estimate	0.0060	2.08E-02	9.13E-02	4.17E-02	1.83E-01
PM2.5	3.5	Engineering Estimate	0.0060	2.08E-02	9.13E-02	4.17E-02	1.83E-01
VOC	5.5	AP-42, Chp.1.4, Tbl 1.4-2	0.0060	3.30E-02	1.45E-01	6.60E-02	2.89E-01
SO2	0.6	AP-42, Chp.1.4, Tbl 1.4-2	0.0060	3.60E-03	1.58E-02	7.20E-03	3.15E-02
CO2	116,977	40CFR98 Subpart C, Table C-1	0.0060	702	3,074	1,404	6,148
CH4	2.2	40CFR98 Subpart C, Table C-2	0.0060	1.32E-02	5.79E-02	2.65E-02	1.16E-01
N2O	0.22	40CFR98 Subpart C, Table C-2	0.0060	1.32E-03	5.79E-03	2.65E-03	1.16E-02
CO2e	117,097	40CFR98 Subpart A	0.0060	703	3,077	1,405	6,155
Lead	5.00E-04	AP-42 Table 1.4-4.	0.0060	3.00E-06	1.31E-05	6.00E-06	2.63E-05
Total HAPs	1.89	AP-42 Tables 1.4-3 & 1.4-4.	0.0060	1.13E-02	4.96E-02	2.27E-02	9.93E-02

12.5.2 Potential Emissions Tied to CFF Preheaters for Flex Line

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Gas Usage (MMscf/hr)	Potential Emission Rate per CFF (lb/hr)	Potential Emission Rate per CFF (tpy)	Total Potential Emissions (lb/hr)	Total Potential Emissions (tpy)
NOX	78.9	Vendor Estimate	0.00032	0.03	0.11	0.05	0.22
CO	84.0	AP-42 Table 1.4-1	0.00032	0.03	0.12	0.05	0.24
PM	1.9	AP-42, Chp.1.4, Tbl 1.4-2	0.00032	6.08E-04	2.66E-03	1.22E-03	5.33E-03
PM10	3.5	Engineering Estimate	0.00032	1.11E-03	4.87E-03	2.22E-03	9.73E-03
PM2.5	3.5	Engineering Estimate	0.00032	1.11E-03	4.87E-03	2.22E-03	9.73E-03
VOC	5.5	AP-42, Chp.1.4, Tbl 1.4-2	0.00032	1.76E-03	7.71E-03	3.52E-03	1.54E-02
SO2	0.6	AP-42, Chp.1.4, Tbl 1.4-2	0.00032	1.92E-04	8.41E-04	3.84E-04	1.68E-03
CO2	116,977	40CFR98 Subpart C, Table C-1	0.00032	37	164	75	328
CH4	2.2	40CFR98 Subpart C, Table C-2	0.00032	7.05E-04	3.09E-03	1.41E-03	6.18E-03
N2O	0.22	40CFR98 Subpart C, Table C-2	0.00032	7.05E-05	3.09E-04	1.41E-04	6.18E-04
CO2e	117,097	40CFR98 Subpart A	0.00032	37	164	75	328
Lead	5.00E-04	AP-42 Table 1.4-4.	0.00032	1.60E-07	7.01E-07	3.20E-07	1.40E-06
Total HAPs	1.89	AP-42 Tables 1.4-3 & 1.4-4.	0.00032	6.04E-04	2.65E-03	1.21E-03	5.29E-03

12.5.3 Potential Emissions Tied to DBF Preheaters for CBS Line

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Gas Usage (MMscf/hr)	Potential Emission Rate per DBF (lb/hr)	Potential Emission Rate per DBF (tpy)	Total Potential Emissions (lb/hr)	Total Potential Emissions (tpy)
NOX	76.1	Vendor Estimate	0.0060	0.46	2.00	0.91	4.00
CO	84.0	AP-42 Table 1.4-1	0.0060	0.50	2.21	1.01	4.42
PM	1.9	AP-42, Chp.1.4, Tbl 1.4-2	0.0060	1.14E-02	4.99E-02	2.28E-02	9.99E-02
PM10	3.5	Engineering Estimate	0.0060	2.08E-02	9.13E-02	4.17E-02	1.83E-01
PM2.5	3.5	Engineering Estimate	0.0060	2.08E-02	9.13E-02	4.17E-02	1.83E-01
VOC	5.5	AP-42, Chp.1.4, Tbl 1.4-2	0.0060	3.30E-02	1.45E-01	6.60E-02	2.89E-01
SO2	0.6	AP-42, Chp.1.4, Tbl 1.4-2	0.0060	3.60E-03	1.58E-02	7.20E-03	3.15E-02
CO2	116,977	40CFR98 Subpart C, Table C-1	0.0060	702	3,074	1,404	6,148
CH4	2.2	40CFR98 Subpart C, Table C-2	0.0060	1.32E-02	5.79E-02	2.65E-02	1.16E-01
N2O	0.22	40CFR98 Subpart C, Table C-2	0.0060	1.32E-03	5.79E-03	2.65E-03	1.16E-02
CO2e	117,097	40CFR98 Subpart A	0.0060	703	3,077	1,405	6,155
Lead	5.00E-04	AP-42 Table 1.4-4.	0.0060	3.00E-06	1.31E-05	6.00E-06	2.63E-05
Total HAPs	1.89	AP-42 Tables 1.4-3 & 1.4-4.	0.0060	1.13E-02	4.96E-02	2.27E-02	9.93E-02

12.5.4 Potential Emissions Tied to CFF Preheaters for CBS Line

> Emission factors shown below are the natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Gas Usage (MMscf/hr)	Potential Emission Rate per CFF (lb/hr)	Potential Emission Rate per CFF (tpy)	Total Potential Emissions (lb/hr)	Total Potential Emissions (tpy)
NOX	78.9	Vendor Estimate	0.0003	0.03	0.11	0.05	0.22
CO	84.0	AP-42 Table 1.4-1	0.0003	0.03	0.12	0.05	0.24
PM	1.9	AP-42, Chp.1.4, Tbl 1.4-2	0.0003	6.08E-04	2.66E-03	1.22E-03	5.33E-03
PM10	3.5	Engineering Estimate	0.0003	1.11E-03	4.87E-03	2.22E-03	9.73E-03
PM2.5	3.5	Engineering Estimate	0.0003	1.11E-03	4.87E-03	2.22E-03	9.73E-03
VOC	5.5	AP-42, Chp.1.4, Tbl 1.4-2	0.0003	1.76E-03	7.71E-03	3.52E-03	1.54E-02
SO2	0.6	AP-42, Chp.1.4, Tbl 1.4-2	0.0003	1.92E-04	8.41E-04	3.84E-04	1.68E-03
CO2	116,977	40CFR98 Subpart C, Table C-1	0.0003	37	164	75	328
CH4	2.2	40CFR98 Subpart C, Table C-2	0.0003	7.05E-04	3.09E-03	1.41E-03	6.18E-03
N2O	0.22	40CFR98 Subpart C, Table C-2	0.0003	7.05E-05	3.09E-04	1.41E-04	6.18E-04
CO2e	117,097	40CFR98 Subpart A	0.0003	37	164	75	328
Lead	5.00E-04	AP-42 Table 1.4-4.	0.0003	1.60E-07	7.01E-07	3.20E-07	1.40E-06
Total HAPs	1.89	AP-42 Tables 1.4-3 & 1.4-4.	0.0003	6.04E-04	2.65E-03	1.21E-03	5.29E-03

12.6 Potential Emission Calculations for DC1-DC4 Casting Unit Lubricant Usage

Pollutant	Emission Factor (lb/gal)	Emission Factor Basis	Maximum Gas Usage (gal/hr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
VOC	6.96	Mass Balance (Assuming 100% Loss)	0.0468	0.33	1.43

13. ~~Trough Heaters~~ Molten Metal Utility Heaters

> **The natural gas-fired Trough Heaters have been removed the from the project scope. Molten Metal Utility Heaters associated with molten metal management in the Melting & Casting area have been added to the project scope and are addressed in this section of the emission calculations given their similar small natural gas combustion unit status as the original trough heaters.**

~~Emission Unit IDs:~~ ~~**MC-29-1 and MC-30-1**~~
~~Emission Unit Descriptions:~~ ~~**Trough Heaters (Flex Line) and Trough Heaters (CBS Line)**~~

> The proposed project includes a total of 46 molten metal utility heater units spread across various casting, holder, and melting areas to remove moisture present on hand tools that the operators use in close direct contact with molten metal and to support removal of molten metal blockages in the trough system. The units are identified as a preventative safety measure for molten metal protection.

> Each molten metal utility heater unit has a maximum heat input rate of 0.36 MMBtu/hr with an overall average firing rate across all units of 16.56 MMBtu/hr. The small direct-fired molten metal utility heaters will discharge into the building with no stack/vent other than building openings or HVAC system discharge points.

Emission Unit IDs: **MC-35-1**
Emission Unit Descriptions: **Molten Metal Utility Heaters**

13.1 Molten Metal Utility Heaters Usage Rate

> The maximum hourly emissions from the Molten Metal Utility Heaters are a function of the maximum gas usage, which is based on the heat input capacity of the burners and the heating value of the gas consumed at the plant.

Heat input capacity (each unit):	0.36	MMBtu/hr	Design specification
Total units:	46	Units	
Heating value of natural gas at plant:	1,000	Btu/scf	
Maximum hourly gas usage rate (each unit):	0.00036	MMscf/hr	= 0.36 MMBtu/hr / 1,000 Btu/scf
Maximum annual gas usage rate (each unit):	3.15	MMscf/yr	= 0.00036 MMscf/hr x 8,760 hr/yr
Total maximum hourly gas usage rate:	0.0166	MMscf/hr	= 0.00036 MMscf/hr x 46 Units
Total maximum annual gas usage rate:	145.1	MMscf/hr	= 3.15 MMscf/yr x 46 Units

13.2 Documentation of Emission Factors Used for Molten Metal Utility Heaters

> The potential emission factor derivations for PM10 and PM2.5 emissions generated by the Molten Metal Utility Heaters are presented in Section 9.2.3. All other emission factors are based on reference literature (e.g., EPA's AP-42 and 40 CFR 98).

13.3 Potential Emission Calculations for Molten Metal Utility Heaters

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Gas Usage (MMscf/hr)	Maximum Gas Usage (MMscf/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
NOX	100.0	AP-42, Chp.1.4, Tbl 1.4-1	0.0166	145.1	1.66	7.25
CO	84.0	AP-42, Chp.1.4, Tbl 1.4-1	0.0166	145.1	1.39	6.09
PM	1.9	AP-42, Chp.1.4, Tbl 1.4-2	0.0166	145.1	3.15E-02	0.14
PM10	3.5	Engineering Estimate	0.0166	145.1	5.75E-02	0.25
PM2.5	3.5	Engineering Estimate	0.0166	145.1	5.75E-02	0.25
VOC	5.5	AP-42, Chp.1.4, Tbl 1.4-2	0.0166	145.1	0.091	0.40
SO2	0.6	AP-42, Chp.1.4, Tbl 1.4-2	0.0166	145.1	9.94E-03	4.35E-02
CO2	116,977	40CFR98 Subpart C, Table C-1	0.0166	145.1	1,937	8,485
CH4	2.2	40CFR98 Subpart C, Table C-2	0.0166	145.1	3.65E-02	0.16
N2O	0.22	40CFR98 Subpart C, Table C-2	0.0166	145.1	3.65E-03	1.60E-02
CO2e	117,097	40CFR98 Subpart A	0.0166	145.1	1,939	8,493
Lead	5.00E-04	AP-42 Table 1.4-4.	0.0166	145.1	8.28E-06	3.63E-05
Total HAPs	1.89	AP-42 Tables 1.4-3 & 1.4-4.	0.0166	145.1	3.13E-02	0.14

14. Ingot Saws

> One Ingot Saw will be installed in the melting and casting area. The melting and casting area ingot saw will be used on a intermittent basis to cut reject ingots into smaller pieces that will fit into the melting furnaces. The operation of the Ingot Saw will generate aluminum fines (i.e., saw dust), which will be collected by an integral saw process cyclone and discharged into a hopper. Exhaust air from the cyclone will vent to a dedicated filtration unit that discharges exhaust directly into the production building. Chips generated by the saw will be transferred to a briquetting unit, which will convert the chips to consistently sized briquettes. There are no emissions associated with the briquetting process.

> **The Hot Rolling Ingot Saws (4) have been removed from the project scope.**

Emission Unit ID:	**MC-32-1**
Emission Unit Description:	**Melting & Casting Ingot Saw**

~~Emission Unit ID:~~	~~**HR-01-1**~~
~~Emission Unit Description:~~	~~**Hot Rolling Ingot Saws (4)**~~

14.1 Ingot Saw Process Rates: Metal Throughput

Melting and Casting Ingot Saw Maximum Hourly Ingot Processing Rate:	**1.5**	ingot/hr	
Melting and Casting Maximum Ingot Weight:	**49.6**	ton/ingot	
Maximum Hourly Ingot Processing Rate for Melting and Casting Ingot Saw Process:	**74.4**	ton/hr	
Maximum Annual Ingot Processing Rate for Melting and Casting Ingot Saw Process:	63,552	tpy	Proposed operating constraint based on worst-case of 3% of ingot rolling capacity is rejected

14.2 Documentation of Emission Factors Used for Ingot Saw

> **Filterable PM/PM10/PM2.5 emissions for the filtration unit dedicated to the product collection cyclone on the ingot saw are calculated from the flow capacity of the saw chip collection system and the filter's PM emissions performance specification.**

> Condensable PM emissions are excluded due to the process temperature. Therefore, filterable PM emissions are equivalent to total PM emissions.

14.2.1 Filterable Particulate Emission Factor

Parameter	Value		Basis
PM/PM10/PM2.5 Emission Factor			
Filterable PM Emissions Performance Specification for Filtration Units	10	mg/m3	Design specification for filtration unit
Filtration Unit Flow Capacity	**5,000**	m3/hr	Design specification for filtration unit
Mill Building PM/PM10/PM2.5 Removal Efficiency	90%		Using the control credit for "enclosed by building" from TCEQ's Technical Guidance for Rock Crushing Plants (RG 058, Feb. 2022) as a guide, assume building removal efficiency is 90% for PM based on high air inflow rate to building for supplying control devices and large distances between floor-level interior venting emissions sources and building openings.
Filt. PM/PM10/PM2.5 Emission Factor for Melting and Casting Ingot Saw	**1.48E-04**	lb/ton	= 10 mg/m3 / 1,000 mg/g / 453.59 g/lb x 5,000 m3/hr x (1 - 90.0% building PM/PM10/PM2.5 removal eff.)/ 74.4 ton ingot/hr

14.2.2 VOC Emission Factor

Parameter	Value		Basis
Hourly Average Lubricant Application Rate	2.65	lb lubricant/hr	Design basis of saw lubricant application system
Lubricant Application Rate - Production Basis for Melting and Casting Area Saw	3.56E-02	lb/ton	= 2.65 lb lubricant applied / hr / 74.41 ton ingot processed / hr
VOC Emission Factor	3.56E-02	lb/ton	Conservatively assumes 100% VOC loss rate of amount of Ingot Saw lubricant applied

14.3 Potential Emission Calculations for Melting & Casting Ingot Saw

14.3.1 Criteria Pollutant Potential Emission Calculations for Melting & Casting Ingot Saw

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	1.48E-04	Engineering Estimate	74.4	63,552	0.01	4.71E-03
PM10	1.48E-04	Engineering Estimate	74.4	63,552	0.01	4.71E-03
PM2.5	1.48E-04	Engineering Estimate	74.4	63,552	0.01	4.71E-03
VOC	3.56E-02	Engineering Estimate	74.4	63,552	2.65	1.13

14.3.2 HAP Potential Emission Calculations for Melting & Casting Ingot Saw

Toxic Air Pollutant	Hazardous Air Pollutant? (Y/N)	Worst-case Percentage of Particulate Matter Emissions[1] (wt.%)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Manganese (Mn)	Y	1.40%	1.54E-04	6.59E-05
Chromium (Cr)	Y	0.35%	3.86E-05	1.65E-05
Nickel (Ni)	Y	0.20%	2.20E-05	9.42E-06
Total HAPs (Sum of Mn, Cr, Ni)	Y	1.95%	2.15E-04	9.18E-05

[1] Novelis has conservatively assumed all PM emitted from the Melting & Casting Ingot Saw is in the form of aluminum alloy fines as opposed to the other forms of PM that are likely to comprise the PM emissions profile of the ingot saw (e.g., dirt, rust, grit, etc.). To determine the worst-case content of each trace metal regulated as a HAP within the aluminum alloys processed by the ingot saw, Novelis compiled specification data for all aluminum alloys planned to be processed by the ingot saw. The maximum individual trace metal content for each alloy was compiled into a data table, and the maximum overall content for the specific trace metal was used as a worst-case approximation for the amount of the trace metal that could be found in the PM emissions from the ingot saw. This selective approach produces a worst-case emissions profile of HAP emissions which could never be achieved in practice on an annual basis because Novelis would never process a single alloy on a continuous basis through the ingot saw.

15. Ingot Scalper #1

> One (1) Ingot Scalper will be installed in the Hot Rolling area. The scalper will be used for ingot rolling surface "machining" to promote flatness prior to transferring the ingots to the Hot Rolling Mill. The operation of the Ingot Scalper will generate aluminum chips, which will be captured by a chip collection hood and routed to a dedicated crusher. Fans will be used to pneumatically convey these crushed chips through cyclones. Exhaust air from the scalper chip production collection cyclones (inherent process equipment) will be discharged directly to an add-on emissions control device (filtration unit) for PM generated by the scalpers and primary chip handling system. The collected chips will be transferred to chip storage bins. After passing through a de-dusting process, these chips will eventually be fed to**a secondary pneumatic chip conveyance process for briquetting**.

Emission Unit ID:	**HR-02-1**
Emission Unit Description:	**Scalper #1**

15.1 Ingot Scalper Process Rates: Metal Throughput

Scalper 1 Maximum Hourly Ingot Processing Rate:	**13.50**	ingot/hr	
Maximum Ingot Weight:	**46.3**	ton/ingot	
Maximum Hourly Ingot Processing Rate for Ingot Scalper #1 Process:	**625.1**	ton/hr	
Maximum Annual Ingot Processing Rate for Ingot Scalper #1:	2,118,414	tpy	Proposed operating constraint

15.2 Documentation of Emission Factors Used for Ingot Scalpers

15.2.1 Filterable Particulate Emission Factors Before Process Cyclone

> PM emissions are estimated based on the design specifications of the filtration unit. VOC emissions are estimated based on the results of the August 2018 performance testing for a similar unit (Logan Aluminum Scalper 2).

15.2.2 Particulate Emission Factors for Scalper

Parameter	Value		Basis
Total PM/PM10/PM2.5 Emissions Performance Specification for Filtration Units	0.001	gr/dscf	Design specification for filtration unit
Filtration Unit Flow Capacity (Actual Conditions)	**78,063**	acfm	Design specification for filtration unit
Nominal Temperature of Scalper Product Collection Cyclone Exhaust	80	deg. F	Nominal temperature (low end for worst-case emissions factor) for Scalper exhaust based on temperature profile of main mill building "room air" drawn into collection system and added heat from the chip crushing and pneumatic conveyance process.
Nominal Moisture Content of Scalper Product Collection Cyclone Exhaust	0.00	moist. frac.	Assume Scalper exhaust is effectively dry air because no water is used in the process and no water as a combustion byproduct is associated with the scalper operation
Filtration Unit Flow Capacity (Standard Conditions)	**76,328**	dscfm	Design specification for filtration unit
PM/PM10/PM2.5 Emission Factor	**0.0010**	lb/ton	0.001 gr filt. PM/dscf x 76,328 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 /625.1 ton Al/hr) = 0.0010 lb PM/ton Al

15.2.3 VOC Emission Factor for Scalper

Parameter	Value	Basis
Similar Source VOC Emission Factor	0.032 lb/ton	UPL at 95% confidence level from VOC Emission Factors during 3 test runs from the August 2018 Logan Aluminum Scalper 2 compliance test.

15.3 Potential Emission Calculations for Ingot Scalper

> Hourly potential emissions are calculated using the emission factor and maximum hourly aluminum throughput. Annual potential emissions are calculated using the emission factor and maximum annual aluminum throughput (includes voluntary operating constraint on aluminum throughput).

15.3.1 Criteria Pollutant Potential Emission Calculations for Scalper 1

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	**0.0010**	Grain Loading Design Basis	**625.1**	2,118,414	**0.65**	**1.11**
PM10	**0.0010**	Grain Loading Design Basis	**625.1**	2,118,414	**0.65**	**1.11**
PM2.5	**0.0010**	Grain Loading Design Basis	**625.1**	2,118,414	**0.65**	**1.11**
VOC	0.0325	UPL of Similar Src. Test	**625.1**	2,118,414	**20.31**	34.42

15.3.2 HAP Potential Emission Calculations for Scalper 1

Toxic Air Pollutant	Hazardous Air Pollutant? (Y/N)	Worst-case Percentage of Particulate Matter Emissions[1] (wt.%)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Manganese (Mn)	Y	1.40%	**9.16E-03**	**0.016**
Chromium (Cr)	Y	0.35%	**2.29E-03**	**3.88E-03**
Nickel (Ni)	Y	0.20%	**1.31E-03**	**2.22E-03**
Total HAPs (Sum of Mn, Cr, Ni)	Y	1.95%	**0.013**	**0.022**

[1] Novelis has conservatively assumed all PM emitted from Scalper 1 is in the form of aluminum alloy fines as opposed to the other forms of PM that are likely to comprise the PM emissions profile of the ingot scalping process (e.g., dirt, rust, grit, etc.). To determine the worst-case content of each trace metal regulated as a HAP within the aluminum alloys processed by Scalper 1, Novelis compiled specification data for all aluminum alloys planned to be processed by the upstream ingot scalping process supply chips to the scalper. The maximum individual trace metal content for each alloy was compiled into a data table, and the maximum overall content for the specific trace metal was used as a worst-case approximation for the amount of the trace metal that could be found in the PM emissions from the scalper. This selective approach produces a worst-case emissions profile of HAP emissions which could never be achieved in practice on an annual basis because Novelis would never process a single alloy on a continuous basis through the scalper.

16. Scalper Chip Handling System Pneumatic Conveyor w/ Briquetter

> The only regulated air pollutant expected to be emitted by the secondary scalper chip handling system pneumatic conveyor is PM. The only reasonably quantifiable source of PM emissions associated with the scalper chip pneumatic conveyor is the product collection cyclone (inherent process equipment) located **adjacent to the scalper chips bins. The secondary scalper chip handling system pneumatic conveyor production collection cyclone discharges the conveyance air stream into the Ingot Scalper filtration unit.**

Emission Unit ID:	**HR-03-1**
Emission Unit Description:	**Scalper Chip Handling System Pneumatic Conveyor for Briquetter**
~~Emission Unit ID:~~	~~**HR-04-1**~~
~~Emission Unit Description:~~	~~**Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #2 (Flex Line)**~~
~~Emission Unit ID:~~	~~**HR-05-1**~~
~~Emission Unit Description:~~	~~**Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #3 (CBS Line)**~~
~~Emission Unit ID:~~	~~**HR-06-1**~~
~~Emission Unit Description:~~	~~**Scalper Chip Handling System Pneumatic Conveyor- Sidewell Melting Furnace #4 (CBS Line)**~~

16.1 Scalper Chip Handling System Pneumatic Conveyor Process Rates: Metal Throughput

> The maximum hourly and annual aluminum process rates for the scalper chip pneumatic conveyor is based on **the maximum hourly scalper chip generation rate of Scalper #1.**

Parameter	Value		Basis
Maximum Hourly Scalper Chip Generation Rate	13.80	ton/hr	Worst-case scalper chip generation rate based on maximum ingot size
Maximum Annual Scalper Chip Generation Rate	**46,771**	tpy	Ingot Scalper #1 annual process rate limitation multiplied by ratio of maximum hourly scalper chip generation rate to maximum hourly scalper ingot process rate

16.2 Product Collection Cyclone Emission Factor for Scalper Chip Handling System Pneumatic Conveyor

> The pneumatic scalper chip conveying system discharges the scalper chip stream into **a hopper feeding the briquetter**. Potential emissions for filterable PM and condensable PM are estimated using the exit grain loading from recent Method 5/202 engineering testing of the a similar unit (Logan Aluminum's (Logan) Swarf Chip Conveyor (EU 25) process cyclone). **No additional credit for the PM reduction offered by the Ingot Scalper filtration unit is included for conservatism and to allow for direct release of the conveyance air from the secondary scalper chip handling system production collection cyclone, when necessary.**

> Filterable particulate emissions are speciated into filterable PM10 and filterable PM2.5 size fractions based on the particle size distribution data reported in the Swarf Chip Conveyor Cyclone engineering test report. The particle size analysis technique used for the engineering test was a scanning electron microscopic (SEM) analysis of the Method 5 filter and probe rinse performed by MVA Scientific Consultants.

Parameter	Value		Basis
Filt. PM Emission Factor (Grain Loading Basis) for Swarf Chip Conveyor Cyclone	0.015	gr/dscf	July 2016 engineering test for process cyclone serving Swarf Chip Conveyor.
Swarf Chip Cyclone Product Collection Efficiency	97.6%		Particle size distribution-weighted product collection efficiency of existing chip cyclone using collection efficiency performance curve (collection efficiency by weight vs. particle size in microns) and particle size distribution data from Swarf Chip Conveyor engineering test.
Briquetting System Cyclone Product Collection Efficiency	99.4%		Particle size distribution-weighted product collection efficiency of new scalper chip pneumatic conveyor cyclone using collection efficiency performance curve (collection efficiency by weight vs. particle size in microns) and particle size distribution data from Swarf Chip Conveyor engineering test. The inlet particle size distributions for Logan's Swarf Chip Conveyor Cyclone are expected to be representative of the particle size distribution for the proposed scalper chip pneumatic conveyor cyclones given the similarities in the design and operating profile of these units.
Exit Grain Loading Scaling Factor	0.24		(1-99.4% collection efficiency for Briq. Sys. Cyclone)/(1-97.6% collection efficiency for Swarf Chip Cyclone) = 0.24 exit grain loading scaling factor
Filt. PM Emission Factor (Grain Loading Basis) for Pneumatic Conveyor Cyclones	0.004	gr/dscf	0.015 gr/dscf for Swarf Chip Conveyor x 0.24 exit grain loading scaling factor = 0.004 gr/dscf for Pneum. Conv. Cyclone
Filt. PM10/PM2.5 to Filt. PM Ratio	0.18	--	July 2016 SEM particle size distribution analysis of Method 5 filter and probe wash. Conservatively assume all filt. PM10 is filt. PM2.5 because actual PM2.5:PM emissions ratio from SEM analysis produces a filt. PM2.5 grain loading which is not readily measurable via available EPA Reference Test Methods.
Filt. PM10/PM2.5 Emission Factor (Grain Loading Basis)	0.0006	gr/dscf	0.004 gr filt. PM/dscf x 0.18 lb filt. PM10/lb filt. PM = 0.0006 gr PM10/dscf
Condensable Emission Factor (Grain Loading Basis)	0.0012	gr/dscf	July 2016 engineering test for similar process cyclone serving Swarf Chip Conveyor.
Cyclone Flow Capacity	**6,020**	dscfm	Equivalent to **6,020** acfm at near ambient stack temperature with minimal stack moisture.
Maximum Hourly Scalper Chip Process Rate (per Pneumatic Conveyor Cyclone)	**13.80**	ton/hr	Design aluminum processing capacity of pneumatic conveyor cyclone

Parameter	Value		Basis
Filt. PM Emission Factor (Production Basis)	0.014	lb/ton	0.004 gr filt. PM/dscf x 6,020 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 13.8 ton Al/hr = 0.014 lb PM/ton Al
Total PM10 Emission Factor (Production Basis)	0.0069	lb/ton	(0.0006 gr filt. PM/dscf + 0.0012 gr cond. PM/dscf) x 6,020 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 13.8 ton Al/hr = 0.0069 lb PM/ton Al
Total PM2.5 Emission Factor (Production Basis)	0.0069	lb/ton	Conservatively assume total PM10 and total PM2.5 emissions are equivalent.

16.3 Summary of Scalper Chip Handling System Pneumatic Conveyor Potential Emissions

16.3.1 Criteria Pollutant Potential Emissions from Scalper Chip Handling System Pneumatic Conveyor

Pollutant	Stack Emission Factor		Process Rate (ton/hr)	Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.014	lb/ton	13.80	46,771	0.19	0.32
PM10	0.0069	lb/ton	13.80	46,771	0.10	0.16
PM2.5	0.0069	lb/ton	13.80	46,771	0.10	0.16

16.3.2 HAP Potential Emissions from Scalper Chip Handling System Pneumatic Conveyor

Toxic Air Pollutant	Hazardous Air Pollutant? (Y/N)	Worst-case Percentage of Particulate Matter Emissions[1] (wt.%)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Manganese (Mn)	Y	1.40%	2.62E-03	4.43E-03
Chromium (Cr)	Y	0.35%	6.54E-04	1.11E-03
Nickel (Ni)	Y	0.20%	3.74E-04	6.33E-04
Total HAPs (Sum of Mn, Cr, Ni)	Y	1.95%	3.64E-03	6.17E-03

[1] Novelis has conservatively assumed all PM emitted from the pneumatic conveyor system cyclone is in the form of aluminum alloy fines as opposed to the other forms of PM that are likely to comprise the PM emissions profile of the pneumatic conveyor system (e.g., dirt, rust, grit, etc.). To determine the worst-case content of each trace metal regulated as a HAP within the aluminum alloys processed by the pneumatic conveyor cyclone, Novelis compiled specification data for all aluminum alloys planned to be processed by the upstream ingot scalping process supply chips to the pneumatic conveyor. The maximum individual trace metal content for each alloy was compiled into a data table, and the maximum overall content for the specific trace metal was used as a worst-case approximation for the amount of the trace metal that could be found in the PM emissions from the pneumatic conveyor cyclone. This selective approach produces a worst-case emissions profile of HAP emissions which could never be achieved in practice on an annual basis because Novelis would never process a single alloy on a continuous basis through the pneumatic conveyor system.

17. Pusher Furnaces

> Ingots produced in the casting area will be processed by the Pusher Furnaces through a temperature-controlled heating process in order to reheat the ingots for hot rolling or to specifically impart a uniform molecular structure to aluminum ingot prior to hot rolling (a process commonly referred to as homogenization). Heat will be provided by a set of multiple natural gas-fired, low-NOX burners located within multiple temperature-controlled furnace zones. Emissions generated due to natural gas combustion will be collected and ducted out separate, uncontrolled stacks to the atmosphere.

Emission Unit IDs: **HR-07-1 through HR-07-2**
Emission Unit Descriptions: **Pusher Furnace #1**

Emission Unit IDs: **HR-08-1 through HR-08-2**
Emission Unit Descriptions: **Pusher Furnace #2**

Emission Unit IDs: **HR-09-1 through HR-09-2**
Emission Unit Descriptions: **Pusher Furnace #3**

17.1 Pusher Furnace Process Rates: Aluminum Production and Natural Gas Usage

> The maximum hourly emissions from the Pusher Furnaces are a function of the maximum gas usage, which is based on the heat input capacity of its burner and the heating value of the gas consumed at the plant.

Parameter	Value		Basis
Maximum Hourly Aluminum Process Rate	111.5	ton/hr	Maximum aluminum throughput rate for each Pusher based on maximum hourly throughput of Reversing Mill divided equally among three (3) Pusher Furnaces.
Maximum Annual Aluminum Process Rate	688,485	tpy	Proposed annual operating constraint for Reversing Mill ingot process rate divided equally among three (3) Pusher Furnaces.
Heat input capacity of each Pusher Furnace:	104.9	MMBtu/hr	Design specification for Pusher Furnaces
Heating value of natural gas at plant:	1,000	Btu/scf	
Maximum hourly gas usage rate:	0.1049	MMscf/hr	104.9 MMBtu/hr / 1000 Btu/scf
Maximum annual gas usage rate:	427.2	MMscf/yr	Maximum annual natural gas usage at an inherently constrained maximum annual capacity factor of 46.5% from vendor furnace performance design information

17.2 Documentation of Emission Factors Used for Pusher Furnaces

> The potential emission factor derivations for select pollutants generated by the Pusher Furnaces are presented here for reference. All other emission factors are based on reference literature (e.g., EPA's AP-42 and 40 CFR 98).

17.2.1 Emission Factors for Particulate Matter from Similar Source Test Data

Parameter	Value		Basis
Filt. PM/PM10/PM2.5 Emission Factor (Alum. Prod. Basis)	3.46E-03	lb/ton	Emission rate from February 2019 stack test of Logan Pusher Furnace 4.
Total PM10/PM2.5 Emission Factor (Alum. Prod. Basis)	4.31E-03	lb/ton	Emission rate from February 2019 stack test of Logan Pusher Furnace 4.

17.2.2 NOX Emission Factor from Combustion System Design Specification

Parameter	Value		Basis
NOX Exhaust Concentration	100	ppmv	Recuperative burner NOX emissions performance specification for Pusher Furnace combustion system design basis
NO2 Molecular Weight	46	lb/lbmol	Consistent with Method 19, assume all NOX is NO2
Molar Volume Conversion Factor	386	scf/lbmol	Ideal gas law at 68 deg. F and 1 atm
NOX Exhaust Concentration	1.19E-05	lb NOX/dscf	= 120 lbmol NOX/lbmol gas x 46 lb NO2/1 lbmol NO2 x 1 lbmol gas/386 scf gas
F-Factor	8,710	dscf/MMBtu	EPA Method 19 Table 19-2 F-Factor for Various Fuels dry F-factor for natural gas
O2 Concentration for Emission Factor Correction	5	%	O2 reference value for NOX emissions performance specification
NOX Heat Input Rate-Based Emission Factor	0.14	lb/MMBtu	1.19E-05 lb NO2/dscf x 8,710 dscf/MMBtu x 20.9 / (20.9 - 5%) = 0.14 lb NO2 /MMBtu; EPA Method 19 Eq. 19-1
NOX Natural Gas Usage Rate-Based Emission Factor	136.59	lb/MMscf	0.14 lb NO2/MMBtu x 1,000 MMBtu/MMscf = 136.59 lb NO2/MMscf

17.2.3 CO Emission Factor from Combustion System Design Specification

Parameter	Value		Basis
CO Exhaust Concentration	80	ppmv	Recuperative burner CO emissions performance specification for Pusher Furnace combustion system design basis
CO Molecular Weight	28	lb/lbmol	Reference value from Periodic Table
CO Exhaust Concentration	5.81E-06	lb CO/dscf	= 80 lbmol CO/lbmol gas x 28 lb CO/1 lbmol CO x 1 lbmol gas/386 scf gas
O2 Concentration for Emission Factor Correction	5	%	O2 reference value for CO emissions performance specification
CO Heat Input Rate-Based Emission Factor	0.067	lb/MMBtu	5.81E-06 lb CO/dscf x 8,710 dscf/MMBtu x 20.9 / (20.9 - 5%) = 0.067 lb CO/MMBtu; EPA Method 19 Eq. 19-1
CO Natural Gas Usage Rate-Based Emission Factor	66.51	lb/MMscf	0.067 lb CO/MMBtu x 1,000 MMBtu/MMscf = 66.51 lb CO/MMscf

17.2.4 Emission Factors for Natural Gas Combustion

Parameter	Value	Basis
VOC Emission Factor	4.22 lb/MMscf	Emission rate from February 2019 stack test of Logan Pusher Furnace 4 maximum of can body and can end averages.

17.3 Potential Emission Calculations for Pusher Furnaces

> Hourly potential emissions are calculated using the emission factor and maximum hourly gas usage. Annual potential emissions are calculated using the emission factor and maximum annual gas usage (includes voluntary operating constraint on gas usage).

17.3.1 Potential Emissions from Aluminum Production

Pollutant	Emission Factor		Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate per Furnace (lb/hr)	(tpy)	Total Potential Emissions (tpy)
PM	3.46E-03	lb/ton	Logan Stack Test Feb. 2019	111.55	688,485	0.39	1.19	3.57
PM10	4.31E-03	lb/ton	Logan Stack Test Feb. 2019	111.55	688,485	0.48	1.48	4.45
PM2.5	4.31E-03	lb/ton	Logan Stack Test Feb. 2019	111.55	688,485	0.48	1.48	4.45

17.3.2 Potential Emissions from Natural Gas Combustion

Pollutant	Emission Factor		Emission Factor Basis	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate per Furnace (lb/hr)	(tpy)	Total Potential Emissions (tpy)
NOX	136.6	lb/MMscf	Comb. System Design Spec.	0.105	427.2	14.33	29.18	87.53
CO	66.5	lb/MMscf	Comb. System Design Spec.	0.105	427.2	6.98	14.21	42.62
VOC	4.2	lb/MMscf	Logan Stack Test Feb. 2019	0.105	427.2	0.44	0.90	2.70
SO2	0.6	lb/MMscf	AP-42, Chp.1.4, Tbl 1.4-2	0.105	427.2	0.063	0.13	0.38
CO2	116,977	lb/MMscf	40CFR98 Subpart C, Table C-1	0.105	427.2	12,271	24,986	74,959
CH4	2.2	lb/MMscf	40CFR98 Subpart C, Table C-2	0.105	427.2	0.23	0.47	1.41
N2O	0.22	lb/MMscf	40CFR98 Subpart C, Table C-2	0.105	427.2	0.023	0.047	0.141
CO2e	**117,097**	lb/MMscf	40CFR98 Subpart A	0.105	427.2	**12,284**	**25,012**	**75,036**
Lead	5.00E-04	lb/MMscf	AP-42 Table 1.4-4.	0.105	427.2	5.25E-05	1.07E-04	3.20E-04
Total HAPs	1.89	lb/MMscf	AP-42 Tables 1.4-3 & 1.4-4.	0.105	427.2	0.20	0.40	1.21

18. Hot Reversing Mill

> The Hot Rolling Mill will include one (1) single-stand reversing Roughing Mill [Hot Reversing Mill (HRM)] and one (1) four (4)-stand Finishing Mill [Hot Finishing Mill (HFM)], along with roller tables, a vertical edger, shears, and coilers. After passing through a vertical edger, the ingot will proceed via the roll table to the single-stand reversing HRM. The mill's reversing capabilities will allow the aluminum slab to pass back and forth through the HRM (edger and main mill stand). The roller spacing will be adjusted with each pass, such that each subsequent pass through the rollers further reduces the slab's thickness. Due to the significant amount of heat that will be formed by the pressure applied to the work rolls in the HRM, a water/oil emulsion will be used as a coolant for the work rolls while they are in operation. The coolant will also double as a lubricant to prevent aluminum from sticking to the steel work rolls. Various spray headers above and below the roll table will be used to cool and lubricate the rollers, edger, and shears. Furthermore, a kerosene-based (or similar light hydrotreated petroleum distillate) will be sprayed as a "bite aid" to facilitate the work rolls biting onto the ingot and threading process at the mill stand.

> Entrained mist and vapor from roll coolant will be captured through the mill's hooding system and will be routed to a mist eliminator designed for PM control. Exhaust will be routed to a single stack.

Emission Unit ID: **HR-10-1**
Emission Unit Description: **Hot Reversing Mill**

Emission Unit ID: **HR-10-2**
Emission Unit Description: **Hot Reversing Mill Fugitives**

18.1 Hot Reversing Mill Process Rates

18.1.1 Hot Reversing Mill Metal Processing Capacity

> The maximum hourly aluminum process rate of the Roughing Mill is based on the maximum ingot size and minimum ingot pass time. Ingot pass time depends on product mix and product size.

Short-term aluminum throughput :	334.6 ton/hr	Maximum hourly ingot input process rate to Hot Reversing Mill from production modeling used to support the engineering design basis for the hot mill
Maximum annual aluminum throughput:	2,065,454 tpy	Proposed operating constraint; Derived from product mix-weighted avg. (long-term avg.) HRM process rate (277.4 ton/hr) multiplied by an maximum achievable 85% capacity factor (85% x 8,760 hr/yr).

18.2 PM and VOC Emission Factors for Hot Reversing Mill

> Hot Mills are a source of PM and VOC emissions due to roll coolant droplet entrainment and evaporative losses and bite aid application evaporative losses. A hooding system will capture and direct a portion of the roll coolant mist and vapor emissions to the mist eliminator for PM control and then out a dedicated stack. Uncaptured emissions are released into the Hot Rolling Area building space.

18.2.1 Filterable PM Emission Factors

Parameter	Value		Basis
Stack Emissions from Mist Eliminator			
Filt. PM Outlet Concentration for Mist Eliminator	0.0020	gr/dscf	PM emissions performance specification of mist eliminator system
Design Exhaust Flow of Mist Eliminator #1 (Actual Conditions)	**217,500**	acfm	Nominal fume exhaust system flow capacity from vendor fume exhaust system design.
Nominal Temperature of Mist Eliminator #1 Exhaust Flow	**130.0**	deg. F	**Nominal fume exhaust system temperature from vendor fume exhaust system design.**
Nominal Moisture Content of Mist Eliminator #1 Exhaust Flow	0.041	moist. frac.	Similar source stack test (Logan's October 2021 RM performance test report)
Design Exhaust Flow of Mist Eliminator #1	**186,651**	dscfm	217,500 acfm x (460 + 68 deg. F)/(460 + 130 deg. F) x (1 - 0.041 moist. frac.) = 186,651 dscfm
Filt. PM Stack Emission Factor	**0.0096**	lb/ton	= 0.0020 gr filt. PM/dscf x 186,651 dscfm x 60 min/hr x 1 lb/7,000 gr / 334.6 ton/hr

Parameter	Value		Basis
Uncaptured Emissions			
Filt. PM Emission Control Efficiency of Reversing Mill Fume Exhaust System	58%		Logan Reversing Mill 10/2021 Performance Test
Capture Efficiency of Reversing Mill Fume Exhaust System	90%		Reversing Mill fume exhaust system design specification
Filt. PM Emissions Generated	**0.025**	lb/ton	0.0096 lb filt. PM/ton / (100% -58.0% cont. eff.) / 90.0% capt. eff. = 0.025 lb filt. PM/ton
Uncapt. Filt. PM Released into Mill Building	**0.00253**	lb/ton	0.025 lb filt. PM/ton x (100% - 90% Capt. Eff.) = 0.003 lb filt. PM/ton
Mill Building PM/PM10/PM2.5 Removal Efficiency	90%		Using the control credit for "enclosed by building" from TCEQ's Technical Guidance for Rock Crushing Plants (RG 058, Feb. 2022) as a guide, assume building removal efficiency is 90% for PM based on high air inflow rate to building for supplying control devices and large distances between uncaptured emissions sources and building openings.
Uncaptured Filt. PM Emission Factor	**0.000253**	lb/ton	0.00253 lb filt. PM/ton x (1 - 90.0% building PM/PM10/PM2.5 removal eff.) = 0.000253 lb filt. PM/ton

18.2.2 PM10 Emission Factors

> The filterable PM10 stack and uncaptured emission factors are derived using the same approach applied for the filterable PM emission factors. Particle size data from the October 2021 Logan Reversing Mill stack test is used to speciate stack, filterable PM into the fraction greater than PM10 and the fraction less than PM10.

Parameter	Value		Basis
Stack Emissions from Mist Eliminator			
Stack Cond. PM Emission Factor	0.0126	lb/ton	UPL at 90% confidence level from four (4) test runs of condensable PM emission factor measured during Oct. 2021 Compliance Test on Logan Reversing Mill adjusted to account for difference in fume exhaust system capture efficiency for Logan's Reversing Mill versus Novelis' proposed HRM.
Cond. PM Emissions Generated	0.0140	lb/ton	0.0126 lb cond. PM/ton / 90.0% capt. eff. = 0.0140 lb cond. PM/ton
Ratio of Filt. PM>10 to Filt. PM	0.112		Particle size distribution at Reversing Mill stack measured during Oct. 2021 Compliance Test on Logan Reversing Mill.
Ratio of Filt. PM2.5-10 to Filt. PM	0.178		
Ratio of Filt. PM2.5 to Filt. PM	0.710		
Filt. PM10 to Filt. PM Emissions Ratio for Stack Emissions	0.888		Particle size distribution at Reversing Mill stack measured during Oct. 2021 Compliance Test on Logan Reversing Mill.
Filt. PM10 Stack Emission Factor	**0.0085**	lb/ton	0.010 lb filt. PM10/ton x 0.888 lb filt. PM10/lb filt. PM = 0.0085 lb filt. PM10/ton
Stack Total PM10 Stack Emission Factor	**0.021**	lb/ton	0.008 lb filt. PM10/ton + 0.0126 lb cond. PM/ton = 0.021 lb tot. PM10/ton

Parameter	Value		Basis
Uncaptured Emissions			
Filt. PM10 Emissions Control Efficiency of Mist Eliminator	59.49%		Logan Reversing Mill 10/2021 Performance Test
Filt. PM10 Emissions Generated	**0.023**	lb/ton	0.0085 lb filt. PM10/ton / (100% -59.5% cont. eff.) / 90.0% capt. eff. = 0.023 lb filt. PM10/ton
Uncapt. Filt. PM10 Released into Mill Building	**0.00233**	lb/ton	0.023 lb filt. PM10/ton x (100% - 90% Capt. Eff.) = 0.002 lb filt. PM10/ton
Uncapt. Cond. PM Released into Mill Building	**0.00140**	lb/ton	0.0140 lb cond. PM/ton x (100% - 90% capt. eff.) = 0.0014 lb cond. PM/ton
Mill Building PM/PM10/PM2.5 Removal Efficiency	90%		Refer to previous PM/PM10/PM2.5 building removal efficiency basis in Section 18.2.1.
Uncaptured Total PM10 Emission Factor	**0.00037**	lb/ton	(0.00233 lb filt. PM10/ton + 0.00140 lb cond. PM/ton) x (100% - 90.0% building PM/PM10/PM2.5 removal eff.) = 0.00037 lb total PM10/ton

18.2.3 PM2.5 Emission Factors

Other than particle size data, no additional input data or assumptions are required specifically for PM2.5 emissions estimates beyond the resources previously presented for the derivation of the filt. PM and PM10 emission factors.

Parameter	Value		Basis
Stack Emissions from Mist Eliminator			
Filt. PM2.5 to Filt. PM Emissions Ratio	0.71		Particle size distribution at Reversing Mill stack measured during Oct. 2021 Compliance Test on Logan Reversing Mill.
Stack Filt. PM2.5 Emission Factor	**0.0068**	lb/ton	0.0096 lb filt. PM/ton x 0.71 lb filt. PM2.5/lb filt. PM = 0.0068 lb filt. PM2.5/ton
Stack Total PM2.5 Emission Factor	**0.019**	lb/ton	0.0068 lb filt. PM2.5/ton + 0.0126 lb cond. PM/ton = 0.019 lb tot. PM2.5/ton

Parameter	Value		Basis
Uncaptured Emissions			
Filt. PM2.5 Emissions Control Efficiency of Mist Eliminator	55.48%		Logan Reversing Mill 10/2021 Performance Test
Filt. PM2.5 Emissions Generated	**0.017**	lb/ton	0.0068 lb filt. PM2.5/ton / (100% -55.5% cont. eff.) / 90.0% capt. eff. = 0.017 lb filt. PM2.5/ton
Uncapt. Filt. PM2.5 Released into Mill Building	**0.00169**	lb/ton	0.017 lb filt. PM2.5/ton x (100% - 90% capt. eff.) = 0.00169 lb filt. PM2.5/ton
Mill Building PM/PM10/PM2.5 Removal Efficiency	90%		Refer to previous PM/PM10/PM2.5 building removal efficiency basis in Section 18.2.1.
Uncaptured Total PM2.5 Emission Factor	**0.00031**	lb/ton	(0.00169 lb filt. PM2.5/ton + 0.00140 lb cond. PM/ton) x (100% - 90.0% building PM/PM10/PM2.5 removal eff.) = 0.00031 lb total PM2.5/ton

18.2.4 VOC Emission Factors

The VOC emission factor from the coolant contribution is obtained from the results of the same Logan Reversing Mill October 2021 stack test used as the basis for the stack and uncaptured PM/PM10/PM2.5 emission factors. Bite aid VOC emissions are added in separately assuming 100% loss. As a very small fraction of the ingots processed will require bite aid for resolving bite refusals, separate short and long term emission factors are established for the Hot Reversing Mill VOC emissions.

Parameter	Value		Basis
Stack Emissions from Mist Eliminator - Coolant Contribution			
VOC Stack Emission Factor Basis	0.035	lb/ton	UPL at 90% confidence level from four (4) test runs of VOC emission factor measured during Oct. 2021 Compliance Test on Logan Reversing Mill adjusted to account for difference in fume exhaust system capture efficiency for Logan's Reversing Mill versus Novelis' proposed HRM.
Short Term Emission Rate - Stack Emissions from Mist Eliminator - Bite Aid + Coolant Contribution			
Bite Aid Application Rate - Volume Basis	27.83	l/hr	Proposed Reversing Mill design basis
Bite Aid Density	0.84	kg/l	Representative kerosene density from TankESP default stock of "Jet Kerosene"
Bite Aid Application Rate - Mass Basis	51.46	lb/hr	27.8 l/hr x 0.84 kg/l x 2.20462 lb/kg = 51.46 lb/hr
VOC Generated Emission Factor - Bite Aid	51.46	lb/hr	Conservatively assumes 100% loss to the atmosphere
VOC Exhaust Emission Factor - Bite Aid	46.32	lb/hr	51.46 lb VOC/hr x 90% capt. eff. = 46.32 lb VOC/hr
Short Term VOC Exhaust Emission Factor	0.173	lb/ton	0.035 lb VOC/ton from coolant application + 46.32 lb VOC/hr from bite aid application / 334.6 ton/hr = 0.173 lb VOC/ton
Long Term Emission Rate - Stack Emissions from Mist Eliminator - Bite Aid + Coolant Contribution			
Bite Aid Application Rate	4,800	l/yr	Based on the expected frequency of bite refusals requiring bite aid application
Bite Aid Application Rate	8,876	lb/yr	4,800 l/yr x 0.84 kg/l x 2.20462 lb/kg = 8,876 lb/yr
VOC Generated Emission Factor - Bite Aid	8,876	lb/yr	Conservatively assumes 100% loss to the atmosphere
VOC Exhaust Emission Factor - Bite Aid	3.99	tpy	8,876 lb VOC/yr x 90% capt. eff. / 2,000 lb/ton = 3.99 tpy VOC
Annual VOC Exhaust Emission Factor	40.0	tpy	(0.035 lb VOC/ton from coolant application x 2,065,454 ton Al/yr / 2,000 lb/ton) + 3.99 ton VOC/yr from bite aid application = 40.0 tpy VOC
Annual VOC Exhaust Emission Factor	0.039	lb/ton	40.0 ton VOC/yr x 2,000 lb/ton / 2,065,454 tpy = 0.039 lb VOC/ton

Parameter	Value		Basis
Uncaptured Emissions - Coolant Contribution			
VOC Emissions Generated	0.039	lb/ton	0.0348 lb VOC/ton / 90% Capt. Eff. = 0.0387 lb VOC/ton
Uncaptured VOC Emission Factor	0.0039	lb/ton	0.0387 lb VOC/ton x (100% - 90% Capt. Eff.) = 0.00387 lb VOC/ton
Short Term Emission Rate - Uncaptured Emissions - Bite Aid + Coolant Contribution			
VOC Uncapt. Emission Factor - Bite Aid	5.15	lb/hr	51.46 lb VOC/hr generated - 46.32 lb VOC/hr captured = 5.15 lb VOC/hr
Short Term VOC Uncapt. Emission Factor	0.0192	lb/ton	0.00387 lb VOC/ton from coolant application + 5.15 lb VOC/hr from bite Aid application / 334.6 ton/hr = 0.0192 lb VOC/ton
Long Term Emission Rate - Uncaptured Emissions - Bite Aid + Coolant Contribution			
VOC Uncapt. Emission Factor - Bite Aid	0.44	tpy	(8,876 lb VOC/yr generated / 2,000 lb/ton) - 3.99 ton VOC/yr captured = 0.44 tpy VOC
VOC Uncapt. Emission Factor	4.44	tpy	(0.00387 lb VOC/ton from coolant application x 2,065,454 ton Al/yr / 2,000 lb/ton) + 0.444 ton VOC/yr from bite aid application = 4.44 tpy VOC
Annual VOC Uncapt. Emission Factor	0.0043	lb/ton	4.44 ton VOC/yr x 2,000 lb/ton / 2,065,454 tpy = 0.0043 lb VOC/ton

18.3 Summary of Reversing Mill Potential Emissions

> Hourly potential emissions are calculated using the appropriate emission factor (i.e., short term emission factors for VOC emissions) and maximum hourly aluminum throughput. Annual potential emissions are calculated using the appropriate emission factor (i.e., long term emission factors for VOC emissions) and maximum annual aluminum throughput (includes voluntary operating constraint on aluminum throughput).

Pollutant	Emission Factor		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Stack Emissions from Mist Eliminator						
PM	**0.0096**	lb/ton	334.6	2,065,454	**3.20**	**9.87**
PM10	**0.021**	lb/ton	334.6	2,065,454	**7.07**	**21.82**
PM2.5	**0.019**	lb/ton	334.6	2,065,454	**6.50**	**20.06**
PMcon	0.0126	lb/ton	334.6	2,065,454	4.23	13.05
VOC (Short Term)	0.173	lb/ton	334.6	2,065,454	57.97	--
VOC (Long Term)	0.039	lb/ton	334.6	2,065,454	--	39.96
Uncaptured Emissions						
PM	**0.00025**	lb/ton	334.6	2,065,454	**0.08**	**0.26**
PM10	**0.00037**	lb/ton	334.6	2,065,454	**0.12**	**0.39**
PM2.5	**0.00031**	lb/ton	334.6	2,065,454	**0.10**	**0.32**
VOC (Short Term)	0.0192	lb/ton	334.6	2,065,454	6.44	--
VOC (Long Term)	0.0043	lb/ton	334.6	2,065,454	--	4.44
Total (Stack + Uncaptured) Emissions						
PM					**3.28**	**10.14**
PM10					**7.19**	**22.20**
PM2.5					**6.60**	**20.38**
VOC (Short Term)					64.41	--
VOC (Long Term)					--	44.40

19. Finishing Mill

> After the slab reaches roughly the desired thickness in the Reversing Mill, it will be moved to the 4-stand Finishing Mill for final gauge reduction and conversion to a raw gauge hot rolled coil. Due to the significant amount of heat that will be formed by the pressure applied to the work rolls in the HRM, a water/oil emulsion will be used as a coolant for the work rolls while they are in operation. The coolant will also double as a lubricant to prevent aluminum from sticking to the steel work rolls. Various spray headers above and below the roll table will be used to cool and lubricate the rollers and shears. Furthermore, a kerosene-based (or similar light hydrotreated petroleum distillate) will be sprayed as a "bite aid" to facilitate the work rolls biting onto the slab and threading process at the mill stand. After the slab exits the final mill stand, the aluminum strip will collect on the exit coiler. The resulting coil will then be removed and transported to the Cold Rolling area for further processing.

> Entrained mist and vapor from roll coolant and bite lube will be captured through the mill's hooding system and will be routed to a mist eliminator designed for PM control. Exhaust will be routed to a single stack.

Emission Unit ID: **HR-11-1**
Emission Unit Description: **Hot Finishing Mill**

Emission Unit ID: **HR-11-2**
Emission Unit Description: **Hot Finishing Mill Fugitives**

19.1 Hot Finishing Mill Process Rates

19.1.1 Hot Finishing Mill Metal Processing Capacity

> The maximum hourly aluminum process rate of the Finishing Mill is based on the maximum ingot size and minimum ingot pass time. Ingot pass time depends on product mix and product size.

Short-term aluminum throughput :	318.9 ton/hr	Maximum hourly ingot input process rate to Hot Finishing Mill from production modeling used to support the engineering design basis for the hot mill
Maximum annual aluminum throughput:	1,968,377 tpy	Proposed operating constraint; Derived from product mix-weighted avg. (long-term avg.) HFM process rate (264.4 ton/hr) multiplied by an maximum achievable 85% capacity factor (85% x 8,760 hr/yr).

19.2 PM and VOC Emission Factors for Hot Finishing Mill

> Hot Mills are a source of PM and VOC emissions due to roll coolant droplet entrainment and evaporative losses and bite aid application evaporative losses. A hooding system will capture and direct a portion of the roll coolant mist and vapor emissions to the mist eliminator for PM control and then out a dedicated stack. Uncaptured emissions are released into the Hot Rolling Area building space.

19.2.1 Filterable PM Emission Factors

Parameter	Value		Basis
Stack Emissions from Mist Eliminator			
Filt. PM Outlet Concentration for Mist Eliminator	0.0020	gr/dscf	PM emissions performance specification of mist eliminator system
Design Exhaust Flow of Mist Eliminator #2 (Actual Conditions)	435,000	acfm	Nominal fume exhaust system flow capacity from vendor fume exhaust system design.
Nominal Temperature of Mist Eliminator #2 Exhaust Flow	**130.0**	deg. F	**Nominal fume exhaust system temperature from vendor fume exhaust system design.**
Nominal Moisture Content of Mist Eliminator #2 Exhaust Flow	0.040	moist. frac.	Similar source design basis (Logan FM exhaust temp. from Nov. 2021 Hot Mill Upgrade Title V significant revision application).
Annual Average Barometric Pressure	29.68	in. Hg	AP-42 Chapter 7, Table 7.1-7, Meteorological Data for Selected US Locations, Mobile, AL; Converted from psia to in. Hg
Design Exhaust Flow of Mist Eliminator #2	**370,755**	dscfm	17.636 x 435,000 acfm x (1 - 0.040 moist. frac.) x 29.68 in. Hg barometric press./(459.67 + 130 deg. F) = 370,755 dscfm; See sample equation from Logan FM test report
Filt. PM Stack Emission Factor	**0.0199**	lb/ton	= 0.0020 gr filt. PM/dscf x 370,755 dscfm x 60 min/hr x 1 lb/7,000 gr / 318.9 ton/hr

Average Stack Gas Flow at Standard Conditions (Qs), dscfm

$$Qs = 17.636 \times Qa \times (1 - BWS) \times \frac{Ps}{Ts}$$

Parameter	Value		Basis
Uncaptured Emissions			
Filt. PM Emission Control Efficiency of Finishing Mill Fume Exhaust System	64%		Logan Finishing Mill 12/2021 Performance Test
Capture Efficiency of Finishing Mill Fume Exhaust System	95%		Logan Finishing Mill 12/2021 Performance Test
Filt. PM Emissions Generated	**0.058**	lb/ton	0.0199 lb filt. PM/ton / (100% -63.7% cont. eff.) / 95.0% capt. eff. = 0.058 lb filt. PM/ton
Fug. Filt. PM Released into Mill Building	**0.00289**	lb/ton	0.058 lb filt. PM/ton x (100% - 95% Capt. Eff.) = 0.003 lb filt. PM/ton
Mill Building PM/PM10/PM2.5 Removal Efficiency	90%		Using the control credit for "enclosed by building" from TCEQ's Technical Guidance for Rock Crushing Plants (RG 058, Feb. 2022) as a guide, assume building removal efficiency is 90% for PM based on high air inflow rate to building for supplying control devices and large distances between uncaptured emissions sources and building openings.
Uncaptured Filt. PM Emission Factor	**0.00029**	lb/ton	0.00289 lb filt. PM/ton x (1 - 90.0% building PM/PM10/PM2.5 removal eff.) = 0.00029 lb filt. PM/ton

19.2.2 PM10 Emission Factors

> The filterable PM10 stack and uncaptured emission factors are derived using the same approach applied for the filterable PM emissio factors. Particle size data from the December 2021 Logan Finishing Mill stack test is used to speciate stack, filterable PM into the frac greater than PM10 and the fraction less than PM10.

Parameter	Value		Basis
Stack Emissions from Mist Eliminator			
Stack Cond. PM Emission Factor	0.028	lb/ton	UPL at 90% confidence level of condensable PM emission rate measured during Dec. 2021 Compliance Test on Logan Finishing Mill and July 2021 Compliance Test on Novelis Oswego Finishing Mill.
Cond. PM Emissions Generated	0.029	lb/ton	0.0279 lb cond. PM/ton / 95.0% capt. eff. = 0.0294 lb cond. PM/ton
Ratio of Filt. PM>10 to Filt. PM	0.130		Particle size distribution at Finishing Mill stack measured during Dec. 2021 Compliance Test on Logan Finishing Mill.
Ratio of Filt. PM2.5-10 to Filt. PM	0.221		
Ratio of Filt. PM2.5 to Filt. PM	0.649		
Filt. PM10 to Filt. PM Emissions Ratio for Stack Emissions	0.87		Particle size distribution at Finishing Mill stack measured during Dec. 2021 Compliance Test on Logan Finishing Mill.
Filt. PM10 Stack Emission Factor	**0.0173**	lb/ton	0.020 lb filt. PM10/ton x 0.870 lb filt. PM10/lb filt. PM = 0.0173 lb filt. PM10/ton
Stack Total PM10 Stack Emission Factor	**0.045**	lb/ton	0.0173 lb filt. PM10/ton + 0.0279 lb cond. PM/ton = 0.045 lb tot. PM10/ton
Uncaptured Emissions			
Filt. PM10 Emissions Control Efficiency of Mist Eliminator	64.58%		Logan Finishing Mill 12/2021 Performance Test
Filt. PM10 Emissions Generated	**0.052**	lb/ton	0.0173 lb filt. PM10/ton / (100% -64.6% cont. eff.) / 95.0% capt. eff. = 0.052 lb filt. PM10/ton
Uncapt. Filt. PM10 Released into Mill Building	**0.0026**	lb/ton	0.052 lb filt. PM10/ton x (100% - 95% Capt. Eff.) = 0.003 lb filt. PM10/ton
Uncapt. Cond. PM Released into Mill Building	**0.0015**	lb/ton	0.0294 lb cond. PM/ton x (100% - 95% capt. eff.) = 0.0015 lb cond. PM/ton
Mill Building PM/PM10/PM2.5 Removal Efficiency	90%		Refer to previous PM/PM10/PM2.5 building removal efficiency basis in Section 19.2.1.
Uncaptured Total PM10 Emission Factor	**0.00040**	lb/ton	(0.00258 lb filt. PM10/ton + 0.00147 lb cond. PM/ton) x (100% - 90.0% building PM/PM10/PM2.5 removal eff.) = 0.00040 lb total PM10/ton

19.2.3 PM2.5 Emission Factors

Other than particle size data, no additional input data or assumptions are required specifically for PM2.5 emissions estimates beyond the resources previously presented for the derivation of the filt. PM and PM10 emission factors.

Parameter	Value		Basis
Stack Emissions from Mist Eliminator			
Filt. PM2.5 to Filt. PM Emissions Ratio	0.65		Particle size distribution at Finishing Mill stack measured during Dec. 2021 Compliance Test on Logan Finishing Mill.
Stack Filt. PM2.5 Emission Factor	**0.0129**	lb/ton	0.0199 lb filt. PM/ton x 0.65 lb filt. PM2.5/lb filt. PM = 0.0129 lb filt. PM2.5/ton
Stack Total PM2.5 Emission Factor	**0.041**	lb/ton	0.0129 lb filt. PM2.5/ton + 0.0279 lb cond. PM/ton = 0.041 lb tot. PM2.5/ton
Uncaptured Emissions			
Filt. PM2.5 Emissions Control Efficiency of Mist Eliminator	66.96%		Logan Finishing Mill 12/2021 Performance Test
Filt. PM2.5 Emissions Generated	**0.041**	lb/ton	0.0129 lb filt. PM2.5/ton / (100% -67.0% cont. eff.) / 95.0% capt. eff. = 0.041 lb filt. PM2.5/ton
Uncapt. Filt. PM2.5 Released into Mill Building	**0.00206**	lb/ton	0.041 lb filt. PM2.5/ton x (100% - 95% capt. eff.) = 0.00206 lb filt. PM2.5/ton
Mill Building PM/PM10/PM2.5 Removal Efficiency	90%		Refer to previous PM/PM10/PM2.5 building removal efficiency basis in Section 19.2.1.
Uncaptured Total PM2.5 Emission Factor	**0.00035**	lb/ton	(0.00206 lb filt. PM2.5/ton + 0.00147 lb cond. PM/ton) x (100% - 90.0% building PM/PM10/PM2.5 removal eff.) = 0.00035 lb total PM2.5/ton

19.2.4 VOC Emission Factors

The VOC emission factor from the coolant contribution is obtained from the results of the Logan Reversing Mill October 2021 stack test scaled to account for the higher capture efficiency and number of mill stands for the proposed Finishing Mill. The Logan Finishing Mill VOC emissions data from the December 2021 performance test is not representative of the proposed Finishing Mill because the level of bite aid usage is known to be different for Logan's Finishing Mill than is planned for the proposed Finishing Mill. Bite aid VOC emissions are added in separately assuming 100% loss. As a very small fraction of the ingots processed will require bite aid for resolving bite refusals, separate short and long term emission factors are established for the Hot Reversing Mill VOC emissions.

Parameter	Value		Basis
Stack Emissions from Mist Eliminator - Coolant Contribution			
VOC Stack Emission Factor Basis	0.147	lb/ton	UPL at 90% confidence level from four (4) test runs of VOC emission factor measured during Oct. 2021 Compliance Test on Logan Reversing Mill, normalized based on 52% capture efficiency at Logan to calculate VOC emissions generated and multiplied by 95% capture efficiency for the proposed Finishing Mill covered by this project. An additional 4X scaling factor is added to account for the four (4) stands at the Finishing Mill vs. one (1) stand at Logan's Reversing Mill.
Short Term Emission Rate - Stack Emissions from Mist Eliminator - Bite Aid + Coolant Contribution			
Bite Aid Application Rate - Volume Basis	26.0	l/hr	Proposed Finishing Mill design basis
Bite Aid Density	0.84	kg/l	Representative kerosene density from TankESP default stock of "Jet Kerosene"
Bite Aid Application Rate - Mass Basis	48.08	lb/hr	26.0 l/hr x 0.84 kg/l x 2.20462 lb/kg = 48.08 lb/hr
VOC Generated Emission Factor - Bite Aid	48.08	lb/hr	Conservatively assumes 100% loss to the atmosphere
VOC Exhaust Emission Factor - Bite Aid	45.68	lb/hr	48.08 lb VOC/hr x 95% capt. eff. = 45.68 lb VOC/hr
Short Term VOC Exhaust Emission Factor	0.290	lb/ton	0.147 lb VOC/ton from coolant application + 45.68 lb VOC/hr from bite aid application / 318.9 ton/hr = 0.290 lb VOC/ton

Long Term Emission Rate - Stack Emissions from Mist Eliminator - Bite Aid + Coolant Contribution

Bite Aid Application Rate	16,800	l/yr	Based on the expected frequency of bite refusals requiring bite aid application
Bite Aid Application Rate	31,067	lb/yr	16,800 l/yr x 0.84 kg/l x 2.20462 lb/kg = 31,067 lb/yr
VOC Generated Emission Factor - Bite Aid	31,067	lb/yr	Conservatively assumes 100% loss to the atmosphere
VOC Exhaust Emission Factor - Bite Aid	14.76	tpy	31,067 lb VOC/yr x 95% capt. eff. / 2,000 lb/ton = 14.76 tpy VOC
Annual VOC Exhaust Emission Factor	159.5	tpy	(0.147 lb VOC/ton from coolant application x 1,968,377 ton Al/yr / 2,000 lb/ton) + 14.76 ton VOC/yr from bite Aid application = 159.5 tpy VOC
Annual VOC Exhaust Emission Factor	0.162	lb/ton	159.5 ton VOC/yr x 2,000 lb/ton / 1,968,377 tpy = 0.162 lb VOC/ton

Parameter	Value		Basis
Uncaptured Emissions - Coolant Contribution			
VOC Emissions Generated	0.155	lb/ton	0.147 lb VOC/ton / 95% Capt. Eff. = 0.1548 lb VOC/ton
Uncaptured VOC Emission Factor	0.0077	lb/ton	0.155 lb VOC/ton x (100% - 95% Capt. Eff.) = 0.0077 lb VOC/ton

Short Term Emission Rate - Uncaptured Emissions - Bite Aid + Coolant Contribution

VOC Uncapt. Emission Factor - Bite Aid	2.40	lb/hr	48.08 lb VOC/hr generated - 45.68 lb VOC/hr captured = 2.40 lb VOC/hr
Short Term VOC Uncapt. Emission Factor	0.0153	lb/ton	0.00774 lb VOC/ton from coolant application + 2.40 lb VOC/hr from bite aid application / 318.9 ton/hr = 0.0153 lb VOC/ton

Long Term Emission Rate - Uncaptured Emissions - Bite Aid + Coolant Contribution

VOC Uncapt. Emission Factor - Bite Aid	0.78	tpy	(31,067 lb VOC/yr generated / 2,000 lb/ton) - 14.76 ton VOC/yr captured = 0.78 tpy VOC
VOC Uncapt. Emission Factor	8.39	tpy	(0.00774 lb VOC/ton from coolant application x 1,968,377 ton Al/yr / 2,000 lb/ton) + 0.78 ton VOC/yr from bite Aid application = 8.39 tpy VOC
Annual VOC Uncapt. Emission Factor	0.0085	lb/ton	8.39 ton VOC/yr x 2,000 lb/ton / 1,968,377 tpy = 0.0085 lb VOC/ton

19.3 Summary of Finishing Mill Potential Emissions

> Hourly potential emissions are calculated using the emission factor and maximum hourly aluminum throughput. Annual potential emissions are calculated using the emission factor and maximum annual aluminum throughput (includes voluntary operating constraint on aluminum throughput).

Pollutant	Emission Factor		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Stack Emissions from Mist Eliminator						
PM	**0.020**	lb/ton	318.9	1,968,377	**6.36**	**19.61**
PM10	**0.045**	lb/ton	318.9	1,968,377	**14.44**	**44.55**
PM2.5	**0.041**	lb/ton	318.9	1,968,377	**13.03**	**40.22**
PMcon	0.028	lb/ton	318.9	1,968,377	8.91	27.48
VOC (Short Term)	0.290	lb/ton	318.9	--	92.57	--
VOC (Long Term)	0.162	lb/ton	--	1,968,377	--	159.48
Uncaptured Emissions						
PM	**0.00029**	lb/ton	318.9	1,968,377	**0.09**	**0.28**
PM10	**0.00040**	lb/ton	318.9	1,968,377	**0.13**	**0.40**
PM2.5	**0.00035**	lb/ton	318.9	1,968,377	**0.11**	**0.35**
VOC (Short Term)	0.0153	lb/ton	318.9	-	4.87	-
VOC (Long Term)	0.0085	lb/ton	-	1,968,377	-	8.39
Total (Stack + Uncaptured) Emissions						
PM					**6.45**	**19.90**
PM10					**14.57**	**44.95**
PM2.5					**13.15**	**40.57**
VOC (Short Term)					97.44	--
VOC (Long Term)					--	167.87

20. Tandem Cold Mill

One (1) 4-high Tandem (2-stand) Cold Rolling Mill (TCM) will provide cold rolling capability. The overall mill assembly is designed to produce coils with accurate dimensions (both thickness and width), appropriate flatness, and freedom from surface defects. A water/oil emulsion-based coolant and base rolling oil are applied at controlled flow rates to the aluminum strip/work roll interfaces. The water/oil emulsion is also applied to the bottom of the strip between stands 1 and 2. Although this coolant and rolling oil application process serves several functions, its primary function is to remove heat generated from the compression of the aluminum strip and to prevent sticking of the strip to the steel work rolls. Entrained water-oil emulsion coolant and rolling oil mist and vapor will be captured through the mills' hooding and fume containment systems and will be routed to a multi-stage mist eliminator system designed for PM control and a condenser designed primarily for condensable PM emissions control and secondarily for some VOC emissions control.

Emission Unit ID: **CR-01-1 and CR-01-2**
Emission Unit Description: **Tandem Cold Mill #1**

20.1 Tandem Cold Mill Process Rates

20.1.1 Tandem Cold Mill Metal Processing Capacity

> Nominal hourly and annual production capacities are based current design estimates for the Cold Mill's coil processing capability.

Short-term aluminum throughput :	**310.0**	ton/hr	Maximum hourly Tandem Cold Mill coil process rate based on **engineering design basis for highest coil weight product (automotive)**
Maximum annual aluminum throughput:	**1,099,680**	tpy	Proposed operating constraint. Derived from product mix-weighted avg. (long-term avg.) TCM process rate (**158** ton/hr) assuming **maximum expected annual operating hours**.

20.2 PM and VOC Emission Factors for Tandem Cold Mill

> Cold Mills are a source of PM and VOC emissions due to roll coolant droplet entrainment and evaporative losses. A hooding and fume containment system will capture and direct a portion of the roll coolant mist and vapor emissions to the mist eliminator/condenser control train dedicated to the Cold Mill for PM and VOC control and then out a dedicated stack. Uncaptured emissions are released into the building space.

20.2.1 PM Emission Factors

Parameter	Value		Basis
Stack Emissions from Mist Eliminator			
Filt. PM Outlet Concentration for Mist Eliminator	0.0020	gr/dscf	PM emissions performance specification of mist eliminator system
Design Exhaust Flow of Mist Eliminator #3 (Actual Conditions)	142,000	acfm	Nominal fume exhaust system flow capacity from preliminary vendor fume exhaust system design.
Nominal Temperature of Mist Eliminator #3 Exhaust Flow	**74.7**	deg. F	**Nominal fume exhaust system temperature from preliminary vendor fume exhaust system design.**
Nominal Moisture Content of Mist Eliminator #3 Exhaust Flow	0.019	moist. frac.	Similar source stack test (Logan CM3 Feb. 2020 performance test) assuming Logan CM3 has a similar moisture content of exhaust as proposed Tandem Cold Mill.
Annual Average Barometric Pressure	29.68	in. Hg	AP-42 Chapter 7, Table 7.1-7, Meteorological Data for Selected US Locations, Mobile, AL; Converted from psia to in. Hg

Parameter	Value		Basis
Design Exhaust Flow of Condenser #1/Mist Eliminator #3	**136,568**	dscfm	17.647 x 142,000 acfm x (1 - 0.019 moist. frac.) x 29.68 in. Hg barometric press./(459.67 + 74.7 deg. F) = 136,568 dscfm; See sample equation from Logan CM3 test report
Filt. PM Stack Emission Factor **(Short-Term)**	**0.0076**	lb/ton	= 0.0020 gr filt. PM/dscf x 136,568 dscfm x 60 min/hr x 1 lb / 7,000 gr / 310.0 ton/hr
Filt. PM Stack Emission Factor (Long-Term)	**0.0148**	lb/ton	= 0.0020 gr filt. PM/dscf x 136,568 dscfm x 60 min/hr x 1 lb / 7,000 gr / 158.0 ton/hr

Average Stack Gas Flow at Standard Conditions (Qs), dscfm

$$Qs = 17.647 \times Qa \times (1 - BWS) \times \frac{Ps}{Ts}$$

Parameter	Value		Basis
Uncaptured Emissions			
Filt. PM Emission Control Efficiency of PPS	85%		Actual PM control efficiency stated in Kentucky Emissions Inventory System (KyEIS) Facility General Report for Logan CM3.
Capture Efficiency of Tandem Cold Mill Fume Exhaust System	95%		Engineering estimate based on configuration of mill hooding/fume containment system/enclosure.
Filt. PM Emissions Generated **(Short-Term)**	**0.053**	lb/ton	0.0076 lb filt. PM/ton / (100% -85% cont. eff.) / 95% capt. eff. = 0.053 lb filt. PM/ton
Uncapt. Filt. PM Released into Mill Building **(Short-Term)**	**0.0026**	lb/ton	0.053 lb filt. PM/ton x (100% - 95% Capt. Eff.) = 0.0026 lb filt. PM/ton
Filt. PM Emissions Generated (Long-Term)	**0.104**	lb/ton	0.0148 lb filt. PM/ton / (100% -85% cont. eff.) / 95% capt. eff. = 0.104 lb filt. PM/ton
Uncapt. Filt. PM Released into Mill Building (Long-Term)	**0.0052**	lb/ton	0.104 lb filt. PM/ton x (100% - 95% Capt. Eff.) = 0.0052 lb filt. PM/ton
Mill Building PM/PM10/PM2.5 Removal Efficiency	90%		Using the control credit for "enclosed by building" from TCEQ's Technical Guidance for Rock Crushing Plants (RG 058, Feb. 2022) as a guide, assume building removal efficiency is 90% for PM based on high air inflow rate to building for supplying control devices and large distances between uncaptured emissions sources and building openings.
Uncaptured Filt. PM Emission Factor **(Short-Term)**	**0.00026**	lb/ton	0.0026 lb filt. PM/ton x (100% - 90.00% building filt. PM removal eff.) = 0.00026 lb filt. PM/ton
Uncaptured Filt. PM Emission Factor (Long-Term)	**0.00052**	lb/ton	0.0052 lb filt. PM/ton x (100% - 90.00% building filt. PM removal eff.) = 0.00052 lb filt. PM/ton

20.2.2 PM10 Emission Factors

> The filterable PM10 stack and uncaptured emission factors are derived using the same approach applied for the filterable PM emission factors. Particle size data from the March 2019 engineering test of Logan's CM3 outlet is used to estimate the filterable PM10 to filterable PM emissions ratio.

> Novelis does not expect the proposed Tandem Cold Mill which uses a water-based coolant package and a condenser for VOC emissions control to be a quantifiable emissions source of condensable PM. In addition, the stack temperature for the Tandem Cold Mill is expected to fall below the 85 deg. F cutoff for Method 202 which defines condensable PM as a regulated pollutant.

Parameter	Value		Basis
Stack Emissions			
Stack Cond. PM Emission Factor	0.00	lb/ton	Assume condenser used for VOC control can maintain a stack temperature below 85 deg. F at all times as design basis, thereby eliminating any condensable PM emissions by definition (i.e., Method 202 condensable PM testing not required for exhaust stacks with temperatures below 85 deg. F).
Filt. PM10 to Filt. PM Emissions Ratio	0.95		Refer to Andersen Cascade Impactor (ACI) particle size distribution testing results for Logan CM3 outlet in March 2019 engineering test report
Filt. PM10 Stack Emission Factor **(Short-Term)**	**0.0072**	lb/ton	0.0076 lb filt. PM/ton x 0.95 lb filt. PM10/lb filt. PM = 0.0072 lb filt. PM10/ton
Filt. PM10 Stack Emission Factor (Long-Term)	**0.0140**	lb/ton	0.0148 lb filt. PM/ton x 0.95 lb filt. PM10/lb filt. PM = 0.0140 lb filt. PM10/ton
Stack Total PM10 Emission Factor **(Short-Term)**	**0.0072**	lb/ton	0.0072 lb filt. PM10/ton + 0.0000 lb cond. PM/ton = 0.0072 total PM10/ton
Stack Total PM10 Emission Factor (Long-Term)	**0.0140**	lb/ton	0.0140 lb filt. PM10/ton + 0.0000 lb cond. PM/ton = 0.0140 total PM10/ton

Parameter	Value		Basis
Uncaptured Emissions			
Filt. PM10 Emission Control Efficiency of Mult-Stage Mist Eliminator	75%		Particulate size-specific collection efficiency in size range of PM2.5-6 presented in AP-42, Appendix B, Table B.2-3 for high velocity mist eliminator chosen to be representative of multi-stage mist eliminator installed on the proposed Tandem Cold Mill.
Filt. PM10 Emissions Generated **(Short-Term)**	**0.030**	lb/ton	0.0072 lb filt. PM10/ton / (100% -75% cont. eff.) / 95% capt. eff. = 0.030 lb filt. PM/ton
Uncapt. Filt. PM10 Released into Mill Building **(Short-Term)**	**0.0015**	lb/ton	0.030 lb filt. PM10/ton x (100% - 95% capt. eff.) = 0.0015 lb filt. PM10/ton
Filt. PM10 Emissions Generated (Long-Term)	**0.059**	lb/ton	0.0140 lb filt. PM10/ton / (100% -75% cont. eff.) / 95% capt. eff. = 0.059 lb filt. PM/ton
Uncapt. Filt. PM10 Released into Mill Building (Long-Term)	**0.0030**	lb/ton	0.059 lb filt. PM10/ton x (100% - 95% capt. eff.) = 0.0030 lb filt. PM10/ton
Mill Building PM/PM10/PM2.5 Removal Efficiency	90%		Refer to previous PM/PM10/PM2.5 building removal efficiency basis in Section 20.2.1.
Uncaptured Total PM10 Emission Factor **(Short-Term)**	**0.00015**	lb/ton	0.0015 lb filt. PM10/ton x (100% - 90.0% building removal eff.) = 0.00015 lb filt. PM10/ton
Uncaptured Total PM10 Emission Factor (Long-Term)	**0.00030**	lb/ton	0.0030 lb filt. PM10/ton x (100% - 90.0% building removal eff.) = 0.00030 lb filt. PM10/ton

20.2.3 PM2.5 Emission Factors

> The filterable PM2.5 stack and uncaptured emission factors are derived using the same approach applied for the filterable PM emission factors. Particle size data from the March 2019 engineering test of Logan's CM3 outlet is used to estimate the filterable PM2.5 to filterable PM emissions ratio.

Parameter	Value		Basis
Stack Emissions			
Filt. PM2.5 to Filt. PM Emissions Ratio	0.85		Refer to ACI results for Logan CM3 outlet in March 2019 engineering test report
Stack Filt. PM2.5 Emission Factor **(Short-Term)**	**0.0064**	lb/ton	0.0076 lb filt. PM/ton x 0.85 lb filt. PM2.5/lb filt. PM = 0.0064 lb filt. PM2.5/ton
Stack Total PM2.5 Emission Factor **(Short-Term)**	**0.0064**	lb/ton	0.0064 lb filt. PM2.5/ton + 0.0000 lb cond. PM/ton = 0.0064 lb tot. PM2.5/ton
Stack Filt. PM2.5 Emission Factor (Long-Term)	**0.0126**	lb/ton	0.0148 lb filt. PM/ton x 0.85 lb filt. PM2.5/lb filt. PM = 0.0126 lb filt. PM2.5/ton
Stack Total PM2.5 Emission Factor (Long-Term)	**0.0126**	lb/ton	0.0126 lb filt. PM2.5/ton + 0.0000 lb cond. PM/ton = 0.0126 lb tot. PM2.5/ton
Uncaptured Emissions			
Filt. PM2.5 Control Efficiency of Multi-Stage Mist Eliminator	10%		Typical particulate size-specific collection efficiencies presented in AP-42, Appendix B, Table B.2-3 for high velocity mist eliminators.
Filt. PM2.5 Emissions Generated **(Short-Term)**	**0.0075**	lb/ton	0.006 lb filt. PM2.5/ton / (100% -10% cont. eff.) / 95% capt. eff. = 0.0075 lb filt. PM/ton
Uncapt. Filt. PM2.5 Released into Mill Building **(Short-Term)**	**0.00037**	lb/ton	0.0075 lb filt. PM2.5/ton x (100% - 95% Capt. Eff.) = 0.00037 lb filt. PM2.5/ton
Filt. PM2.5 Emissions Generated (Long-Term)	**0.0147**	lb/ton	0.0126 lb filt. PM2.5/ton / (100% -10% cont. eff.) / 95% capt. eff. = 0.0147 lb filt. PM/ton
Uncapt. Filt. PM2.5 Released into Mill Building (Long-Term)	**0.00073**	lb/ton	0.0147 lb filt. PM2.5/ton x (100% - 95% Capt. Eff.) = 0.00073 lb filt. PM2.5/ton
Mill Building PM/PM10/PM2.5 Removal Efficiency	90%		Refer to previous PM/PM10/PM2.5 building removal efficiency basis in Section 20.2.1.
Uncaptured Total PM2.5 Emission Factor **(Short-Term)**	**0.000037**	lb/ton	0.00037 lb filt. PM2.5/ton x (100% - 90% building filt. PM2.5 removal eff.) = 0.000037 lb filt. PM2.5/ton
Uncaptured Total PM2.5 Emission Factor **(Short-Term)**	**0.000073**	lb/ton	0.00073 lb filt. PM2.5/ton x (100% - 90% building filt. PM2.5 removal eff.) = 0.000073 lb filt. PM2.5/ton

20.2.4 VOC Emission Factors

> The stack VOC emission factor for the proposed Tandem Mill is derived from VOC concentration data from Logan's Cold Mill 3 January 2020 performance test with various scaling factors applied to account for differences in equipment design and expected operating practices between Logan's 3-stand CM3 and the proposed 2-stand TCM. The emission factor for VOC emissions generated is determined from the stack emission factor and estimates for the control efficiency of the condenser and capture efficiency of the mill's fume exhaust system.

Parameter	Value		Basis
Stack Emissions			
VOC Concentration from Similar Source Stack Test	62.0	ppmvd THC as C3H8	Based on calculated UPL concentration from Method 25A THC testing of a similar unit. UPL analysis performed on three (3) tested runs at a confidence level of 95%.
Mill Stand Scaling Factor	0.67		Two (2) Cold Mill stands for proposed Bay Minette site divided by three (3) stands for Logan's CM3. The number of mill stands is proportional to the amount of coolant/rolling oil applied and subsequently the amount of VOC emissions generated and discharged from the cold mill's condenser system (both Logan CM3 and the proposed TCM).
Base Oil Consumption Scaling Factor	0.59		Logan's CM3 consumes more base oil for the water/oil emulsion coolant formulation and base rolling oil on a production normalized basis even after considering the mill stand adjustment factor (2.52 L/mt x 2 stands/3 stands = 1.68 L/mt) as compared to Novelis' other water/oil emulsion coolant-based, 2-stand cold rolling mills at the Pindamonhangaba (Pinda), Brazil and Yeongju, South Korea sites (0.99 L/mt and 0.70 L/mt, respectively). This "Base Oil Consumption Scaling Factor" uses the maximum consumption rate from Pinda or Yeongju divided by the mill stand adjusted oil consumption rate from Logan's CM3 (0.99 L/mt / 1.68 L/mt = 0.59).
Outlet VOC Concentration from TCM Condenser	24.4	ppmvd as C3H8	62.0 ppmvd THC as C3H8 from Logan CM3 Jan. 2020 test UPL x 0.67 mill stand scaling factor x 0.59 base oil consumption scaling factor = 24.4 ppmvd THC as C3H8 adjusted concentration
Design Exhaust Flow of Condenser	**136,568**	dscfm	Assume same standard volumetric flow rate as upstream mist eliminator due to no additional exhaust gases added between main mist eliminator section and condenser.
Outlet VOC Emission Rate from TCM Condenser	22.87	lb/hr	(24.4 ppmvd THC as C3H8 x 44.1 lb C3H8/lbmole x 60 min/hr x 28.32) / (24.04 x 1E+06 x 454 g/lb) = 22.87 lb VOC/hr
VOC Emission Factor **(Short-Term)**	**0.074**	lb/ton	22.87 lb VOC/hr / 310.0 ton Al/hr = 0.074 lb VOC/ton
VOC Emission Factor **(Long-Term)**	**0.145**	lb/ton	22.87 lb VOC/hr / 158.0 ton Al/hr = 0.145 lb VOC/ton
Uncaptured Emissions			
VOC Emission Control Efficiency of Condenser	50%		Actual VOC control efficiency stated in KyEIS Facility General Report for Logan CM3. Also, supported by preliminary engineering design for the proposed TCM condenser system.
VOC Emissions Generated **(Short-Term)**	**0.16**	lb/ton	0.074 lb VOC/ton / (100% -50% cont. eff.) / 95% capt. eff. = 0.16 lb VOC/ton
VOC Emissions Generated (Long-Term)	**0.30**	lb/ton	0.145 lb VOC/ton / (100% -50% cont. eff.) / 95% capt. eff. = 0.30 lb VOC/ton
Uncaptured VOC Emission Factor **(Short-Term)**	**0.0078**	lb/ton	0.16 lb VOC/ton x (100% - 95% Capt. Eff.) = 0.0078 lb VOC/ton
Uncaptured VOC Emission Factor (Long-Term)	**0.015**	lb/ton	0.30 lb VOC/ton x (100% - 95% Capt. Eff.) = 0.015 lb VOC/ton

20.3 Summary of Tandem Cold Mill Potential Emissions

> Hourly potential emissions are calculated using the emission factor and maximum hourly process rate . Annual potential emissions are calculated using the emission factor and maximum annual process rates which includes voluntary operating constraint on tandem cold mill operating hours and aluminum throughput.

Pollutant	Emission Factor		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Stack Emissions						
PM (Short-Term)	0.0076	lb/ton	310.0	--	2.34	--
PM10 (Short-Term)	0.0072	lb/ton	310.0	--	2.22	--
PM2.5 (Short-Term)	0.0064	lb/ton	310.0	--	1.98	--
VOC (Short-Term)	0.074	lb/ton	310.0	--	22.87	--
PM (Long-Term)	0.0148	lb/ton	--	1,099,680	--	8.15
PM10 (Long-Term)	0.0140	lb/ton	--	1,099,680	--	7.72
PM2.5 (Long-Term)	0.0126	lb/ton	--	1,099,680	--	6.90
VOC (Long-Term)	0.145	lb/ton	--	1,099,680	--	79.59

Pollutant	Emission Factor		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Uncaptured Emissions						
PM (Short-Term)	0.00026	lb/ton	310.0	--	0.08	--
PM10 (Short-Term)	0.00015	lb/ton	310.0	--	0.05	--
PM2.5 (Short-Term)	0.000037	lb/ton	310.0	--	0.012	--
VOC (Short-Term)	0.0078	lb/ton	310.0	--	2.41	--
PM (Long-Term)	0.00052	lb/ton	--	1,099,680	--	0.29
PM10 (Long-Term)	0.00030	lb/ton	--	1,099,680	--	0.16
PM2.5 (Long-Term)	0.000073	lb/ton	--	1,099,680	--	0.04
VOC (Long-Term)	0.0152	lb/ton	--	1,099,680	--	8.38

Pollutant	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Total (Stack + Uncaptured) Emissions		
PM	2.42	8.43
PM10	2.27	7.89
PM2.5	2.00	6.94
VOC	25.28	87.97

21. Tension Leveler (Can Coating Line)

> The Tension Leveler consists of a set of rolls that flex and stretch the metal to remove any buckling and promote a uniform flatness when the Tension Leveler is operating in "bending mode." When the Tension Leveler is operating in "pure stretch mode," the work rolls are open and not engaged on the strip. The flattening is achieved by bending/stretching the coil strip through tension applied by the grip of the entry and exit rolls in bending mode and the bridle rolls in pure stretch mode.

> When the tension leveler is operating in bending mode, a lubricant is sprayed onto the coil strip at the tension leveler rolls to protect the surface finish of the metal as it passes over the rolls. This low vapor pressure lubricant has the potential to evaporate contributing to VOC emissions released within the coil finishing area building in relatively small quantities.

Emission Unit IDs: **CF-01-1**
Emission Unit Descriptions: **Tension Leveler (Can Coating Line)**

21.1 Tension Leveler Process Rates

21.1.1 Lubricant Usage Rate

> Emissions from the Tension Leveler are a function of the lubricant usage rate. Maximum hourly and annual lubricant usage rates are documented below.

Maximum hourly lubricant application rate:	**0.42** gal/hr	Tension Leveler design capacity
Maximum annual lubricant usage:	**3,664** gal/yr	

21.2 Documentation of Emission Factors Used for Tension Levelers

21.2.1 VOC Emission Factor

> VOC emissions from the Tension Levelers are generated through surface evaporation of lubricant on the aluminum strip. An assessment of VOC emissions from surface evaporation of lubricant on the strip is calculated using EPA's Emission Inventory Improvement Program (EIIP) Volume 2 Chapter 8 for Paint, Ink, and Other Coating Manufacturing Equation 8.4-22 for emissions from surface evaporation of VOCs and Equation 8.4-21 for the diffusion coefficient. **This resulting evaporative loss-based VOC emission factor is compared against the density of the applied lubricant to ensure that not more than 100% of the lubricant applied is assumed to be emitted. With the relatively low lubricant application rate, the evaporative loss calculation produces a VOC emission estimate which exceeds the mass of lubricant applied, so the density of the lubricant is used as the VOC emission factor working under the conservative assumption that 100% of the lubricant applied is emitted as VOC.**

Parameter	Value		Basis
Short Term Emission Rate			
Molecular Weight of Lubricant	198.39	lb/lb-mol	Lubricant (Magiesol 52 or equivalent) property using tetradecane as a surrogate
Wind Speed	11.18	mi/hr	Equivalent to maximum design line speed of 300 m/min
Gas Phase Mass Transfer Coefficient	0.013	ft/s	= 0.00438 x (11.18 mi/hr) ^ 0.78 x (18 / 198.39 lb/lb-mol) ^ (1/3)
Surface Area of Exposure	1,722	ft2	Distance from the entrance of the Tension Leveler to entry of vertical accumulator multiplied by the maximum strip width multiplied by two to include both strip sides
Vapor Pressure of Lubricant	0.0022	psia	Lubricant (Magiesol 52 or equivalent) property using tetradecane as a surrogate at 50 deg. C
Lubricant Temperature	582	R	Equivalent to maximum Tension Leveler temperature of 50 deg. C
VOC Hourly Emission Rate (Short Term)- **Evaporative Loss Calc.**	5.68	lb/hr	= 198.39 lb/lb-mol x 1.29E-02 ft/s x 1722.00 ft2 x 2.23E-03 psia x 3600 s/hr / (10.73 psia-ft3/R-lb-mol x 582 R)
VOC Emission Factor (Short Term)- **Evaporative Loss Calc.**	**13.58**	lb/gal	= 5.68 lb/hr / 0.42 gal/hr; Not used since exceeds lubricant density (i.e., >100% of lubricant applied is emitted as VOC)
Density of Lubricant	**6.87**	lb/gal	Lubricant (Magiesol 52 or equivalent) property
VOC Hourly Emission Rate (Short Term)- Lubricant Application Rate	**2.87**	lb/hr	= 0.42 gal/hr x 6.87 lb/gal
VOC Emission Factor (Short Term)- Lubricant Application Rate	**6.87**	lb/gal	Equivalent to lubricant density based on 100% VOC in lubricant and 100% loss of lubricant applied to air emissions fate
Long Term Emission Rate			
Vapor Pressure of Lubricant	0.0010	psia	Lubricant (Magiesol 52 or equivalent) property using tetradecane as a surrogate at 40 deg. C
Lubricant Temperature	564	R	Equivalent to maximum Tension Leveler temperature of 40 deg. C
VOC Hourly Emission Rate (Long Term)- **Evaporative Loss Calc.**	2.52	lb/hr	= 198.39 lb/lb-mol x 1.29E-02 ft/s x 1722.00 ft2 x 9.58E-04 psia x 3600 s/hr / (10.73 psia-ft3/R-lb-mol x 564 R)
VOC Emission Factor (Long Term)- **Evaporative Loss Calc.**	**6.02**	lb/gal	= 2.52 lb/hr / 0.42 gal/hr; Not used since generally similar to lubricant density (i.e., conservative to assume 100% of lubricant applied is emitted as VOC)
VOC Emission Factor (LongTerm)- Lubricant Application Rate	**6.87**	lb/gal	Equivalent to lubricant density based on 100% VOC in lubricant and 100% loss of lubricant applied to air emissions fate

21.3 Potential Emission Calculations for Tension Levelers

Pollutant	Emission Factor (lb/gal)	Emission Factor Basis	Maximum Hourly Lubricant Usage (gal/hr)	Maximum Annual Lubricant Usage (gal/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
VOC	6.87	100% Loss as VOC	0.42	3,664	2.87	12.59

22. Alkaline Cleaning Line #1 (Can Coating Line)

> At the entry end of the Can Coating Line, upstream of an accumulator, each aluminum coil is unwound and stitched to the preceding coil. The strip first passes through the tension levelling section and then is then passed through a cleaning and rinsing section where a water based alkaline solution is sprayed onto the sheet to remove residual lubricant oil that may be present on the coil surface prior to downstream surface coating processes.

> Water mist generated from the intensive spray cleaning is collected and routed through a scrubber with integral demister before exiting the building via a dedicated stack.

> Although the cleaning operation is a wet process, organic materials and inorganic PM, either as a gas or aerosol, may be present in the water mist routed through the scrubber.

> Novelis will use a hot air blower to remove moisture on the strip at the exit of the Alkaline Cleaning Operation.

Emission Unit IDs: **CF-02-1**
Emission Unit Descriptions: **Alkaline Cleaning Line #1 (Can Coating Line)**

22.1 Alkaline Cleaning Line #1 (Can Coating Line) Process Rates

22.1.1 Strip Area Processing Capacity

> The alkaline cleaning emissions are predominantly a function of the area of the strip processed. This maximum strip area can be calculated from the maximum hourly aluminum throughput rate and an estimate for the average coil gauge for the planned line product mix.

Short-term aluminum throughput :	19.4	ton/hr	
Average coil gauge produced:	0.0082	inches	Design specification for Coating Line
Density of aluminum:	169.18	lb/ft3	
Short-term strip area throughput :	336.09	Mft2/hr	= 19.4 ton/hr x 2000 lb/ton / 169.2 lb/ft3 / (0.008 in /12 in/ft) / 1,000 ft2/Mft2
Maximum annual aluminum throughput:	169,948	tpy	
Maximum strip area throughput:	2,944,111	Mft2/yr	= 169,948 tpy x 2000 lb/ton / 169.2 lb/ft3 / (0.008 in / 12 in/ft) / 1,000 ft2/Mft2

22.2 Documentation of Emission Factors Used for Alkaline Cleaning Operation

22.2.1 PM Emission Factor

> Based on the emissions estimate from a prospective equipment vendor for similar equipment, the PM emissions for the cleaning process are 5 mg/m3 based on the outlet concentration from the scrubber.

> Given the very low levels of estimated emissions, all PM is conservatively counted in the PM2.5 size fraction.

Parameter	Value		Basis
Demister/scrubber Exit Loading	5	mg/m3	
Demister/scrubber Exit Loading	0.0022	gr/acf	= 5 mg/m3 x 2.20462e-6 lb/mg x 7000 gr/lb / 35.31 acf/m3
Exhaust Flowrate for Alkaline Cleaning Section Stack	7,653	acfm	
Maximum Hourly PM/PM10/PM2.5 Emissions	0.14	lb/hr	= 0.0022 gr/acf / 7000 gr/lb x 7,653 acfm x 60 min/hr
PM/PM10/PM2.5 Emission Factor	4.26E-04	lb/Mft2	= 0.143 lb/hr / 336.09 Mft2/hr

22.2.2 VOC Emission Factor

> Before it is passed through the Can Coating Line, the alkaline cleaning section is designed to rinse off residual lubricating oils that may be present on the coil strip before it is passed to the downstream surface coating processes. This is a wet process and the expectation is that nearly all residual oil will be captured in the rinse water. In addition, the residual oils that may be present on the coil strip are very low vapor pressure roll coolants that would not be associated with any appreciable evaporative losses.

> Based on the low vapor pressures of the residual cold mill rolling oil and tension leveler lubricant and the relatively low temperature of the alkaline cleaning bath (140 deg. F), vapor-liquid equilibrium calculations reveal that it would be very conservative to assume that 2% of the VOC content of the residual oil/lubricant content on the coil strip was lost to the air phase.

> The internal specification that Novelis will target for the maximum amount of residual oil that can be present on the mill finish coils sent to the Line is **15 mg/m2/side plus the additional 15 g/m2/side** of low vapor pressure tension leveler lubricant applied to the strip.

> Given the residual oil content and assumed loss rate, the annual VOC emissions can be calculated on a mass balance basis knowing the maximum square feet of coil strip the Line can process.

Parameter	Value		Basis
Maximum Residual Oil Content on Coils at Inlet (per side)	30	mg/m2/side	Design specification for Can Coating Line (maximum capacity of cleaning section)
Total Residual Oil Cleaned from Coils	0.012	lb/Mft2	= 30 mg/m2 x 2 sides / 1000 mg/g / 453.593 g/lb / 3.2808^2 ft2/m2 x 1,000 ft2/Mft2
Maximum Evaporative Loss Rate to Air Phase	2%		
VOC Emission Factor	0.00025	lb/Mft2	= 2% x 0.0123 lb/Mft2

22.3 Potential Emission Calculations for Alkaline Cleaning Operations

Pollutant	Emission Factor (lb/Mft2)	Emission Factor Basis	Maximum Hourly Process Rate (Mft2/hr)	Maximum Annual Process Rate (Mft2/yr)	Potential Emission Rate (lb/hr)	(tpy)
PM	0.00043	Vendor Estimate	336.1	2,944,111	0.14	0.63
PM10	0.00043	Vendor Estimate	336.1	2,944,111	0.14	0.63
PM2.5	0.00043	Vendor Estimate	336.1	2,944,111	0.14	0.63
VOC	0.00025	Engineering Estimate	336.1	2,944,111	0.08	0.36

23. Coating Line #1

> The Coating Line is used to apply coatings to both sides of the strip. The coater has a “S” type configuration with one set of back-up rolls, one top coating head with two rolls (applicator and pick-up roll), and one back coating head with two rolls (applicator roll and pick-up roll). The coating heads are designed to work at the same time and are placed in a way to permit coating of both sides of the strip in one continuous pass through the Coating Line. The coating machine is designed for precise application of the coating to the top and bottom side of the passing strip by means of either forward or reverse application.

> A curing oven will be designed to cure the reference strip at maximum process speed when a coating not exceeding the defined maximum solvent load is applied to it. Under these conditions, the oven shall be capable of reaching the defined target peak metal temperature (PMT). The oven is heated by heat recovered from the regenerative thermal oxidizer (RTO) and by zone burners (one for each zone) mounted in the zone circulation chamber.

> An air cooler will be designed to cool the strip after it leaves the curing oven. Filtered ambient air will be fed to the air cooler's last zone either from the inside or from the outside of the building. The air will then be cascaded into the upstream cooling zones. Exhaust air from the first zone at the entry end of the air cooler will be discharged into the atmosphere without treatment.

> A multi-chamber RTO with a high thermal energy recovery efficiency will be used to control VOC emissions from the Coating Line coater heads and the curing oven using a series of natural gas-fired burners

Emission Unit IDs:	**CF-03-1 through CF-03-2**
Emission Unit Description:	**Coating Line #1**

23.1 Coating Line Process Rates: Metal Throughput and Maximum Gas Usage Rates

23.1.1 Coating Line Aluminum Processing Capacity

Maximum Hourly Aluminum Coil Processing Rate:	**19.4**	ton/hr
Maximum Annual Aluminum Coil Processing Rate:	**169,948**	tpy

23.1.2 Coating Line Natural Gas Firing Rate

Rated Hourly Heat Input Capacity of Coating Line Burners:	**44.1**	MMBtu/hr
Rated Annual Heat Input Capacity of Coating Line Burners:	**385,966**	MMBtu/yr
Maximum Hourly Natural Gas Usage Rate for Coating Line:	**0.044**	MMscf/hr
Maximum Annual Natural Gas Usage Rate for Incinerator:	**385.97**	MMscf/yr

23.2 Documentation of Emission Factors Used for Coating Line

> Emission factors for VOC and PM/PM10/PM2.5 emissions associated with coating usage/aluminum production are based on vendor estimates for the RTO emissions performance or similar source stack test data. Emissions in the filterable PM10 and PM2.5 size fractions are estimated using data from EPA's PM Calculator database for the appropriate SCC (4-02-002-10) associated with the existing Coating Line [i.e., Petroleum and Solvent Evaporation, Surface Coating Operations (4-02), Surface Coating Application - General (4-02-002), Paint: Water-base (4-02-002-10)].

> Potential emissions of filterable PM, VOC, and SO2 from natural gas combustion are estimated using standard natural gas combustion emission factors published in AP-42 Section 1.4 (7/98 Edition) for small (<100 MMBtu/hr) combustion units. Refer to Section 9.2.3 for the total PM10 and PM2.5 emission factor derivation.

> Potential emissions of NOX and CO from the Coating Line burners are calculated based on emissions performance estimates from candidate equipment suppliers.

> Emission factors for GHGs are those presented previously in Section 3 of Appendix B.

23.2.1 Emission Factors for Aluminum Production

Parameter	Value		Basis
VOC Emission Factor			
VOC Inlet Loading to Coating Line RTO from Coating Usage	1,184	lb/hr	Maximum solvent loading from maximum coating application rate and worst-case VOC content of the coatings applied.
Maximum Exhaust Flow Rate for Coating Line RTO (Standard Conditions)	60,000	Nm^3/hr	Design specification for the Coating Line RTO
Outlet VOC Concentration from Coating Line RTO	20	mg/Nm3	VOC emissions performance specification for Coating Line RTO
Outlet VOC Emission Rate for Coating Line RTO	2.65	lb/hr	= 20.0 mg VOC/Nm3 x 1 g/1,000 mg x 1 lb/453.59 g x 60,000 Nm3/hr
Nominal Coating Line RTO VOC Control Efficiency	99.8	%	= 1 - 2.65 lb VOC/hr at RTO Outlet / 1,184 lb VOC/hr at RTO Inlet
VOC Emission Factor	0.136	lb/ton	= 2.65 lb VOC/hr at RTO Outlet / 19.4 ton/hr
PM/PM10/PM2.5 Emission Factor			
Outlet Filt. PM Concentration from Coating Line RTO	20	mg/Nm3	Filt. PM emissions performance demonstrated in a recent stack test of Novelis' similar Coating Line in Pindamonhangaba, Brazil
Filt. PM Emission Factor	0.136	lb/ton	= 20.0 mg filt. PM/Nm3 x 1 g/1,000 mg x 1 lb/453.59 g x 60,000 Nm3/hr / 19.4 ton/hr
Filt. PM10 to Filt. PM Ratio	0.94	--	EPA PM Calculator for appropriate SCC
Filt. PM10 Emission Factor	0.128	lb/ton	0.136 lb Filt. PM/ton x 0.94 lb Filt. PM10/lb Filt. PM = 0.128 lb Filt. PM10/ton
Filt. PM2.5 to Filt. PM Ratio	0.78	--	EPA PM Calculator for appropriate SCC
Filt. PM2.5 Emission Factor	0.106	lb/ton	0.136 lb Filt. PM/ton x 0.78 lb Filt. PM2.5/lb Filt. PM = 0.106 lb Filt. PM2.5/ton

23.2.2 Emission Factors for Coating Line RTO and Curing Oven Operation - Natural Gas Combustion

Parameter	Value		Basis
Outlet NOX Concentration from Coating Line RTO	50	mg/Nm^3	NOX emissions performance specification for Coating Line RTO
NOX Emission Factor	150.11	lb/MMscf	= 50 mg NOX/Nm3 x 1 g/1,000 mg x 1 lb/453.59 g x 60,000 Nm3/hr / 0.044 MMscf/hr
Outlet CO Concentration from Coating Line RTO	100	mg/Nm^3	CO emissions performance specification for Coating Line RTO
CO Emission Factor	300.22	lb/MMscf	= 100 mg CO/Nm3 x 1 g/1,000 mg x 1 lb/453.59 g x 60,000 Nm3/hr / 0.044 MMscf/hr

23.3 Potential Emission Calculations for Coating Line

> Hourly potential emissions are calculated using the emission factor and maximum hourly process rate. Annual potential emissions are calculated using the emission factor and maximum annual process rates based on continuous operation at the short-term potential process rate.

23.3.1 Potential Emissions from Aluminum Production

Pollutant	Emission Factor		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.136	lb/ton	19.4	169,948	2.65	11.59
PM10	0.128	lb/ton	19.4	169,948	2.49	10.89
PM2.5	0.106	lb/ton	19.4	169,948	2.06	9.04
VOC	0.14	lb/ton	19.4	169,948	2.65	11.59
Total HAPs (Assume VOC = HAP)	0.14	lb/ton	19.4	169,948	2.65	11.59

23.3.2 Potential Emissions from Natural Gas Combustion

Pollutant	Emission Factor	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	1.90 lb/MMscf	0.044	385.97	0.08	0.37
PM10	3.47 lb/MMscf	0.044	385.97	0.15	0.67
PM2.5	3.47 lb/MMscf	0.044	385.97	0.15	0.67
NOX	150.11 lb/MMscf	0.044	385.97	6.61	28.97
CO	300.22 lb/MMscf	0.044	385.97	13.23	57.94
VOC	5.50 lb/MMscf	0.044	385.97	0.24	1.06
SO2	0.60 lb/MMscf	0.044	385.97	0.03	0.12
CO2	116,977 lb/MMscf	0.044	385.97	5,154	22,575
CH4	2.20 lb/MMscf	0.044	385.97	0.10	0.43
N2O	0.22 lb/MMscf	0.044	385.97	0.01	0.04
CO2e	117,097 lb/MMscf	0.044	385.97	5,159	22,598
Lead	5.00E-04 lb/MMscf	0.044	385.97	2.20E-05	9.65E-05
Total HAPs	1.89 lb/MMscf	0.044	385.97	0.08	0.36

24. Edge Trimmer- Electrostatic Oiler

> The aluminum strip exiting the prior stages of the Coating Line can pass through an edge trimmer to trim the strip down to desired size. An electrostatic oiler is used to apply lubricant for the edge trimmer. The scrap trimmed off the strip will be suctioned away to the scrap baller.

> Lubricant is applied to the moving aluminum strip via a spray blade that employs an electrostatic process. A high voltage charge is applied to the lubricant as it leaves the spray blade. The charged and atomized lubricant is drawn by opposite charge to the surface of the coil strip. Due to the electrostatic nature of the applicator, the transfer efficiencies are extremely high and there is very minimal overspray.

> Although the lubricant is stable on the coil, as applied, there is a potential for evaporative loss of the VOC content of the material. There may also be a small amount of PM emissions due to lubricant aerosols that are not captured on the coil surface. However, emissions for both pollutants will be extremely low. There is no dedicated stack for the electrostatic oiler, and any emissions generated are released into the Coil Finishing building as fugitive emissions.

Emission Unit IDs: **CF-04-1**
Emission Unit Descriptions: **Edge Trimmer- Electrostatic Oiler**

24.1 Edge Trimmer- Electrostatic Oiler Process Rates

24.1.1 Strip Area Processing Capacity

> The electrostatic oiler missions are predominantly a function of the area of the strip processed. This maximum strip area can be calculated from line speed and the width of the strips processed.

Maximum width of strip processed:	2,150	mm	Design specification for edge trimmer
Maximum line speed:	1,850	m/min	Design specification for edge trimmer
Maximum strip area processed:	238,650	m2/hr	= 2,150mm / 1,000 mm/1m x 1,850m/min x 60 min/hr

24.2 Documentation of Emission Factors Used for Electrostatic Lubing

24.2.1 VOC Emission Factor

> Various lubricants will be used by the electrostatic oiler. Based on a review of specifications for the potential lubricants that may be applied, the densities were averaged to be 7.3 lb/gal. To conservatively define potential VOC emissions and to accommodate potential variations in lubricants used, a representative VOC content (via Method 24 testing) was used from a similar process at another coil finishing operation (Aluminum Dynamics in Columbus, MS)

Parameter	Value		Basis
Lubricant Application Rate per Side (Maximum Expected)	0.27	g/m2/side	Maximum needed to meet customer requirements
Total Lubricant Application Rate (Maximum Expected)	0.54	g/m2	Per side rate multiplied by two to account for application of lubricant to top and bottom of strip
Lubricant Density (Typical)	7.30	lb/gal	Based on proposed lubricant densities
Maximum VOC Content of Lubricant (AL Dynamics)	6.76%		Based on Aluminum Dynamics from Method 24 sampling of representative lubricant
Maximum VOC Density (Typical)	0.49	lb/gal	7.30 lb/gal x 6.76 % = 0.49 lb/gal
Maximum Evaporative Loss Rate to Air Phase	10%		Based on Electrostatic process adhesion and low volatility of applied lubricant
VOC Emission Factor	0.00805	lb/Mm2	= (0.54g/m2 x 1 lb/453.49 g / 7.30lb/gal) x 0.49lb/gal x 1,000 m2/Mm2 x 10% Evap. Loss Rate

24.2.2 PM Emission Factor

> Due to the electrostatic nature of the process, the transfer of lubricant from the spray bar to the moving coil strip is near 100%. In the design for the Electrostatic Oiler process, a transfer efficiency of 98.0% is considered conservative. Furthermore, a 90% building efficiency is applied to account for capture that will be provided by the electrostatic oiler enclosure and the finishing building before overspray aerosols escape to the atmosphere. This transfer efficiency value and enclosure/building efficiency are applied to the lubricant usage rate to quantify PM emissions.

> All PM emissions are conservatively counted as being in the PM2.5 size range.

Parameter	Value	Basis
Lubricant Application Transfer Efficiency to Strip	98%	Vendor-supplied engineering estimate
Electrostatic Lubing Enclosure & Building PM Removal Efficiency	90%	Assume enclosure/building removal efficiency is 90% for PM based on the electrostatic oil enclosure and large distances between the emissions source and building openings, which will facilitate aerosol impaction.
Potential PM/PM10/PM2.5 emissions:	0.0024 lb/Mm2	= 0.54 g/m2 x 1 lb / 453.49 g x 1,000 m2/Mm2 x (100% - 98%) x (100% - 90%)

24.3 Potential Emission Calculations for Edge Trimmer Electrostatic Oiler

> Hourly potential emissions are calculated using the emission factor and maximum hourly process rate. Annual potential emissions are calculated using the emission factor and maximum annual process rates based on continuous operation at the short-term potential process rate.

24.3.1 Potential Emissions from Aluminum Production

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (Mm2/hr)	Maximum Annual Process Rate (Mm2/yr)	Potential Emission Rate (lb/hr)	(tpy)
PM	0.0024 lb/Mm2	Engineering Estimate	238.7	2,090,574	0.57	2.49
PM10	0.0024 lb/Mm2	Engineering Estimate	238.7	2,090,574	0.57	2.49
PM2.5	0.0024 lb/Mm2	Engineering Estimate	238.7	2,090,574	0.57	2.49
VOC	0.0080 lb/Mm2	Engineering Estimate	238.7	2,090,574	1.92	8.41

25. Edge Trimmer- Scrap Baller

> The aluminum strip trimmed in the edge trimmer produces scrap aluminum. The scrap trimmed off the strip will be ducted into chutes where the scrap is then collected and pressed in a ball (or bale). Because this scrap baller will use a pneumatic conveyance of the scrap, a wet scrubber will be used to reduce PM emissions that result from moving the scrap aluminum.

Emission Unit IDs: **CF-05-1**
Emission Unit Descriptions: **Edge Trimmer- Scrap Baller**

25.1 Edge Trimmer- Scrap Baller Process Rates

25.1.1 Aluminum Processing Capacity

> The scrap baller emissions are predominantly a function of the mass of aluminum scrap processed and associated aluminum fines/dust generated. The maximum throughput of aluminum processed can be calculated from the design specifications of the scrap baller.

Maximum aluminum processed:	13 ton/hr	
Maximum aluminum processed annually:	113,880 tpy	= 13 ton/hr x 8,760 hr/yr

25.2 Documentation of Emission Factors Used for Scrap Balling

> The filterable (filt.) PM emission factor is presented as the expected exit grain loading associated with the scrubber controlling the scrap baller converted to a lb/SCC unit basis (i.e., lb/ton Al) using the rated aluminum throughput capacity of the scrap baller.

> All PM emissions are conservatively counted as being in the PM2.5 size range.

Stack Emissions		
Controlled Filt. PM Emission Factor (Grain Loading Basis)	20.0 mg/m3	Exit grain loading design basis of wet scrubber according to vendor specifications
Scrubber/Demister #2 Exhaust Flow	6,100 Nm3/hr	Wet scrubber design basis
Controlled Filt. PM Emission Factor (Production Basis)	0.021 lb/ton	20.0 mg/m3 x 1 g / 1,000 mg x 1 lb / 453.49 g x 6,100 Nm3/hr / 13.0 ton Al/hr = 0.021 lb PM/ton Al
Uncontrolled Emissions		
Uncontrolled Filt. PM Emission Factor (Grain Loading Basis)	400.0 mg/m3	Inlet grain loading design basis of wet scrubber according to vendor specifications
Uncontrolled Filt. PM Emission Factor (Production Basis)	0.414 lb/ton	400.0 mg/m3 x 1 g / 1,000 mg x 1 lb / 453.49 g x 6,100 Nm3/hr / 13.0 ton Al/hr = 0.414 lb PM/ton Al

25.3 Potential Emission Calculations for Edge Trimmer Scrap Baller

> Hourly potential emissions are calculated using the emission factor and maximum hourly process rate. Annual potential emissions are calculated using the emission factor and maximum annual process rates based on continuous operation at the short-term potential process rate.

25.3.1 Potential Emissions from Aluminum Production

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.021 lb/ton	Vendor specifications	13.0	113,880	0.27	1.18
PM10	0.021 lb/ton	Vendor specifications	13.0	113,880	0.27	1.18
PM2.5	0.021 lb/ton	Vendor specifications	13.0	113,880	0.27	1.18

~~26. Hot Water Boilers (Removed from Project Scope)~~

> Natural gas-fired Hot Water Boilers (3) were removed from project scope, but this calculation section is retained as a placeholder/historical reference.

27. Cooling Towers

> **Five (5)** multi-cell mechanical draft, wet cooling towers will be installed to supply cooling water to the casting machines**, hot mill, cold mill, coil finishing, and other** cooling water users.

> As the water flows down through the cooling tower, the draft air picks up water droplets that can be emitted from the top of the tower (i.e., "drift loss"). Drift loss is minimized through the use of mist eliminators. PM emissions result from residual solids remaining after evaporation of the liquid droplets released from the cooling tower. No VOC/HAP-containing water treatment chemicals will be used in the cooling tower, and the cooling water will not contact any process materials containing VOC/HAP. Therefore, the cooling tower will not be a quantifiable source of VOC/HAP emissions.

Emission Unit ID: **AS-04-1**
Emission Unit Description: **Caster Cooling Tower #1**

Emission Unit ID: **AS-05-1**
Emission Unit Description: **Hot Mill Cooling Tower**

Emission Unit ID: **AS-26-1**
Emission Unit Description: **Cold Mill Cooling Tower**

Emission Unit ID: **AS-27-1**
Emission Unit Description: **Finishing Cooling Tower**

Emission Unit ID: **AS-28-1**
Emission Unit Description: **Round Tops/Pushers Cooling Tower**

27.1 Methodology for Quantifying Potential PM Emissions

> Potential PM emissions from the cooling towers are estimated based on the calculation methodology presented in AP-42 Chapter 13.4 for Wet Cooling Towers (1/95) and particle size distribution methodologies data presented in "Calculating Realistic PM10 Emissions from Cooling Towers" by Joe Reisman and Gordon Frisbie, Environmental Progress, Volume 21, Issue 2 (April 20, 2004) (herein referred to as Reisman Frisbie).

27.1.1 Caster Cooling Tower #1 Design Values

Parameter	Value		Basis
Circulating Water Flow Rate	**10,580** **0.63**	gal/min MMgal/hr	Design specification = 10,580 gal/min x 60 min/hr / 1E6 gal/MMgal
Total Dissolved Solids (TDS) of Recirculating Water	1,000	ppm	Conservative engineering estimate
Drift Percentage for Cooling Tower Mist Eliminator	0.001	%	Design specification
Water Density	8.34	lb/gal	

27.1.2 Hot Mill Cooling Tower Design Values

Parameter	Value		Basis
Circulating Water Flow Rate	18,000	gal/min	Design specification
	1.08	MMgal/hr	= 18,000 gal/min x 60 min/hr / 1E6 gal/MMgal
Total Dissolved Solids (TDS) of Recirculating Water	1,000	ppm	Conservative engineering estimate
Drift Percentage for Cooling Tower Mist Eliminator	0.001	%	Design specification
Water Density	8.34	lb/gal	

27.1.3 Cold Mill Cooling Tower Design Values

Parameter	Value		Basis
Circulating Water Flow Rate	12,000	gal/min	Design specification
	0.72	MMgal/hr	= 12,000 gal/min x 60 min/hr / 1E6 gal/MMgal
Total Dissolved Solids (TDS) of Recirculating Water	1,000	ppm	Conservative engineering estimate
Drift Percentage for Cooling Tower Mist Eliminator	0.001	%	Design specification
Water Density	8.34	lb/gal	

27.1.4 Finishing Cooling Tower Design Values

Parameter	Value		Basis
Circulating Water Flow Rate	980	gal/min	Design specification
	0.059	MMgal/hr	= 0,980 gal/min x 60 min/hr / 1E6 gal/MMgal
Total Dissolved Solids (TDS) of Recirculating Water	1,000	ppm	Conservative engineering estimate
Drift Percentage for Cooling Tower Mist Eliminator	0.001	%	Design specification
Water Density	8.34	lb/gal	

27.1.5 Round Tops/Pushers Cooling Tower Design Values

Parameter	Value		Basis
Circulating Water Flow Rate	1,400	gal/min	Design specification
	0.084	MMgal/hr	= 1,400 gal/min x 60 min/hr / 1E6 gal/MMgal
Total Dissolved Solids (TDS) of Recirculating Water	1,000	ppm	Conservative engineering estimate
Drift Percentage for Cooling Tower Mist Eliminator	0.001	%	Design specification
Water Density	8.34	lb/gal	

27.1.6 PM Emission Factor For Each Cooling Tower

Caster Cooling Tower #1

Parameter	Value	Basis
PM Emission Rate	0.0834 lb/MMgal	**= 10,580 gal/min x 60 min/hr x 8.34 lb/gal x 0.001 lb solid/lb water x 0.001% / 0.63 MMgal/hr**

Hot Mill Cooling Tower

Parameter	Value	Basis
PM Emission Rate	0.0834 lb/MMgal	**= 18,000 gal/min x 60 min/hr x 8.34 lb/gal x 0.001 lb solid/lb water x 0.001% / 1.08 MMgal/hr**

Cold Mill Cooling Tower

Parameter	Value	Basis
PM Emission Rate	0.0834 lb/MMgal	= 12,000 gal/min x 60 min/hr x 8.34 lb/gal x 0.001 lb solid/lb water x 0.001% / 0.72 MMgal/hr

Finishing Cooling Tower

Parameter	Value	Basis
PM Emission Rate	0.0834 lb/MMgal	= 980 gal/min x 60 min/hr x 8.34 lb/gal x 0.001 lb solid/lb water x 0.001% / 0.06 MMgal/hr

Round Tops/Pushers Cooling Tower

Parameter	Value	Basis
PM Emission Rate	0.0834 lb/MMgal	= 1,400 gal/min x 60 min/hr x 8.34 lb/gal x 0.001 lb solid/lb water x 0.001% / 0.08 MMgal/hr

27.1.7 Cooling Tower Particle Size Distribution

> The aerodynamic diameter of a particle resulting from drift was calculated over a target droplet size distribution presented in the table below. By interpolating on the calculated aerodynamic particle diameter, the corresponding mass percentage smaller than PM2.5 and PM10 can be derived.

Droplet Diameter Size[1] (µm)	EPRI % Mass Smaller[1] (%)	Droplet Volume (μm^3)	Droplet Mass (µg)	Particle Mass (Solids) (µg)	Solid Particle Volume (μm^3)	Solid Particle Diameter (µm)	Aerodyn. Particle Diameter (µm)
10	0	524	5.24E-04	5.24E-07	0.24	0.77	1.1
20	0.196	4,189	4.19E-03	4.19E-06	1.90	1.54	2.3
21.9	***0.234***	***5,516***	***5.52E-03***	5.52E-06	***2.51***	1.69	***2.5***
30	0.226	14,137	0.01	1.41E-05	6.43	2.31	3.4
40	0.514	33,510	0.03	3.35E-05	15.23	3.08	4.6
50	1.816	65,450	0.07	6.54E-05	29.75	3.84	5.7
60	5.702	113,097	0.11	1.13E-04	51.41	4.61	6.8
70	21.348	179,594	0.18	1.80E-04	81.63	5.38	8.0
87.7	***46.519***	***353,010***	***0.35***	3.53E-04	***160.46***	6.74	***10.0***
90	49.812	381,704	0.38	3.82E-04	173.50	6.92	10.3
110	70.509	696,910	0.70	6.97E-04	317	8.46	12.5
130	82.023	1,150,347	1.15	1.15E-03	523	10.00	14.8
150	88.012	1,767,146	1.77	1.77E-03	803	11.53	17.1
180	91.032	3,053,628	3.05	3.05E-03	1,388	13.84	20.5
210	92.468	4,849,048	4.85	4.85E-03	2,204	16.15	23.9
240	94.091	7,238,229	7.24	7.24E-03	3,290	18.45	27.4
270	94.689	10,305,995	10.31	1.03E-02	4,685	20.76	30.8
300	96.288	14,137,167	14.14	1.41E-02	6,426	23.07	34.2
350	97.011	22,449,298	22.45	2.24E-02	10,204	26.91	39.9
400	98.340	33,510,322	33.51	3.35E-02	15,232	30.76	45.6
450	99.071	47,712,938	47.71	4.77E-02	21,688	34.60	51.3
500	99.071	65,449,847	65.45	6.54E-02	29,750	38.44	57.0
600	100	113,097,336	113.10	1.13E-01	51,408	46.13	68.4

Bold highlights indicate interpolated values to determine $PM_{10}/PM_{2.5}$ speciation.

[1] Based on drift droplet size distribution testing from EPRI test facility published in the Reisman and Frisbie paper.

> By interpolating the data in Reisman and Gordon for a tower with 1,000 ppm TDS circulating water, PM10 was estimated to be 46.5% of the total particulate matter and PM2.5 was estimated to be 0.23% of the total particulate matter.

Parameter	Value	Basis
Estimated PM10/PM Ratio	0.47	EPRI ratio of mass smaller than PM10
PM10 Emission Factor	0.039 lb/MMgal	= 0.083 lb PM/MMgal x 0.47 PM10/PM
Estimated PM2.5/PM Ratio	2.34E-03	EPRI ratio of mass smaller than PM2.5
PM2.5 Emission Factor	1.95E-04 lb/MMgal	= 0.083 lb PM/MMgal x 0.0023 PM2.5/PM

27.2 Potential Emission Calculations for Cooling Towers

27.2.1 Cooling Tower Emissions by Unit

Emission Unit	Maximum Hourly Process Rate (MMgal/hr)	Maximum Annual Process Rate (MMgal/yr)	Pollutant	Emission Factor (lb/MMgal)	Emission Factor Basis	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
AS-04-1 - Caster Cooling Tower #1	0.63	5,561	PM	0.083	Engineering Estimate	0.053	0.23
			PM10	0.039		0.025	0.11
			PM2.5	1.95E-04		1.24E-04	5.42E-04
AS-05-1 - Hot Mill Cooling Tower	1.08	9,461	PM	0.083	Engineering Estimate	0.090	0.39
			PM10	0.039		0.042	0.18
			PM2.5	1.95E-04		2.10E-04	9.22E-04
AS-26-1 - Cold Mill Cooling Tower	0.72	6,307	PM	0.083	Engineering Estimate	0.060	0.26
			PM10	0.039		0.028	0.12
			PM2.5	1.95E-04		1.40E-04	6.15E-04
AS-27-1 - Finishing Cooling Tower	0.059	515	PM	0.083	Engineering Estimate	4.90E-03	0.021
			PM10	0.039		2.28E-03	0.010
			PM2.5	1.95E-04		1.15E-05	5.02E-05
AS-28-1 - Round Tops/Pushers Cooling Tower	0.084	736	PM	0.083	Engineering Estimate	7.01E-03	0.031
			PM10	0.039		3.26E-03	0.014
			PM2.5	1.95E-04		1.64E-05	7.17E-05

27.2.2 Total Cooling Tower Emissions

Pollutant	Emission Factor (lb/MMgal)	Emission Factor Basis	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.083	Engineering Estimate	0.21	0.94
PM10	0.039	Engineering Estimate	0.10	0.44
PM2.5	1.95E-04	Engineering Estimate	5.02E-04	2.20E-03

28. Emergency Generator Engines

> Nine (9) natural gas-driven emergency generators of various sizes will be installed to supply power in the event of unforeseen outages. The potential emission calculations below rely on the manufacturer's emissions-related data where available in place of reference emission factors from AP-42.

28.1 Engine Power and Fuel Consumption Data

Emission Unit ID	Emission Unit Description	Process Description	Engine Rating (hp)	Hourly Fuel Usage Rate (MMscf/hr)	Annual Operating Hours (hr/yr)	Annual Fuel Usage Rate (MMscf/yr)	Heating Value of Natural Gas (Btu/scf)
AS-06-1	Emergency Generator Engine #1 (Security Office)	Natural Gas Burned	304.0	0.0024	500	1.20	1,000
AS-07-1	Emergency Generator Engine #2 (Admin. Building)	Natural Gas Burned	304.0	0.0024	500	1.20	1,000
~~AS-08-1~~	~~Emergency Generator Engine #3 (Remelt- Cold End)~~	~~Natural Gas Burned~~	~~304.0~~	~~0.0026~~	~~500~~	~~1.29~~	~~1,000~~
~~AS-09-1~~	~~Emergency Generator Engine #4 (Remelt- Hot End)~~	~~Natural Gas Burned~~	~~304.0~~	~~0.0026~~	~~500~~	~~1.29~~	~~1,000~~
AS-10-1	Emergency Generator Engine #5 (Hot Reversing Mill)	Natural Gas Burned	160.9	0.0014	500	0.69	1,000
AS-11-1	Emergency Generator Engine #6 (Hot Finishing Mill)	Natural Gas Burned	261.5	0.0020	500	0.98	1,000
AS-12-1	Emergency Generator Engine #7 (Cold Mill)	Natural Gas Burned	261.5	0.0020	500	0.98	1,000
~~AS-13-1~~	~~Emergency Generator Engine #8 (Coating Line)~~	~~Natural Gas Burned~~	~~304.0~~	~~0.0026~~	~~500~~	~~1.29~~	~~1,000~~
~~AS-14-1~~	~~Emergency Generator Engine #9 (Edge Trimmer)~~	~~Natural Gas Burned~~	~~304.0~~	~~0.0026~~	~~500~~	~~1.29~~	~~1,000~~
AS-29-1	Emergency Generator Engine #10 (Maintenance Bldg)	Natural Gas Burned	304.0	0.0024	500	1.20	1,000
AS-30-1	Emergency Generator Engine #11 (Decoater #1)	Natural Gas Burned	63.9	4.24E-04	500	0.21	1,000
AS-31-1	Emergency Generator Engine #12 (Decoater #2)	Natural Gas Burned	63.9	4.24E-04	500	0.21	1,000
AS-32-1	Emergency Generator Engine #13 (Decoater #3)	Natural Gas Burned	63.9	4.24E-04	500	0.21	1,000

28.2 Rich/Lean Burn Engine Determination

> Emissions for natural gas/propane-fired engines are directly linked to the air-to-fuel ratio and as such, emission factors in AP-42 are delineated into separate tables for rich and lean burn engines. The air-to-fuel ratio is calculated below to determine which of these emission factor sets are more appropriate.

28.2.1 Emergency Generator Engine #1 (Security Office), #2 (Admin), #10 (Maintenance Bldg) - AS-06, 07, 29

Parameter	Value		Basis
Combustion Air in cfh	24,000	cfh	Manufacturer Specification Sheet
Density of Air in lb/cf:	0.076	lb/cf	At sea level at 15 C (60 F)
Fuel consumption rate in cfh (100% load):	2,398	cfh	Manufacturer Specification Sheet
Density of Natural Gas in lb/cf:	0.042	lb/cf	AP-42 Appendix A, Misc. Data and Conversion Factors
Operating Air-to-Fuel Ratio (AFR):	18.10	--	= (24,000 cfh * 0.076 lb/cf) / (2,398 cfh * 0.042 lb/cf)
Stoichiometric AFR:	14.5	--	John B. Heywood: "Internal Combustion Engine Fundamentals page 915", 1988
AFR Ratio	1.25	--	= (18.10 / 14.5)

28.2.2 Emergency Generator Engine #5 (Hot Reversing Mill) - AS-10

Parameter	Value		Basis
Combustion Air in cfh	15,720	cfh	Manufacturer Specification Sheet
Density of Air in lb/cf:	0.076	lb/cf	At sea level at 15 C (60 F)
Fuel consumption rate in cfh (100% load):	1,389	cfh	Manufacturer Specification Sheet
Density of Natural Gas in lb/cf:	0.042	lb/cf	AP-42 Appendix A, Misc. Data and Conversion Factors
Operating Air-to-Fuel Ratio (AFR):	20.47	--	= (15,720 cfh * 0.076 lb/cf) / (1,389 cfh * 0.042 lb/cf)
Stoichiometric AFR:	14.5	--	John B. Heywood: "Internal Combustion Engine Fundamentals page 915", 1988
AFR Ratio	1.41	--	= (20.47 / 14.5)

28.2.3 Emergency Generator Engine #6 (Hot Finishing Mill) - AS-11

Parameter	Value		Basis
Combustion Air in cfh	21,876	cfh	Manufacturer Specification Sheet
Density of Air in lb/cf:	0.076	lb/cf	At sea level at 15 C (60 F)
Fuel consumption rate in cfh (100% load):	1,965	cfh	Manufacturer Specification Sheet
Density of Natural Gas in lb/cf:	0.042	lb/cf	AP-42 Appendix A, Misc. Data and Conversion Factors
Operating Air-to-Fuel Ratio (AFR):	20.14	--	= (21,876 cfh * 0.076 lb/cf) / (1,965 cfh * 0.042 lb/cf)
Stoichiometric AFR:	14.5	--	John B. Heywood: "Internal Combustion Engine Fundamentals page 915", 1988
AFR Ratio	1.39	--	= (20.14 / 14.5)

28.2.4 Emergency Generator Engine #7 (Cold Mill) - AS-12

Parameter	Value		Basis
Combustion Air in cfh	21,876	cfh	Manufacturer Specification Sheet
Density of Air in lb/cf:	0.076	lb/cf	At sea level at 15 C (60 F)
Fuel consumption rate in cfh (100% load):	1,965	cfh	Manufacturer Specification Sheet
Density of Natural Gas in lb/cf:	0.042	lb/cf	AP-42 Appendix A, Misc. Data and Conversion Factors
Operating Air-to-Fuel Ratio (AFR):	20.14	--	= (21,876 cfh * 0.076 lb/cf) / (1,965 cfh * 0.042 lb/cf)
Stoichiometric AFR:	14.5	--	John B. Heywood: "Internal Combustion Engine Fundamentals page 915", 1988
AFR Ratio	1.39	--	= (20.14 / 14.5)

28.2.5 Emergency Generator Engines #11 (Decoater #1), #12 (Decoater #2), #13 (Decoater #3) - AS-30, 31, 32

Parameter	Value		Basis
Combustion Air in cfh	3,420	cfh	Manufacturer Specification Sheet
Density of Air in lb/cf:	0.076	lb/cf	At sea level at 15 C (60 F)
Fuel consumption rate in cfh (100% load):	424	cfh	Manufacturer Specification Sheet
Density of Natural Gas in lb/cf:	0.042	lb/cf	AP-42 Appendix A, Misc. Data and Conversion Factors
Operating Air-to-Fuel Ratio (AFR):	14.59	--	= (3,420 cfh * 0.076 lb/cf) / (424 cfh * 0.042 lb/cf)
Stoichiometric AFR:	14.5	--	John B. Heywood: "Internal Combustion Engine Fundamentals page 915", 1988
AFR Ratio	1.01	--	= (14.59 / 14.5)

> According to 40 CFR 60.4248, rich-burn engines are defined as any four-stroke spark ignited engine where the operating air/fuel ratio divided by the stoichiometric air/fuel ratio at full load conditions is less than or equal to 1.1. Lean-burn engines are defined as any two-stroke or four-stroke spark ignited engine that does not meet the definition of a rich burn engine. Therefore, the engines integral to these generator sets are classified as a lean burn engines for all units but Emergency Generator Engines #11-#13 (Decoaters #1-#3) which are classified as rich burn when combusting natural gas fuel. The emission factors from AP-42 Table 3.2-2 apply to lean burn engines, and the emission factors from AP-42 Table 3.2-3 apply for rich burn engines.

28.3 Emission Factors for Criteria Pollutants from Natural Gas Combustion

> Potential emissions of CO, NOX, and HC/VOC are based on the manufacturer's emissions-related specification sheet associated with the emergency generator engine. Potential SO2 and PM/PM10/PM2.5emissions are based on AP-42 Section 3.2-2. Potential PM10 and PM2.5 emissions are conservatively assumed to be equivalent to emissions of PM.

28.3.1 CO Emission Factor

Emission Unit ID	Parameter	Value		Basis
Emergency Generator Engine #1 (Security Office) (AS-06-1)	CO Emission Factor (Power Output Basis)	0.30	g/hp-hr	Manufacturer's emissions-related specification sheet
		6.58E-04	lb/hp-hr	= 0.30 g/hp-hr x 1 lb/453.59 g
	CO Emission Factor (Fuel Usage Basis)	83.37	lb/MMscf	= 6.58E-04 lb/hp-hr x 304 hp / 0.0024 MMscf/hr
Emergency Generator Engine #2 (Admin. Building) (AS-07-1)	CO Emission Factor (Power Output Basis)	0.30	g/hp-hr	Manufacturer's emissions-related specification sheet
		6.58E-04	lb/hp-hr	= 0.30 g/hp-hr x 1 lb/453.59 g
	CO Emission Factor (Fuel Usage Basis)	83.37	lb/MMscf	= 6.58E-04 lb/hp-hr x 304 hp / 0.0024 MMscf/hr
Emergency Generator Engine #5 (Hot Reversing Mill) (AS-10-1)	CO Emission Factor (Power Output Basis)	4.00	g/hp-hr	NSPS Subpart JJJJ emissions standard
		8.82E-03	lb/hp-hr	= 4.00 g/hp-hr x 1 lb/453.59 g
	CO Emission Factor (Fuel Usage Basis)	1,021.53	lb/MMscf	= 8.82E-03 lb/hp-hr x 160.9 hp / 0.0014 MMscf/hr
Emergency Generator Engine #6 (Hot Finishing Mill) (AS-11-1)	CO Emission Factor (Power Output Basis)	4.00	g/hp-hr	NSPS Subpart JJJJ emissions standard
		8.82E-03	lb/hp-hr	= 4.00 g/hp-hr x 1 lb/453.59 g
	CO Emission Factor (Fuel Usage Basis)	1,173.56	lb/MMscf	= 8.82E-03 lb/hp-hr x 261.5 hp / 0.0020 MMscf/hr
Emergency Generator Engine #7 (Cold Mill) (AS-12-1)	CO Emission Factor (Power Output Basis)	4.00	g/hp-hr	NSPS Subpart JJJJ emissions standard
		8.82E-03	lb/hp-hr	= 4.00 g/hp-hr x 1 lb/453.59 g
	CO Emission Factor (Fuel Usage Basis)	1,173.56	lb/MMscf	= 8.82E-03 lb/hp-hr x 261.5 hp / 0.0020 MMscf/hr
Emergency Generator Engine #10 (Maintenance Bldg) (AS-29-1)	CO Emission Factor (Power Output Basis)	0.30	g/hp-hr	Manufacturer's emissions-related specification sheet
		6.58E-04	lb/hp-hr	= 0.30 g/hp-hr x 1 lb/453.59 g
	CO Emission Factor (Fuel Usage Basis)	83.37	lb/MMscf	= 6.58E-04 lb/hp-hr x 304 hp / 0.0024 MMscf/hr

Emergency Generator Engine #11 (Decoater #1) (AS-30-1)	CO Emission Factor (Power Output Basis)	73.08	g/hp-hr	Manufacturer's emissions-related specification sheet
		0.16	lb/hp-hr	= 73.08 g/hp-hr x 1 lb/453.59 g
	CO Emission Factor (Fuel Usage Basis)	24,281.13	lb/MMscf	= 1.61E-01 lb/hp-hr x 63.9 hp / 4.24E-04 MMscf/hr
Emergency Generator Engine #12 (Decoater #2) (AS-31-1)	CO Emission Factor (Power Output Basis)	73.08	g/hp-hr	Manufacturer's emissions-related specification sheet
		1.61E-01	lb/hp-hr	= 73.08 g/hp-hr x 1 lb/453.59 g
	CO Emission Factor (Fuel Usage Basis)	24,281.13	lb/MMscf	= 1.61E-01 lb/hp-hr x 63.9 hp / 4.24E-04 MMscf/hr
Emergency Generator Engine #13 (Decoater #3) (AS-32-1)	CO Emission Factor (Power Output Basis)	73.08	g/hp-hr	Manufacturer's emissions-related specification sheet
		1.61E-01	lb/hp-hr	= 73.08 g/hp-hr x 1 lb/453.59 g
	CO Emission Factor (Fuel Usage Basis)	24,281.13	lb/MMscf	= 1.61E-01 lb/hp-hr x 63.9 hp / 4.24E-04 MMscf/hr

28.3.2 NOX Emission Factor

Emission Unit ID	Parameter	Value		Basis
Emergency Generator Engine #1 (Security Office) (AS-06-1)	NOX Emission Factor (Power Output Basis)	0.15	g/hp-hr	Manufacturer's emissions-related specification sheet
		3.29E-04	lb/hp-hr	= 0.15 g/hp-hr x 1 lb/453.59 g
	NOX Emission Factor (Fuel Usage Basis)	41.68	lb/MMscf	= 3.29E-04 lb/hp-hr x 304 hp / 0.0024 MMscf/hr
Emergency Generator Engine #2 (Admin. Building) (AS-07-1)	NOX Emission Factor (Power Output Basis)	0.15	g/hp-hr	Manufacturer's emissions-related specification sheet
		3.29E-04	lb/hp-hr	= 0.15 g/hp-hr x 1 lb/453.59 g
	NOX Emission Factor (Fuel Usage Basis)	41.68	lb/MMscf	= 3.29E-04 lb/hp-hr x 304 hp / 0.0024 MMscf/hr
Emergency Generator Engine #5 (Hot Reversing Mill) (AS-10-1)	NOX Emission Factor (Power Output Basis)	2.00	g/hp-hr	NSPS Subpart JJJJ emissions standard
		4.41E-03	lb/hp-hr	= 2.00 g/hp-hr x 1 lb/453.59 g
	NOX Emission Factor (Fuel Usage Basis)	510.76	lb/MMscf	= 4.41E-03 lb/hp-hr x 160.9 hp / 0.0014 MMscf/hr

Emergency Generator Engine #6 (Hot Finishing Mill) (AS-11-1)	NOX Emission Factor (Power Output Basis)	2.00	g/hp-hr	NSPS Subpart JJJJ emissions standard
		4.41E-03	lb/hp-hr	= 2.00 g/hp-hr x 1 lb/453.59 g
	NOX Emission Factor (Fuel Usage Basis)	586.78	lb/MMscf	= 4.41E-03 lb/hp-hr x 261.5 hp / 0.0020 MMscf/hr
Emergency Generator Engine #7 (Cold Mill) (AS-12-1)	NOX Emission Factor (Power Output Basis)	2.00	g/hp-hr	NSPS Subpart JJJJ emissions standard
		4.41E-03	lb/hp-hr	= 2.00 g/hp-hr x 1 lb/453.59 g
	NOX Emission Factor (Fuel Usage Basis)	586.78	lb/MMscf	= 4.41E-03 lb/hp-hr x 261.5 hp / 0.0020 MMscf/hr
Emergency Generator Engine #10 (Maintenance Bldg) (AS-29-1)	NOX Emission Factor (Power Output Basis)	0.15	g/hp-hr	Manufacturer's emissions-related specification sheet
		3.29E-04	lb/hp-hr	= 0.15 g/hp-hr x 1 lb/453.59 g
	NOX Emission Factor (Fuel Usage Basis)	41.68	lb/MMscf	= 3.29E-04 lb/hp-hr x 304 hp / 0.0024 MMscf/hr
Emergency Generator Engine #11 (Decoater #1) (AS-30-1)	NOX Emission Factor (Power Output Basis)	1.72	g/hp-hr	Manufacturer's emissions-related specification sheet
		3.78E-03	lb/hp-hr	= 1.72 g/hp-hr x 1 lb/453.59 g
	NOX Emission Factor (Fuel Usage Basis)	569.86	lb/MMscf	= 3.78E-03 lb/hp-hr x 63.9 hp / 4.24E-04 MMscf/hr
Emergency Generator Engine #12 (Decoater #2) (AS-31-1)	NOX Emission Factor (Power Output Basis)	1.72	g/hp-hr	Manufacturer's emissions-related specification sheet
		3.78E-03	lb/hp-hr	= 1.72 g/hp-hr x 1 lb/453.59 g
	NOX Emission Factor (Fuel Usage Basis)	569.86	lb/MMscf	= 3.78E-03 lb/hp-hr x 63.9 hp / 4.24E-04 MMscf/hr
Emergency Generator Engine #13 (Decoater #3) (AS-32-1)	NOX Emission Factor (Power Output Basis)	1.72	g/hp-hr	Manufacturer's emissions-related specification sheet
		3.78E-03	lb/hp-hr	= 1.72 g/hp-hr x 1 lb/453.59 g
	NOX Emission Factor (Fuel Usage Basis)	569.86	lb/MMscf	= 3.78E-03 lb/hp-hr x 63.9 hp / 4.24E-04 MMscf/hr

28.3.3 VOC Emission Factor

Emission Unit ID	Parameter	Value		Basis
Emergency Generator Engine #1 (Security Office) (AS-06-1)	VOC Emission Factor (Power Output Basis)	0.02	g/hp-hr	Manufacturer's emissions-related specification sheet. Conservatively assume all THC is VOC.
		4.93E-05	lb/hp-hr	= 0.02 g/hp-hr x 1 lb/453.59 g
	VOC Emission Factor (Fuel Usage Basis)	6.25	lb/MMscf	= 4.93E-05 lb/hp-hr x 304 hp / 0.0024 MMscf/hr
Emergency Generator Engine #2 (Admin. Building) (AS-07-1)	VOC Emission Factor (Power Output Basis)	0.02	g/hp-hr	Manufacturer's emissions-related specification sheet
		4.93E-05	lb/hp-hr	= 0.02 g/hp-hr x 1 lb/453.59 g
	VOC Emission Factor (Fuel Usage Basis)	6.25	lb/MMscf	= 4.93E-05 lb/hp-hr x 304 hp / 0.0024 MMscf/hr
Emergency Generator Engine #5 (Hot Reversing Mill) (AS-10-1)	VOC Emission Factor (Power Output Basis)	1.00	g/hp-hr	NSPS Subpart JJJJ emissions standard
		2.20E-03	lb/hp-hr	= 1.00 g/hp-hr x 1 lb/453.59 g
	VOC Emission Factor (Fuel Usage Basis)	255.38	lb/MMscf	= 2.20E-03 lb/hp-hr x 160.9 hp / 0.0014 MMscf/hr
Emergency Generator Engine #6 (Hot Finishing Mill) (AS-11-1)	VOC Emission Factor (Power Output Basis)	1.00	g/hp-hr	NSPS Subpart JJJJ emissions standard
		2.20E-03	lb/hp-hr	= 1.00 g/hp-hr x 1 lb/453.59 g
	VOC Emission Factor (Fuel Usage Basis)	293.39	lb/MMscf	= 2.20E-03 lb/hp-hr x 261.5 hp / 0.0020 MMscf/hr
Emergency Generator Engine #7 (Cold Mill) (AS-12-1)	VOC Emission Factor (Power Output Basis)	1.00	g/hp-hr	NSPS Subpart JJJJ emissions standard
		2.20E-03	lb/hp-hr	= 1.00 g/hp-hr x 1 lb/453.59 g
	VOC Emission Factor (Fuel Usage Basis)	293.39	lb/MMscf	= 2.20E-03 lb/hp-hr x 261.5 hp / 0.0020 MMscf/hr
Emergency Generator Engine #10 (Maintenance Bldg) (AS-29-1)	**VOC Emission Factor (Power Output Basis)**	**0.02**	**g/hp-hr**	**Manufacturer's emissions-related specification sheet**
		4.93E-05	**lb/hp-hr**	**= 0.02 g/hp-hr x 1 lb/453.59 g**
	VOC Emission Factor (Fuel Usage Basis)	**6.25**	**lb/MMscf**	**= 4.93E-05 lb/hp-hr x 304 hp / 0.0024 MMscf/hr**
Emergency Generator Engine #11 (Decoater #1) (AS-30-1)	**VOC Emission Factor (Power Output Basis)**	**0.60**	**g/hp-hr**	**Manufacturer's emissions-related specification sheet**
		1.32E-03	**lb/hp-hr**	**= 0.60 g/hp-hr x 1 lb/453.59 g**
	VOC Emission Factor (Fuel Usage Basis)	**198.21**	**lb/MMscf**	**= 1.32E-03 lb/hp-hr x 63.9 hp / 0.0004 MMscf/hr**

Emergency Generator Engine #12 (Decoater #2) (AS-31-1)	VOC Emission Factor (Power Output Basis)	0.60	g/hp-hr	Manufacturer's emissions-related specification sheet
		1.32E-03	lb/hp-hr	= 0.60 g/hp-hr x 1 lb/453.59 g
	VOC Emission Factor (Fuel Usage Basis)	198.21	lb/MMscf	= 1.32E-03 lb/hp-hr x 63.9 hp / 0.0004 MMscf/hr
Emergency Generator Engine #13 (Decoater #3) (AS-32-1)	VOC Emission Factor (Power Output Basis)	0.60	g/hp-hr	Manufacturer's emissions-related specification sheet
		1.32E-03	lb/hp-hr	= 0.60 g/hp-hr x 1 lb/453.59 g
	VOC Emission Factor (Fuel Usage Basis)	198.21	lb/MMscf	= 1.32E-03 lb/hp-hr x 63.9 hp / 0.0004 MMscf/hr

28.3.4 SO2 Emission Factor

Parameter	Value		Basis
SO2 Emission Factor	5.88E-04	lb/MMBtu	AP-42 Tables 3.2-2 and 3.2-3, 10/24
SO2 Emission Factor (Fuel Usage Basis)	0.59	lb/MMscf	= 5.88E-04 lb/MMBtu x 1000 Btu/scf

28.3.5 PM/PM10/PM2.5 Emission Factor

Parameter	Value		Basis
PM/PM10/PM2.5 Emission Factor - Lean Burn	9.99E-03	lb/MMBtu	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
PM/PM10/PM2.5 Emission Factor- Lean Burn (Fuel Usage Basis)	9.987	lb/MMscf	= 9.99E-03 lb/MMBtu x 1000 Btu/scf
PM/PM10/PM2.5 Emission Factor - Rich Burn	1.94E-02	lb/MMBtu	AP-42 Table 3.2-3, 10/24 (filterable PM + condensable PM)
PM/PM10/PM2.5 Emission Factor- Rich Burn (Fuel Usage Basis)	19.410	lb/MMscf	= 1.94E-02 lb/MMBtu x 1000 Btu/scf

28.3.6 HAP Emission Factors for Natural Gas Combustion (Rich Burn Engines)

> For trace organic compounds, emission factors are from AP-42 Section 3.2 (7/2000) Table 3.2-3 Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines are used after scaling down to account for lower VOC emissions performance of the proposed generator engines. Each organic HAP emission factor from AP-42 Table 3.2-3 is multiplied by the ratio of the vendor specific VOC emission factor (198.21 lb VOC/MMscf) to the reference VOC emission factor from Table 3.2-3 [obtained from the TOC factor and subtracting out methane and ethane contributions to determine VOC; (0.358 lb TOC/MMBtu - 0.23 lb CH4/MMBtu - 0.0704 lb ethane/MMBtu) x 1,000 Btu/scf = 57.6 lb VOC/MMscf]. For metal compounds, emission factors are based on AP-42 Chapter 1.4 Table 1.4-4 for general natural gas combustion.

Pollutant	CAS #	Emission Factor - Raw Value (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-30-1 to AS-32-1 (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-30-1 to AS-32-1 (lb/MMscf)	Emission Factor Basis
1,1,2,2-Tetrachloroethane	79-34-5	2.53E-05	8.71E-05	0.09	AP-42 Table 3.2-3, 07/2000
1,1,2-Trichloroethane	79-00-5	1.53E-05	5.27E-05	0.05	AP-42 Table 3.2-3, 07/2000
1,3-Butadiene	00106-99-0	6.63E-04	2.28E-03	2.28	AP-42 Table 3.2-3, 07/2000
1,3-Dichloropropene	542-75-6	1.27E-05	4.37E-05	0.04	AP-42 Table 3.2-3, 07/2000
Acetaldehyde	00075-07-0	2.79E-03	9.60E-03	9.60	AP-42 Table 3.2-3, 07/2000
Acrolein	00107-02-8	2.63E-03	9.05E-03	9.05	AP-42 Table 3.2-3, 07/2000
Benzene	00071-43-2	1.58E-03	5.44E-03	5.44	AP-42 Table 3.2-3, 07/2000
Carbon Tetrachloride	56-23-5	1.77E-05	6.09E-05	0.06	AP-42 Table 3.2-3, 07/2000
Chlorobenzene	00108-90-7	1.29E-05	4.44E-05	0.04	AP-42 Table 3.2-3, 07/2000
Chloroform	00067-66-3	1.37E-05	4.71E-05	0.05	AP-42 Table 3.2-3, 07/2000
Ethylbenzene	00100-41-4	2.48E-05	8.53E-05	0.09	AP-42 Table 3.2-3, 07/2000
Ethylene Dibromide	00106-93-4	2.13E-05	7.33E-05	0.07	AP-42 Table 3.2-3, 07/2000
Formaldehyde	00050-00-0	2.05E-02	7.05E-02	70.54	AP-42 Table 3.2-3, 07/2000
Methanol	00067-56-1	3.06E-03	1.05E-02	10.53	AP-42 Table 3.2-3, 07/2000
Methylene Chloride	00075-09-2	4.12E-05	1.42E-04	0.14	AP-42 Table 3.2-3, 07/2000
Naphthalene	00091-20-3	9.71E-05	3.34E-04	0.33	AP-42 Table 3.2-3, 07/2000
PAH	na	1.41E-04	4.85E-04	0.49	AP-42 Table 3.2-3, 07/2000
Styrene	00100-42-5	1.19E-05	4.10E-05	0.04	AP-42 Table 3.2-3, 07/2000
Toluene	00108-88-3	5.58E-04	1.92E-03	1.92	AP-42 Table 3.2-3, 07/2000
Vinyl Chloride	75-01-4	7.18E-06	2.47E-05	0.02	AP-42 Table 3.2-3, 07/2000
Xylene	1330-20-7	1.95E-04	6.71E-04	0.67	AP-42 Table 3.2-3, 07/2000
Arsenic compounds	7440-38-2	--	2.00E-07	2.00E-04	AP-42 Table 1.4-4, 07/1998
Beryllium and compounds	7440-41-7	--	1.20E-08	1.20E-05	AP-42 Table 1.4-4, 07/1998
Cadmium and compounds	7440-43-9	--	1.10E-06	1.10E-03	AP-42 Table 1.4-4, 07/1998
Chromium and compounds	7440-47-3	--	1.40E-06	1.40E-03	AP-42 Table 1.4-4, 07/1998
Cobalt and compounds	7440-48-4	--	8.40E-08	8.40E-05	AP-42 Table 1.4-4, 07/1998
Lead and compounds	7439-92-1	--	5.00E-07	5.00E-04	AP-42 Table 1.4-4, 07/1998
Manganese and compounds	7439-96-5	--	3.80E-07	3.80E-04	AP-42 Table 1.4-4, 07/1998
Mercury and compounds	7439-97-6	--	2.60E-07	2.60E-04	AP-42 Table 1.4-4, 07/1998
Nickel and compounds	7440-02-0	--	2.10E-06	2.10E-03	AP-42 Table 1.4-4, 07/1998

Pollutant	CAS #	Emission Factor - Raw Value (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-30-1 to AS-32-1 (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-30-1 to AS-32-1 (lb/MMscf)	Emission Factor Basis
Selenium and compounds	7782-49-2	--	2.40E-08	2.40E-05	AP-42 Table 1.4-4, 07/1998
Total HAPs		--	0.11	111.56	

28.3.7 HAP Emission Factors for Natural Gas Combustion (Lean Burn Engines)

> For trace organic compounds, emission factors are from AP-42 Section 3.2 (7/2000) Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines are used after scaling down to account for lower VOC emissions performance of the proposed generator engines. Each organic HAP emission factor from AP-42 Table 3.2-2 is multiplied by the ratio of the vendor specific VOC emission factor (6.25 lb VOC/MMscf for AS-06-1, AS-07-1, & AS-29-1 and 255.38 lb VOC/MMscf for AS-10-1, and 293.39 lb VOC/MMscf for AS-11-1 and AS-12-1) to the reference VOC emission factor from Table 3.2-2 [obtained from the TOC factor and subtracting out methane and ethane contributions to determine VOC; (1.47 lb TOC/MMBtu - 1.25 lb CH4/MMBtu -0.105 lb ethane/MMBtu) x 1,000 Btu/scf = 115 lb VOC/MMscf]. For metal compounds, emission factors are based on AP-42 Chapter 1.4 Table 1.4-4 for general natural gas combustion.

Pollutant	CAS #	Emission Factor - Raw Value (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-06-1, AS-07-1, & AS-29-1 (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-06-1, AS-07-1, & AS-29-1 (lb/MMscf)	Emission Factor - Scaled/ Calc. Value for AS-10-1 (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-10-1 (lb/MMscf)	Emission Factor - Scaled/ Calc. Value for AS-11-1 & AS-12-1 (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-11-1 & AS-12-1 (lb/MMscf)	Emission Factor Basis
1,1,2,2-Tetrachloroethane	79-34-5	4.00E-05	2.17E-06	2.17E-03	8.88E-05	8.88E-02	1.02E-04	1.02E-01	AP-42 Table 3.2-2, 10/24
1,1,2-Trichloroethane	79-00-5	3.18E-05	1.73E-06	1.73E-03	7.06E-05	7.06E-02	8.11E-05	8.11E-02	AP-42 Table 3.2-2, 10/24
1,3-Butadiene	106-99-0	2.67E-04	1.45E-05	1.45E-02	5.93E-04	5.93E-01	6.81E-04	6.81E-01	AP-42 Table 3.2-2, 10/24
1,3-Dichloropropene	542-75-6	2.64E-05	1.44E-06	1.44E-03	5.86E-05	5.86E-02	6.74E-05	6.74E-02	AP-42 Table 3.2-2, 10/24
2-Methylnaphthalene	91-57-6	3.32E-05	1.81E-06	1.81E-03	7.37E-05	7.37E-02	8.47E-05	8.47E-02	AP-42 Table 3.2-2, 10/24
2,2,4-Trimethylpentane	540-84-1	2.50E-04	1.36E-05	1.36E-02	5.55E-04	5.55E-01	6.38E-04	6.38E-01	AP-42 Table 3.2-2, 10/24
Acenaphthene	83-32-9	1.25E-06	6.80E-08	6.80E-05	2.78E-06	2.78E-03	3.19E-06	3.19E-03	AP-42 Table 3.2-2, 10/24
Acenaphthylene	208-96-8	5.53E-06	3.01E-07	3.01E-04	1.23E-05	1.23E-02	1.41E-05	1.41E-02	AP-42 Table 3.2-2, 10/24
Acetaldehyde	75-07-0	8.36E-03	4.55E-04	4.55E-01	1.86E-02	1.86E+01	2.13E-02	2.13E+01	AP-42 Table 3.2-2, 10/24
Acrolein	107-02-8	5.14E-03	2.79E-04	2.79E-01	1.14E-02	1.14E+01	1.31E-02	1.31E+01	AP-42 Table 3.2-2, 10/24
Benzene	71-43-2	4.40E-04	2.39E-05	2.39E-02	9.77E-04	9.77E-01	1.12E-03	1.12E+00	AP-42 Table 3.2-2, 10/24
Benzo(b)fluoranthene	205-99-2	1.66E-07	9.03E-09	9.03E-06	3.69E-07	3.69E-04	4.24E-07	4.24E-04	AP-42 Table 3.2-2, 10/24
Benzo(e)pyrene	192-97-2	4.15E-07	2.26E-08	2.26E-05	9.22E-07	9.22E-04	1.06E-06	1.06E-03	AP-42 Table 3.2-2, 10/24
Benzo(g,h,i)perylene	191-24-2	4.14E-07	2.25E-08	2.25E-05	9.19E-07	9.19E-04	1.06E-06	1.06E-03	AP-42 Table 3.2-2, 10/24
Biphenyl	92-52-4	2.12E-04	1.15E-05	1.15E-02	4.71E-04	4.71E-01	5.41E-04	5.41E-01	AP-42 Table 3.2-2, 10/24
Carbon Tetrachloride	56-23-5	3.67E-05	2.00E-06	2.00E-03	8.15E-05	8.15E-02	9.36E-05	9.36E-02	AP-42 Table 3.2-2, 10/24

Pollutant	CAS #	Emission Factor - Raw Value (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-06-1, AS-07-1, & AS-29-1 (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-06-1, AS-07-1, & AS-29-1 (lb/MMscf)	Emission Factor - Scaled/ Calc. Value for AS-10-1 (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-10-1 (lb/MMscf)	Emission Factor - Scaled/ Calc. Value for AS-11-1 & AS-12-1 (lb/MMBtu)	Emission Factor - Scaled/ Calc. Value for AS-11-1 & AS-12-1 (lb/MMscf)	Emission Factor Basis
Chlorobenzene	108-90-7	3.04E-05	1.65E-06	1.65E-03	6.75E-05	6.75E-02	7.76E-05	7.76E-02	AP-42 Table 3.2-2, 10/24
Chloroform	67-66-3	2.85E-05	1.55E-06	1.55E-03	6.33E-05	6.33E-02	7.27E-05	7.27E-02	AP-42 Table 3.2-2, 10/24
Chrysene	218-01-9	6.93E-07	3.77E-08	3.77E-05	1.54E-06	1.54E-03	1.77E-06	1.77E-03	AP-42 Table 3.2-2, 10/24
Ethylbenzene	100-41-4	3.97E-05	2.16E-06	2.16E-03	8.82E-05	8.82E-02	1.01E-04	1.01E-01	AP-42 Table 3.2-2, 10/24
Ethylene Dibromide	106-93-4	4.43E-05	2.41E-06	2.41E-03	9.84E-05	9.84E-02	1.13E-04	1.13E-01	AP-42 Table 3.2-2, 10/24
Fluoranthene	206-44-0	1.11E-06	6.04E-08	6.04E-05	2.46E-06	2.46E-03	2.83E-06	2.83E-03	AP-42 Table 3.2-2, 10/24
Fluorene	86-73-7	5.67E-06	3.08E-07	3.08E-04	1.26E-05	1.26E-02	1.45E-05	1.45E-02	AP-42 Table 3.2-2, 10/24
Formaldehyde	50-00-0	5.28E-02	2.87E-03	2.87E+00	1.17E-01	1.17E+02	1.35E-01	1.35E+02	AP-42 Table 3.2-2, 10/24
Methanol	67-56-1	2.50E-03	1.36E-04	1.36E-01	5.55E-03	5.55E+00	6.38E-03	6.38E+00	AP-42 Table 3.2-2, 10/24
Methylene Chloride	75-09-2	2.00E-05	1.09E-06	1.09E-03	4.44E-05	4.44E-02	5.10E-05	5.10E-02	AP-42 Table 3.2-2, 10/24
n-Hexane	110-54-3	1.11E-03	6.04E-05	6.04E-02	2.46E-03	2.46E+00	2.83E-03	2.83E+00	AP-42 Table 3.2-2, 10/24
Naphthalene	91-20-3	7.44E-05	4.05E-06	4.05E-03	1.65E-04	1.65E-01	1.90E-04	1.90E-01	AP-42 Table 3.2-2, 10/24
PAH	na	2.69E-05	1.46E-06	1.46E-03	5.97E-05	5.97E-02	6.86E-05	6.86E-02	AP-42 Table 3.2-2, 10/24
Phenanthrene	85-01-8	1.04E-05	5.65E-07	5.65E-04	2.31E-05	2.31E-02	2.65E-05	2.65E-02	AP-42 Table 3.2-2, 10/24
Phenol	108-95-2	2.40E-05	1.30E-06	1.30E-03	5.33E-05	5.33E-02	6.12E-05	6.12E-02	AP-42 Table 3.2-2, 10/24
Pyrene	129-00-0	1.36E-06	7.39E-08	7.39E-05	3.02E-06	3.02E-03	3.47E-06	3.47E-03	AP-42 Table 3.2-2, 10/24
Styrene	100-42-5	2.36E-05	1.28E-06	1.28E-03	5.24E-05	5.24E-02	6.02E-05	6.02E-02	AP-42 Table 3.2-2, 10/24
Tetrachloroethene	79-34-5	2.48E-06	1.35E-07	1.35E-04	5.51E-06	5.51E-03	6.33E-06	6.33E-03	AP-42 Table 3.2-2, 10/24
Toluene	108-88-3	4.08E-04	2.22E-05	2.22E-02	9.06E-04	9.06E-01	1.04E-03	1.04E+00	AP-42 Table 3.2-2, 10/24
Vinyl Chloride	75-01-4	1.49E-05	8.10E-07	8.10E-04	3.31E-05	3.31E-02	3.80E-05	3.80E-02	AP-42 Table 3.2-2, 10/24
Xylene	1330-20-7	1.84E-04	1.00E-05	1.00E-02	4.09E-04	4.09E-01	4.69E-04	4.69E-01	AP-42 Table 3.2-2, 10/24
Arsenic compounds	7440-38-2	--	2.00E-07	2.00E-04	2.00E-07	2.00E-04	2.00E-07	2.00E-04	AP-42 Table 1.4-4, 07/1998
Beryllium and compounds	7440-41-7	--	1.20E-08	1.20E-05	1.20E-08	1.20E-05	1.20E-08	1.20E-05	AP-42 Table 1.4-4, 07/1998
Cadmium and compounds	7440-43-9	--	1.10E-06	1.10E-03	1.10E-06	1.10E-03	1.10E-06	1.10E-03	AP-42 Table 1.4-4, 07/1998
Chromium and compounds	7440-47-3	--	1.40E-06	1.40E-03	1.40E-06	1.40E-03	1.40E-06	1.40E-03	AP-42 Table 1.4-4, 07/1998
Cobalt and compounds	7440-48-4	--	8.40E-08	8.40E-05	8.40E-08	8.40E-05	8.40E-08	8.40E-05	AP-42 Table 1.4-4, 07/1998
Lead and compounds	7439-92-1	--	5.00E-07	5.00E-04	5.00E-07	5.00E-04	5.00E-07	5.00E-04	AP-42 Table 1.4-4, 07/1998
Manganese and compounds	7439-96-5	--	3.80E-07	3.80E-04	3.80E-07	3.80E-04	3.80E-07	3.80E-04	AP-42 Table 1.4-4, 07/1998
Mercury and compounds	7439-97-6	--	2.60E-07	2.60E-04	2.60E-07	2.60E-04	2.60E-07	2.60E-04	AP-42 Table 1.4-4, 07/1998
Nickel and compounds	7440-02-0	--	2.10E-06	2.10E-03	2.10E-06	2.10E-03	2.10E-06	2.10E-03	AP-42 Table 1.4-4, 07/1998
Selenium and compounds	7782-49-2	--	2.40E-08	2.40E-05	2.40E-08	2.40E-05	2.40E-08	2.40E-05	AP-42 Table 1.4-4, 07/1998
Total HAPs		--	3.93E-03	3.93	0.16	160.33	0.18	184.19	

28.3.8 GHG Emission Factors for Natural Gas Combustion

> Emission factors for GHGs from natural gas combustion are based on Subpart C of EPA's Mandatory Greenhouse Gas Reporting Rule (MRR, 40 CFR 98 Subpart C Tables C-1 and C-2), as revised on 11/29/2013 (78 FR 71909). **The global warming potential factors for CH4 and N2O are those specified in Subpart A (89 FR 31894, Apr. 25, 2024).**

CO2	53.06 kg/MMBtu	40 CFR 98, Subpart C, Table C-1; Natural Gas (weighted U.S. average)	
	116,976 lb/MMscf	= 53.06 kg/MMBtu x 2.2046 lb/kg x 1,000 Btu/scf	
CH4	1.00E-03 kg/MMBtu	40 CFR 98, Subpart C, Table C-2; Natural Gas	
	2.20 lb/MMscf	= 1.00E-03 kg/MMBtu x 2.2046 lb/kg x 1,000 Btu/scf	
N2O	1.00E-04 kg/MMBtu	40 CFR 98, Subpart C, Table C-2; Natural Gas	
	0.22 lb/MMscf	= 1.00E-04 kg/MMBtu x 2.2046 lb/kg x 1,000 Btu/scf	
CO2e			
CO2e Factor:	**117,096** lb/MMscf	40 CFR 98 Subpart A	

28.4 Emission Factors and Potential Emissions for the Emergency Generator Engines

> The potential emissions for the emergency generator engines are tallied below.

28.4.1 Emergency Generator Engine #1 (Security Office), #2 (Admin), #10 (Maintenance Bldg) - AS-06, 07, 29 Potential Emissions

Pollutant	Emission Factor Value	Units	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate per Engine (lb/hr)	Potential Emission Rate per Engine (tpy)	Total Potential Emission Rate (lb/hr)	Total Potential Emission Rate (tpy)	Emission Factor Basis
PM	9.99	lb/MMscf	2.40E-03	1.20	0.024	5.99E-03	0.072	0.018	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
PM10	9.99	lb/MMscf	2.40E-03	1.20	0.024	5.99E-03	0.072	0.018	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
PM2.5	9.99	lb/MMscf	2.40E-03	1.20	0.024	5.99E-03	0.072	0.018	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
NOX	41.68	lb/MMscf	2.40E-03	1.20	0.10	0.025	0.300	0.075	Vendor estimate
CO	83.37	lb/MMscf	2.40E-03	1.20	0.20	0.050	0.600	0.150	Vendor estimate
SO2	0.59	lb/MMscf	2.40E-03	1.20	1.41E-03	3.53E-04	4.23E-03	1.06E-03	AP-42 Tables 3.2-2, 10/24
VOC	6.25	lb/MMscf	2.40E-03	1.20	0.015	0.004	0.045	0.011	Vendor estimate
CO2	116,976	lb/MMscf	2.40E-03	1.20	280.51	70.13	841.53	210.38	40 CFR 98 Subpart C
CH4	2.20	lb/MMscf	2.40E-03	1.20	5.29E-03	1.32E-03	0.016	3.96E-03	40 CFR 98 Subpart C
N2O	0.22	lb/MMscf	2.40E-03	1.20	5.29E-04	1.32E-04	1.59E-03	3.96E-04	40 CFR 98 Subpart C
CO2e	117,096	lb/MMscf	2.40E-03	1.20	280.80	70.20	842.39	210.60	40 CFR 98 Subpart C
Lead	5.00E-04	lb/MMscf	2.40E-03	1.20	1.20E-06	3.00E-07	3.60E-06	8.99E-07	AP-42 Table 1.4-4
Total HAPs	111.56	lb/MMscf	2.40E-03	1.20	0.27	0.07	0.80	0.20	AP-42 Tables 3.2-2 and 1.4-4

28.4.2 Emergency Generator Engine #5 (Hot Reversing Mill) - AS-10 Potential Emissions

Pollutant	Emission Factor Value	Units	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)	Emission Factor Basis
PM	9.99	lb/MMscf	1.39E-03	0.69	0.014	3.47E-03	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
PM10	9.99	lb/MMscf	1.39E-03	0.69	0.014	3.47E-03	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
PM2.5	9.99	lb/MMscf	1.39E-03	0.69	0.014	3.47E-03	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
NOX	510.76	lb/MMscf	1.39E-03	0.69	0.71	0.18	NSPS Subpart JJJJ Emis. Std.
CO	1,021.53	lb/MMscf	1.39E-03	0.69	1.42	0.35	NSPS Subpart JJJJ Emis. Std.
SO2	0.59	lb/MMscf	1.39E-03	0.69	8.17E-04	2.04E-04	AP-42 Tables 3.2-2, 10/24
VOC	255.38	lb/MMscf	1.39E-03	0.69	0.35	0.089	NSPS Subpart JJJJ Emis. Std.
CO2	116,976	lb/MMscf	1.39E-03	0.69	162.48	40.62	40 CFR 98 Subpart C
CH4	2.20	lb/MMscf	1.39E-03	0.69	3.06E-03	7.66E-04	40 CFR 98 Subpart C
N2O	0.22	lb/MMscf	1.39E-03	0.69	3.06E-04	7.66E-05	40 CFR 98 Subpart C
CO2e	117,096	lb/MMscf	1.39E-03	0.69	162.65	40.66	40 CFR 98 Subpart C
Lead	5.00E-04	lb/MMscf	1.39E-03	0.69	6.95E-07	1.74E-07	AP-42 Table 1.4-4
Total HAPs	111.56	lb/MMscf	1.39E-03	0.69	0.15	0.04	AP-42 Tables 3.2-2 and 1.4-4

28.4.3 Emergency Generator Engine #6 (Hot Finishing Mill) - AS-11 Potential Emissions

Pollutant	Emission Factor Value	Units	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)	Emission Factor Basis
PM	9.99	lb/MMscf	1.97E-03	0.98	1.96E-02	4.91E-03	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
PM10	9.99	lb/MMscf	1.97E-03	0.98	1.96E-02	4.91E-03	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
PM2.5	9.99	lb/MMscf	1.97E-03	0.98	1.96E-02	4.91E-03	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
NOX	586.78	lb/MMscf	1.97E-03	0.98	1.153	2.88E-01	NSPS Subpart JJJJ Emis. Std.
CO	1,173.56	lb/MMscf	1.97E-03	0.98	2.31	0.577	NSPS Subpart JJJJ Emis. Std.
SO2	0.59	lb/MMscf	1.97E-03	0.98	1.16E-03	2.89E-04	AP-42 Tables 3.2-2, 10/24
VOC	293.39	lb/MMscf	1.97E-03	0.98	0.577	0.144	NSPS Subpart JJJJ Emis. Std.
CO2	116,976	lb/MMscf	1.97E-03	0.98	229.86	57.46	40 CFR 98 Subpart C
CH4	2.20	lb/MMscf	1.97E-03	0.98	4.33E-03	1.08E-03	40 CFR 98 Subpart C
N2O	0.22	lb/MMscf	1.97E-03	0.98	4.33E-04	1.08E-04	40 CFR 98 Subpart C
CO2e	117,096	lb/MMscf	1.97E-03	0.98	230.09	57.52	40 CFR 98 Subpart C
Lead	5.00E-04	lb/MMscf	1.97E-03	0.98	9.83E-07	2.46E-07	AP-42 Table 1.4-4
Total HAPs	111.56	lb/MMscf	1.97E-03	0.98	2.19E-01	5.48E-02	AP-42 Tables 3.2-2 and 1.4-4

28.4.4 Emergency Generator Engine #7 (Cold Mill) - AS-12 Potential Emissions

Pollutant	Emission Factor Value	Units	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)	Emission Factor Basis
PM	9.99	lb/MMscf	1.97E-03	0.98	0.020	4.91E-03	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
PM10	9.99	lb/MMscf	1.97E-03	0.98	0.020	4.91E-03	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
PM2.5	9.99	lb/MMscf	1.97E-03	0.98	0.020	4.91E-03	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)
NOX	586.78	lb/MMscf	1.97E-03	0.98	1.153	0.29	NSPS Subpart JJJJ Emis. Std.
CO	1,173.56	lb/MMscf	1.97E-03	0.98	2.31	0.58	NSPS Subpart JJJJ Emis. Std.
SO2	0.59	lb/MMscf	1.97E-03	0.98	1.16E-03	2.89E-04	AP-42 Tables 3.2-2, 10/24
VOC	293.39	lb/MMscf	1.97E-03	0.98	0.58	0.14	NSPS Subpart JJJJ Emis. Std.
CO2	116,976	lb/MMscf	1.97E-03	0.98	229.86	57.46	40 CFR 98 Subpart C
CH4	2.20	lb/MMscf	1.97E-03	0.98	4.33E-03	1.08E-03	40 CFR 98 Subpart C
N2O	0.22	lb/MMscf	1.97E-03	0.98	4.33E-04	1.08E-04	40 CFR 98 Subpart C
CO2e	117,096	lb/MMscf	1.97E-03	0.98	230.09	57.52	40 CFR 98 Subpart C
Lead	5.00E-04	lb/MMscf	1.97E-03	0.98	9.83E-07	2.46E-07	AP-42 Table 1.4-4
Total HAPs	111.56	lb/MMscf	1.97E-03	0.98	0.22	0.05	AP-42 Tables 3.2-2 and 1.4-4

28.4.5 Emergency Generator Engines #11 (Decoater #1), #12 (Decoater #2), #13 (Decoater #3) - AS-30, 31, 32 Potential Emissions

Pollutant	Emission Factor Value	Units	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emission Rate per Engine (lb/hr)	Potential Emission Rate per Engine (tpy)	Total Potential Emission Rate (lb/hr)	Total Potential Emission Rate (tpy)	Emission Factor Basis
PM	19.41	lb/MMscf	4.24E-04	0.21	8.23E-03	2.06E-03	0.025	6.17E-03	AP-42 Table 3.2-3, 10/24 (filterable PM + condensable PM)
PM10	19.41	lb/MMscf	4.24E-04	0.21	8.23E-03	2.06E-03	0.025	6.17E-03	AP-42 Table 3.2-3, 10/24 (filterable PM + condensable PM)
PM2.5	19.41	lb/MMscf	4.24E-04	0.21	8.23E-03	2.06E-03	0.025	6.17E-03	AP-42 Table 3.2-3, 10/24 (filterable PM + condensable PM)
NOX	569.86	lb/MMscf	4.24E-04	0.21	0.24	6.04E-02	0.72	0.18	Vendor estimate
CO	24,281.13	lb/MMscf	4.24E-04	0.21	10.30	2.57	30.89	7.72	Vendor estimate
SO2	0.59	lb/MMscf	4.24E-04	0.21	2.49E-04	6.23E-05	7.48E-04	1.87E-04	AP-42 Tables 3.2-3, 10/24
VOC	198.21	lb/MMscf	4.24E-04	0.21	0.084	0.021	0.25	0.063	Vendor estimate
CO2	116,976	lb/MMscf	4.24E-04	0.21	49.60	12.40	148.79	37.20	40 CFR 98 Subpart C
CH4	2.20	lb/MMscf	4.24E-04	0.21	9.35E-04	2.34E-04	2.80E-03	7.01E-04	40 CFR 98 Subpart C
N2O	0.22	lb/MMscf	4.24E-04	0.21	9.35E-05	2.34E-05	2.80E-04	7.01E-05	40 CFR 98 Subpart C
CO2e	117,096	lb/MMscf	4.24E-04	0.21	49.65	12.41	148.95	37.24	40 CFR 98 Subpart C
Lead	5.00E-04	lb/MMscf	4.24E-04	0.21	2.12E-07	5.30E-08	6.36E-07	1.59E-07	AP-42 Table 1.4-4
Total HAPs	111.56	lb/MMscf	4.24E-04	0.21	4.73E-02	1.18E-02	0.14	0.035	AP-42 Tables 3.2-3 and 1.4-4

28.4.6 Total Emergency Generator Potential Emissions

Pollutant	Total Potential Emission Rate for all Engines (lb/hr)	(tpy)
PM	0.15	0.037
PM10	0.15	0.037
PM2.5	0.15	0.037
NOX	4.04	1.01
CO	37.52	9.38
SO2	0.008	2.03E-03
VOC	1.80	0.45
CO2	1,612.52	403
CH4	0.030	0.008
N2O	3.04E-03	7.60E-04
CO2e	1,614.17	404
Lead	6.89E-06	1.72E-06
Total HAPs	1.54	0.38

29. Fire Pump Engines

> Novelis plans to install two emergency fire water "pump houses" (**North** Pump House and West Pump House), where the pumps in each house are driven diesel engines. **The North Pump House contains one (1) 700 hp diesel-driven fire pump engine, and the West Pump House contains two (2) 510 hp diesel-driven fire pump engines.** These emergency engines are used to power the fire pumps to provide water in the case of a fire. Emissions will exhaust to dedicated, uncontrolled stacks for release to the atmosphere. The potential emission calculations below rely on the manufacturer's emissions-related data where available in place of reference emission factors from AP-42.

29.1 Engine Power and Fuel Consumption Data

Emission Unit ID	Emission Unit Description	Engine Rating (hp)	Hourly Fuel Usage Rate (Mgal/hr)	Annual Operating Hours (hr/yr)	Annual Fuel Usage Rate (Mgal/yr)	Heating Value of Diesel Fuel (Btu/gal)
AS-15-1	**Fire Pump Engine #1 (North Pump House)**	**700.0**	**0.038**	500	**19.00**	138,500
~~AS-16-1~~	~~Fire Pump Engine #2 (South Pump House)~~	~~422.0~~	~~0.020~~	~~500~~	~~10.00~~	~~138,500~~
AS-17-1	Fire Pump Engine #3 (West Pump House)	**510.0**	**0.033**	500	**16.50**	138,500
AS-18-1	Fire Pump Engine #4 (West Pump House)	**510.0**	**0.033**	500	**16.50**	138,500

29.2 Emission Factors for Criteria Pollutants, HAP, and GHG from Diesel Combustion

> Potential emissions of PM, CO, NOX, and HC are based on the manufacturer's emissions-related specification sheet associated with the fire pump engine. Potential PM10 and PM2.5 emissions are conservatively assumed to be equivalent to emissions of PM. To take into account the lower sulfur content of the diesel fuel burned, for purposes of representing potential SO2 emissions from the engines, the factor in AP-42 Table 3.4-1 (Large Stationary Diesel Engines, 10/1996 edition) is used as shown below. This factor expresses SO2 as a function of sulfur content.

> Emission factors for GHGs are estimated using the Distillate Fuel Oil No. 2 emission factors published in 40 CFR 98, Subpart C, Table C-1 & 2.

29.2.1 PM/PM10/PM2.5 Emission Factors

Parameter - Fire Pump Engine #1 (North Pump House) - AS-15	Value		Basis
PM Emission Factor (Power Output Basis)	0.081	g/hp-hr	Manufacturer's emissions-related specification sheet
	1.79E-04	lb/hp-hr	= 0.08 g/hp-hr x 1 lb/453.59 g
PM/PM10/PM2.5 Emission Factor (Fuel Usage Basis)	3.29	lb/Mgal	= 1.79E-04 lb/hp-hr x 700 hp / 0.0380 Mgal/hr; Assume emissions of particulate matter across all size fractions are equivalent.

Parameter - Fire Pump Engine #3 and #4 (West Pump House) - AS-17, 18	Value		Basis
PM Emission Factor (Power Output Basis)	0.067	g/hp-hr	Manufacturer's emissions-related specification sheet
	1.48E-04	lb/hp-hr	= 0.07 g/hp-hr x 1 lb/453.59 g
PM/PM10/PM2.5 Emission Factor (Fuel Usage Basis)	2.28	lb/Mgal	= 1.48E-04 lb/hp-hr x 700 hp / 0.0380 Mgal/hr; Assume emissions of particulate matter across all size fractions are equivalent.

29.2.2 CO Emission Factors

Parameter - Fire Pump Engine #1 (North Pump House) - AS-15	Value		Basis
CO Emission Factor (Power Output Basis)	0.40	g/hp-hr	Manufacturer's emissions-related specification sheet
	8.82E-04	lb/hp-hr	= 0.40 g/hp-hr x 1 lb/453.59 g
CO Emission Factor (Fuel Usage Basis)	16.24	lb/Mgal	= 8.82E-04 lb/hp-hr x 700 hp / 0.0380 Mgal/hr

Parameter - Fire Pump Engine #3 and #4 (West Pump House) - AS-17, 18	Value		Basis
CO Emission Factor (Power Output Basis)	0.34	g/hp-hr	Manufacturer's emissions-related specification sheet
	7.50E-04	lb/hp-hr	= 0.34 g/hp-hr x 1 lb/453.59 g
CO Emission Factor (Fuel Usage Basis)	11.58	lb/Mgal	= 7.50E-04 lb/hp-hr x 700 hp / 0.0380 Mgal/hr

29.2.3 NOX Emission Factors

Parameter - Fire Pump Engine #1 (North Pump House) - AS-15	Value		Basis
NOX Emission Factor (Power Output Basis)	2.68	g/hp-hr	Manufacturer's emissions-related specification sheet
	5.91E-03	lb/hp-hr	= 2.68 g/hp-hr x 1 lb/453.59 g
NOX Emission Factor (Fuel Usage Basis)	108.84	lb/Mgal	= 5.91E-03 lb/hp-hr x 700 hp / 0.0380 Mgal/hr

Parameter - Fire Pump Engine #3 and #4 (West Pump House) - AS-17, 18	Value		Basis
NOX Emission Factor (Power Output Basis)	2.60	g/hp-hr	Manufacturer's emissions-related specification sheet
	5.73E-03	lb/hp-hr	= 2.60 g/hp-hr x 1 lb/453.59 g
NOX Emission Factor (Fuel Usage Basis)	88.59	lb/Mgal	= 5.73E-03 lb/hp-hr x 700 hp / 0.0380 Mgal/hr

29.2.4 VOC Emission Factors

Parameter - Fire Pump Engine #1 (North Pump House) - AS-15	Value		Basis
VOC Emission Factor (Power Output Basis)	0.07	g/hp-hr	Manufacturer's emissions-related specification sheet. Conservatively assume all HC is VOC.
	1.54E-04	lb/hp-hr	= 0.07 g/hp-hr x 1 lb/453.59 g
VOC Emission Factor (Fuel Usage Basis)	2.84	lb/Mgal	= 1.54E-04 lb/hp-hr x 700 hp / 0.0380 Mgal/hr

Parameter - Fire Pump Engine #3 and #4 (West Pump House) - AS-17, 18	Value		Basis
VOC Emission Factor (Power Output Basis)	0.07	g/hp-hr	Manufacturer's emissions-related specification sheet. Conservatively assume all HC is VOC.
	1.54E-04	lb/hp-hr	= 0.07 g/hp-hr x 1 lb/453.59 g
VOC Emission Factor (Fuel Usage Basis)	2.39	lb/Mgal	= 1.54E-04 lb/hp-hr x 700 hp / 0.0380 Mgal/hr

29.2.5 SO2 Emission Factors

Parameter - All Fire Engines #1, #3, #4 - AS-15, 17, 18	Value		Basis
SO2 Emission Factor (Heat Input Basis)	1.01 S	lb/MMBtu	AP-42 Table 3.4-1, 10/1996 (S is sulfur content in %)
	1.52E-03	lb/MMBtu	= 1.01 x 15 ppm x 100 / 1,000,000
SO2 Emission Factor (Fuel Usage Basis)	0.21	lb/Mgal	= 1.52E-03 lb/MMBtu x 138,500 Btu/gal x 1,000 / 1,000,000

29.2.6 HAP Emission Factors for Diesel Combustion

> For trace organic compounds, emission factors for organic HAP compounds expected to be emitted are based on emission factors in AP-42 Table 3.3-2 (4/2025 Edition). For metal compounds, emission factors are based on AP-42 Chapter 1.3 Table 1.3-10 (5/2010 edition) for general diesel fuel combustion. Emission factors are converted from lb/MMBtu as provided in AP-42 to lb/Mgal.

Pollutant	CAS #	Emission Factor (lb/MMBtu)	Emission Factor (lb/Mgal)	Emission Factor Basis
Benzene	00071-43-2	9.33E-04	1.29E-01	AP-42 Table 3.3-2, 4/2025
Toluene	00108-88-3	4.09E-04	5.66E-02	AP-42 Table 3.3-2, 4/2025
Xylenes	01330-20-7	2.85E-04	3.95E-02	AP-42 Table 3.3-2, 4/2025
1,3-Butadiene	00106-99-0	3.91E-05	5.42E-03	AP-42 Table 3.3-2, 4/2025
Formaldehyde	00050-00-0	1.18E-03	1.63E-01	AP-42 Table 3.3-2, 4/2025
Acetaldehyde	00075-07-0	7.67E-04	1.06E-01	AP-42 Table 3.3-2, 4/2025
Acrolein	00107-02-8	9.25E-05	1.28E-02	AP-42 Table 3.3-2, 4/2025
Naphthalene	00091-20-3	8.48E-05	1.17E-02	AP-42 Table 3.3-2, 4/2025
PAH	na	1.68E-04	2.33E-02	AP-42 Table 3.3-2, 4/2025
Arsenic compounds	7440-38-2	4.00E-06	5.54E-04	AP-42 Table 1.3-10, 5/2010
Beryllium and compounds	7440-41-7	3.00E-06	4.16E-04	AP-42 Table 1.3-10, 5/2010
Cadmium and compounds	7440-43-9	3.00E-06	4.16E-04	AP-42 Table 1.3-10, 5/2010
Chromium and compounds	7440-47-3	3.00E-06	4.16E-04	AP-42 Table 1.3-10, 5/2010
Lead and compounds	7439-92-1	9.00E-06	1.25E-03	AP-42 Table 1.3-10, 5/2010
Manganese and compounds	7439-96-5	6.00E-06	8.31E-04	AP-42 Table 1.3-10, 5/2010
Mercury and compounds	7439-97-6	3.00E-06	4.16E-04	AP-42 Table 1.3-10, 5/2010
Nickel and compounds	7440-02-0	3.00E-06	4.16E-04	AP-42 Table 1.3-10, 5/2010
Selenium and compounds	7782-49-2	1.50E-06	2.08E-04	AP-42 Table 1.3-10, 5/2010
Total HAPs		3.99E-03	5.53E-01	

29.2.7 GHG Emission Factors for Diesel Combustion

> Emission factors for GHGs from diesel fuel combustion are based on Subpart C of EPA's Mandatory Greenhouse Gas Reporting Rule (MRR, 40 CFR 98 Subpart C Tables C-1 and C-2), as revised on 11/29/2013 (78 FR 71909). **The global warming potential factors for CH4 and N2O are those specified in Subpart A (89 FR 31894, Apr. 25, 2024).**

CO2	73.96	kg/MMBtu	40 CFR 98 Subpart C, Table C-1 for Distillate Fuel Oil No. 2
	22,583	lb/Mgal	= 73.96 kg/MMBtu x 2.2046 lb/kg x 138.50 MMBtu/Mgal
CH4	3.00E-03	kg/MMBtu	40 CFR 98 Subpart C, Table C-2 for Petroleum
	0.92	lb/Mgal	= 3.00E-03 kg/MMBtu x 2.2046 lb/kg x 138.50 MMBtu/Mgal
N2O	6.00E-04	kg/MMBtu	40 CFR 98 Subpart C, Table C-2 for Petroleum
	0.18	lb/Mgal	= 6.00E-04 kg/MMBtu x 2.2046 lb/kg x 138.50 MMBtu/Mgal
CO2e			
CO2e Factor:	22,657	lb/Mgal	40 CFR 98 Subpart A

29.3 Emission Factors and Potential Emissions for the Fire Pump Engines

> The potential emissions for the fire pump emergency generator engines is tallied below.

29.3.1 Fire Pump Engine #1 (North Pump House) - AS-15 Potential Emissions

Pollutant	Emission Factor Value	Units	Maximum Hourly Process Rate (Mgalhr)	Maximum Annual Process Rate (Mgal/yr)	Potential Emission Rate (lb/hr)	(tpy)	Emission Factor Basis
PM	3.29	lb/Mgal	0.038	19.00	0.13	0.031	Vendor estimate
PM10	3.29	lb/Mgal	0.038	19.00	0.13	0.031	Vendor estimate
PM2.5	3.29	lb/Mgal	0.038	19.00	0.13	0.031	Vendor estimate
NOX	108.84	lb/Mgal	0.038	19.00	4.14	1.03	Vendor estimate
CO	16.24	lb/Mgal	0.038	19.00	0.62	0.15	Vendor estimate
SO2	0.21	lb/Mgal	0.038	19.00	7.97E-03	1.99E-03	AP-42 Table 3.4-1
VOC	2.84	lb/Mgal	0.038	19.00	0.108	0.027	Vendor estimate
CO2	22,583	lb/Mgal	0.038	19.00	858	215	40 CFR 98 Subpart C
CH4	0.92	lb/Mgal	0.038	19.00	0.035	8.70E-03	40 CFR 98 Subpart C
N2O	0.18	lb/Mgal	0.038	19.00	6.96E-03	1.74E-03	40 CFR 98 Subpart C
CO2e	22,657	lb/Mgal	0.038	19.00	861	215	40 CFR 98 Subpart C
Lead	1.25E-03	lb/Mgal	0.038	19.00	4.74E-05	1.18E-05	AP-42 Table 1.3-10
Total HAPs	5.53E-01	lb/Mgal	0.038	19.00	0.021	5.25E-03	AP-42 Tables 3.3-2 & 1.3-10

29.3.2 Fire Pump Engine #3 and #4 (West Pump House) - AS-17, 18 Potential Emissions

Pollutant	Emission Factor Value	Units	Maximum Hourly Process Rate (Mgalhr)	Maximum Annual Process Rate (Mgal/yr)	Potential Emission Rate (lb/hr)	(tpy)	Total Potential Emission Rate (lb/hr)	(tpy)	Emission Factor Basis
PM	2.28	lb/Mgal	0.033	16.50	0.075	0.019	0.15	0.038	Vendor estimate
PM10	2.28	lb/Mgal	0.033	16.50	0.075	0.019	0.15	0.038	Vendor estimate
PM2.5	2.28	lb/Mgal	0.033	16.50	0.075	0.019	0.15	0.038	Vendor estimate
NOX	88.59	lb/Mgal	0.033	16.50	2.92	0.73	5.85	1.46	Vendor estimate
CO	11.58	lb/Mgal	0.033	16.50	0.38	0.10	0.76	0.19	Vendor estimate
SO2	0.21	lb/Mgal	0.033	16.50	6.92E-03	1.73E-03	0.014	3.46E-03	AP-42 Table 3.4-1
VOC	2.39	lb/Mgal	0.033	16.50	0.079	0.020	0.16	0.039	Vendor estimate
CO2	22,583	lb/Mgal	0.033	16.50	745	186	1,490	373	40 CFR 98 Subpart C
CH4	0.92	lb/Mgal	0.033	16.50	0.030	7.56E-03	0.060	0.015	40 CFR 98 Subpart C
N2O	0.18	lb/Mgal	0.033	16.50	6.05E-03	1.51E-03	0.012	3.02E-03	40 CFR 98 Subpart C
CO2e	22,657	lb/Mgal	0.033	16.50	748	187	1,495	374	40 CFR 98 Subpart C
Lead	1.25E-03	lb/Mgal	0.033	16.50	4.11E-05	1.03E-05	8.23E-05	2.06E-05	AP-42 Table 1.3-10
Total HAPs	5.53E-01	lb/Mgal	0.033	16.50	0.018	4.56E-03	0.037	9.13E-03	AP-42 Tables 3.3-2 & 1.3-10

29.3.3 Total Fire Pump Engine Potential Emissions

Pollutant	Total Potential Emission Rate for All Engines (lb/hr)	(tpy)
PM	0.28	0.069
PM10	0.28	0.069
PM2.5	0.28	0.069
NOX	9.98	2.50
CO	1.38	0.35
SO2	2.18E-02	5.46E-03
VOC	0.27	0.066
CO2	2,349	587
CH4	0.10	0.024
N2O	1.91E-02	4.76E-03
CO2e	2,356	589
Lead	1.30E-04	3.24E-05
Total HAPs	5.75E-02	0.014

30. Building Heating Systems

> The proposed project includes a total of approximately **66** building heating units spread across various buildings/process areas. **The maximum hourly heat input rating of each heating unit ranges from 0.045 to 11.55 MMBtu/hr with the higher heat input rating units (>2 MMBtu/hr) serving as make up air units (MAU) for the main production buildings and the lower heat input rating units (<0.2 MMBtu/hr) serving as unit heaters in the central maintenance building.** All building heating systems will be **direct-fired** and will vent inside the building with no direct discharge to the atmosphere.

30.1 Building Heating Systems Natural Gas Usage Rate

> The maximum hourly emissions from the units are a function of the maximum gas usage, which is based on the heat input capacity of its burner and the heating value of the gas consumed at the plant.

Emission Unit ID	Emission Unit Description	Process Description	Number of Units	Individual Unit Heat Input Rating (MMBtu/hr)	Individual Unit Hourly Fuel Usage Capacity (MMscf/hr)	Individual Unit Max. Daily Avg. Fuel Usage Rate[1] (MMscf/hr)	Individual Unit Annual Fuel Usage Rate (MMscf/yr)[2]	Heating Value of Natural Gas (Btu/scf)
AS-19a-1	Building Heating Systems (30 MAU @ 11.55 MMBtu/hr Each)	Natural Gas Usage	30	11.55	1.16E-02	4.95E-03	14.41	1,000
AS-19b-1	Building Heating Systems (4 MAU @ 7.50 MMBtu/hr Each)	Natural Gas Usage	4	7.50	7.50E-03	2.97E-03	9.36	1,000
AS-19c-1	Building Heating Systems (2 MAU @ 3.75 MMBtu/hr Each)	Natural Gas Usage	2	3.75	3.75E-03	1.48E-03	4.68	1,000
AS-19d-1	Building Heating Systems (1 MAU @ 2.25 MMBtu/hr Each)	Natural Gas Usage	1	2.25	2.25E-03	1.06E-03	2.81	1,000
AS-19e-1	Building Heating Systems (7 @ 0.175 MMBtu/hr Each)	Natural Gas Usage	7	0.175	1.75E-04	1.75E-04	0.22	1,000
AS-19f-1	Building Heating Systems (12 @ 0.150 MMBtu/hr Each)	Natural Gas Usage	12	0.150	1.50E-04	1.50E-04	0.19	1,000
AS-19g-1	Building Heating Systems (6 @ 0.105 MMBtu/hr Each)	Natural Gas Usage	6	0.105	1.05E-04	1.05E-04	0.13	1,000
AS-19h-1	Building Heating Systems (4 @ 0.045 MMBtu/hr Each)	Natural Gas Usage	4	0.045	4.50E-05	4.50E-05	0.06	1,000

[1] Maximum daily average natural gas usage rate for primary make up air units (MAU) (AS-19a to AS-19d) determined from a wintertime heating day with 27 deg. F ambient temperature and 55 deg. F heated air discharge temperature into the main production buildings used as the engineering design basis. The daily natural gas usage is determined from the air flow capacity of the unit, air temperature rise associated with design conditions, heat capacity of air, density of air, and thermal efficiency of the selected MAU.

[2] Novelis is proposing to established an annual natural gas usage limitation for the grouping of all building heating system equivalent to the maximum annual potential natural gas usage for the as-permitted configuration of this emission unit grouping from the initial Novelis Bay Minette PSD permit action (refer to Section 28.1 of Appendix C to the final November 2022 version of the initial PSD permit application).

Parameter	Value	Units	Basis
Total Heat Input Capacity:	390.1	MMBtu/hr	Design specification
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Gas Usage Capacity:	0.390	MMscf/hr	= 390.09 MMBtu/hr / 1,000 Btu/scf
Maximum Daily Average Gas Usage Rate:	0.168	MMscf/hr	= 168.15 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Gas Usage Rate:	486.7	MMscf/yr	Proposed annual operating limit based on original PSD permit basis for Building Heating Systems

30.2 Potential Emission Calculations for Building Heating Systems

> Refer to Section 9.2.3 for the PM10 and PM2.5 emission factor derivation. All other emission factors are based on reference literature (e.g., EPA's AP-42 and 40 CFR 98).

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Hourly Process Rate (MMscf/hr)	Maximum Annual Process Rate (MMscf/yr)	Potential Emissions (lb/hr)	(tpy)
NOX	100.0	AP-42 Table 1.4-1	0.390	486.7	39.01	24.33
CO	84.0	AP-42 Table 1.4-1	0.390	486.7	32.77	20.44
PM	1.9	AP-42 Table 1.4-2	0.390	486.7	0.74	0.46
PM10	3.5	AP-42 Table 1.4-2 + EPA Speciate DB	0.390	486.7	1.35	0.84
PM2.5	3.5	AP-42 Table 1.4-2 + EPA Speciate DB	0.390	486.7	1.35	0.84
VOC	5.5	AP-42 Table 1.4-2	0.390	486.7	2.15	1.34
SO2	0.6	AP-42 Table 1.4-2	0.390	486.7	0.234	0.15
CO2	116,977	40 CFR 98 Subpart C, Table C-1	0.390	486.7	45,631	28,464
CH4	2.20	40 CFR 98 Subpart C, Table C-2	0.390	486.7	0.86	0.54
N2O	0.22	40 CFR 98 Subpart C, Table C-2	0.390	486.7	0.086	0.054
CO2e	117,097	40 CFR 98 Subpart C	0.390	486.7	45,678	28,494
Lead	5.00E-04	AP-42 Tables 1.4-4.	0.390	486.7	1.95E-04	1.22E-04
Total HAPs	1.89	AP-42 Tables 1.4-3 & 1.4-4.	0.390	486.7	0.74	0.46

31. Hot Baghouses Lime Silos and Cold Baghouse Dry Sorbent Silos

> The hot baghouses will use ~~six (6)~~ **five(5)** free standing lime silos complete with level sensors including a high level sensor to avoid overfilling. Silo venting will be accomplished by a bin vent, so no additional pressure relief device will be used. A fill line from the truck unload station to the silo will be equipped with a pneumatic knife gate with operator. The materials will remain free flowing due to the live bin bottom.

> **The cold baghouses will use two (2) free standing dry sorbent silos complete with level sensors including a high level sensor to avoid overfilling. Silo venting will be accomplished by a bin vent, so no additional pressure relief device will be used. A fill line from the truck unload station to the silo will be equipped with a pneumatic knife gate with operator. The materials will remain free flowing due to the live bin bottom.**

Emission Unit IDs:	**AS-20-1**
Emission Unit Descriptions:	**Hot Baghouses Lime Silos (5)**
Emission Unit IDs:	**AS-33-1**
Emission Unit Descriptions:	**Cold Baghouse Dry Sorbent Silos (2)**

31.1 Documentation of Emission Factors Used for the Lime Silos

31.1.1 PM Emission Factors Tied to Lime Processing

> Particulate emissions at the outlet of the proposed lime silos are estimated using an assumed emissions performance. To determine the annual emissions, the maximum annual lime throughput and assumed truck lime weight are used to determine the number of annual truck deliveries. Estimating the truck loading time then provides the annual truck loading time when emissions are routed to the bin vent for exhaust to the atmosphere.

> Assumes PM = PM10 = PM2.5. There are no condensable PM emissions associated with this process.

Parameter	Value		Basis
Stack Emissions			
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.010	gr/dscf	Exit grain loading design basis for bin vent filter
Bin Vent Flow Capacity	1,035	dscfm	Equivalent to 1,000 acfm at stack exit temperature of 50 deg. F and minimal stack gas moisture content
Filt. PM Hourly Emission Rate	0.089	lb/hr	0.010 gr filt. PM/dscf x 1,035 dscf/min x 60 min/hr x 1 lb / 7,000 gr = 0.089 lb PM/hr
Alk. Reagent Density	40.0	lb/cf	
Max. Hourly Alk. Reagent Process Rate for Hot Baghouses Lime Silos (5)	**1,800**	lb/hr	Nominal capacity
Max. Annual Alk. Reagent Process Rate for Hot Baghouses Lime Silos (5)	**7,884**	tpy	1,800 lb/hr x 8,760 hr/yr / 2,000 lb/ton = 7,884.0 tpy
Assumed Alk. Reagent Weight in Delivery Trucks	25.0	ton/truck	
Max. Annual Truck Deliveries for Hot Baghouses Lime Silos (5)	**315.0**	truck/yr	7,884 tpy / 25 ton/truck = 315.0 truck/yr
Max. Annual Truck Loading Time for Hot Baghouses Lime Silos (5)	**315.0**	hr/yr	Assumed worst-case truck loading event duration is 1 hours
Filt. PM Annual Emission Rate for Hot Baghouses Lime Silos (5)	**27.95**	lb/yr	0.089 lb/hr x 315.00 hr/yr = 27.95 lb/yr
Filt. PM Annual Emission Rate for Hot Baghouses Lime Silos (5)	**1.40E-02**	tpy	27.95 lb/yr / 2,000 lb/ton = 1.40E-02 tpy
Filt. PM Annual Emission Rate (production basis) for Hot Baghouses Lime Silos (5)	**3.55E-03**	lb/ton	27.95 lb/yr / 7,884 tpy = 3.55E-03 lb/ton

31.1.2 PM Emission Factors Tied to Dry Sorbent Processing

> **Particulate emissions at the outlet of the proposed dry sorbent silos are estimated using an assumed emissions performance. To determine the annual emissions, the maximum annual sorbent throughput and sorbent capacity are used to determine the number of annual truck deliveries. Estimating the truck loading time then provides the annual truck loading time when emissions are routed to the bin vent for exhaust to the atmosphere.**

> **Assumes PM = PM10 = PM2.5. There are no condensable PM emissions associated with this process.**

Parameter	Value		Basis
Stack Emissions			
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.010	gr/dscf	Exit grain loading design basis for bin vent filter
Bin Vent Flow Capacity	1,035	dscfm	Equivalent to 1,000 acfm at stack exit temperature of 50 deg. F and minimal stack gas moisture content
Filt. PM Hourly Emission Rate	0.089	lb/hr	0.010 gr filt. PM/dscf x 1,035 dscf/min x 60 min/hr x 1 lb / 7,000 gr = 0.089 lb PM/hr
Dry Sorbent Density	16.0	lb/cf	
Max. Hourly Process Rate for Cold Baghouse Dry Sorbent Silos (2)	**3.3**	lb/hr	Nominal design
Max. Annual Process Rate for Cold Baghouse Dry Sorbent Silos (2)	**14.6**	tpy	3.33 lb/hr x 8,760 hr/yr / 2,000 lb/ton = 14.6 tpy
Max. Storage Volume for Cold Baghouse Dry Sorbent Silos (2)	**2,106**	cf	Nominal capacity
Max. Storage Capacity for Cold Baghouse Dry Sorbent Silos (2)	**16.8**	ton	2,106 cubic foot x 16.0lb/cubic foot / 2,000 lb/ton = 16.8 ton
Max. Annual Truck Deliveries for Cold Baghouse Dry Sorbent Silos (2)	**0.87**	truck/yr	14.6 tpy / 17 ton = 0.87 truck/yr
Max. Annual Truck Loading Time for Cold Baghouse Dry Sorbent Silos (2)	**0.87**	hr/yr	Assumed worst-case truck loading event duration is 1 hours
Filt. PM Annual Emission Rate for Cold Baghouse Dry Sorbent Silos (2)	**0.077**	lb/yr	0.089 lb/hr x 0.87 hr/yr = 0.077 lb/yr
Filt. PM Annual Emission Rate for Cold Baghouse Dry Sorbent Silos (2)	**3.85E-05**	tpy	0.077 lb/yr / 2,000 lb/ton = 3.85E-05 tpy
Filt. PM Annual Emission Rate (production basis) for Cold Baghouse Dry Sorbent Silos (2)	**5.27E-03**	lb/ton	0.077 lb/yr / 14.60 tpy = 5.27E-03 lb/ton

31.2 Potential Emission Calculations for the Lime Silos

31.2.1 Potential Emissions Tied to Lime Processing (Stack) for Hot Baghouses Lime Silos (5)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Total Potential Emission Rate for Lime Silos (lb/hr)	(tpy)
PM	3.55E-03	lb/ton	Grain Loading Design Basis	0.90	7,884.0	3.19E-03	1.40E-02
PM10	3.55E-03	lb/ton	Grain Loading Design Basis	0.90	7,884.0	3.19E-03	1.40E-02
PM2.5	3.55E-03	lb/ton	Grain Loading Design Basis	0.90	7,884.0	3.19E-03	1.40E-02

31.2.2 Potential Emissions Tied to Lime Processing (Stack) for Cold Baghouse Dry Sorbent Silos (2)

> Emission factors shown below are the stack emission factors.

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis		Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Total Potential Emission Rate for Dry Sorbent Silos (lb/hr)	(tpy)
PM	5.27E-03	lb/ton	Grain Loading Design Basis	1.67E-03	14.6	8.78E-06	3.85E-05
PM10	5.27E-03	lb/ton	Grain Loading Design Basis	1.67E-03	14.6	8.78E-06	3.85E-05
PM2.5	5.27E-03	lb/ton	Grain Loading Design Basis	1.67E-03	14.6	8.78E-06	3.85E-05

32. Diesel Fuel Storage and Refueling Station

> **One main/primary 15,000** gallon capacity diesel fuel storage tank will be installed as part of the proposed project. The **main/primary diesel storage tank** stores diesel as a fuel for various mobile equipment and maintenance operations associated with the process area. **Three additional 572 gallon capacity diesel fuel storage tanks will be installed to support the three fire pump engines (one tank in the North Pump House and two tanks in the West Pump House).**

Emission Unit IDs: **AS-21-1 through AS-21-3**

Emission Unit Descriptions: **Diesel Fuel Storage and Refueling Stations (4)**

32.1 Diesel Storage Tank Design Details

Diesel Fuel Storage and Refueling Station

Parameter	Value		Basis
Storage Capacity per Tank	**15,000**	gal	Tank design
Max. Hourly Throughput per Tank	1.20E-02	Mgal/hr	105.5 Mgal/yr / 8,760 hr/yr = 1.20E-02 Mgal/hr
Max. Annual Throughput per Tank	**105.5**	Mgal/yr	Maximum annual fuel usage estimate for vehicle refueling/maintenance uses
Tank Diameter	**10.8**	feet	Tank design
Tank Length	**24.00**	feet	Nominal capacity
Tank Color	**Gray**	--	Tank design

Fire Pump Engine North Pump House Diesel Tank

Parameter	Value		Basis
Storage Capacity per Tank	572	gal	Tank design
Max. Hourly Throughput per Tank	2.17E-03	Mgal/hr	19.0 Mgal/yr / 8,760 hr/yr = 2.17E-03 Mgal/hr
Max. Annual Throughput per Tank	19.0	Mgal/yr	Maximum annual fuel usage estimate for fire pump engine refueling
Tank Diameter	4.08	feet	Tank design
Tank Length	5.98	feet	Nominal capacity
Tank Color	Gray	--	Tank design

Fire Pump Engine West Pump House Diesel Tanks (2)

Parameter	Value		Basis
Storage Capacity per Tank	572	gal	Tank design
Max. Hourly Throughput per Tank	1.88E-03	Mgal/hr	16.5 Mgal/yr / 8,760 hr/yr = 1.88E-03 Mgal/hr
Max. Annual Throughput per Tank	16.5	Mgal/yr	Maximum annual fuel usage estimate for fire pump engine refueling
Tank Diameter	4.08	feet	Tank design
Tank Length	5.98	feet	Nominal capacity
Tank Color	Gray	--	Tank design

32.2 Diesel Fuel Properties

Parameter	Value		Basis
Diesel Fuel Density	7.10	lb/gal	TankESP speciation profile for Diesel
Molecular Weight - Liquid	188.0	lb/lbmol	TankESP speciation profile for Diesel
Molecular Weight - Vapor	130.0	lb/lbmol	TankESP speciation profile for Diesel

32.3 Diesel Fuel Loading Loss

Parameter	Value		Basis
Constant	12.46	--	From AP-42 Section 5.2 Equation (1)
Saturation Factor (S)	1.45	--	Splash loading: dedicated normal service from AP-42 Table 5.2-1
True Vapor Pressure (P)	1.02E-02	psia	From TankESP
Temperature of Liquid Loaded	530.3	deg. R	From TankESP

32.4 Potential Emission Calculations for the Diesel Tank

32.4.1 Potential Emissions Tied to Diesel Storage and Refueling Station

> Emission factors shown below represent evaporative loss VOC emissions from the tanks and refueling process.

Pollutant	Evap. Loss Type	Emission Factor (lb/Mgal)	Emission Factor Basis		Maximum Hourly Process Rate Value	Maximum Hourly Process Rate Units	Maximum Annual Process Rate Value	Maximum Annual Process Rate Units	Potential Emission Rate Per Tank & Refueling Station (lb/hr)	Potential Emission Rate Per Tank & Refueling Station (tpy)
VOC	Standing	0.37	lb/Mgal-cap	TankESP	1.71E-03	Mgal-cap/hr	15.0	Mgal-cap/yr	6.41E-04	2.81E-03
	Working	0.031	lb/Mgal	TankESP	1.20E-02	Mgal/hr	105.5	Mgal/yr	3.68E-04	1.61E-03
	Loading	0.045	lb/Mgal	AP-42 Section 5.2 Eq (1)	1.20E-02	Mgal/hr	105.5	Mgal/yr	5.42E-04	2.37E-03
	Total								1.55E-03	6.79E-03

32.4.2 Potential Emissions Tied to Fire Pump Engine North Pump House Diesel Tank

> Emission factors shown below represent evaporative loss VOC emissions from the tanks and refueling process.

Pollutant	Evap. Loss Type	Emission Factor (lb/Mgal)	Emission Factor Basis		Maximum Hourly Process Rate Value	Maximum Hourly Process Rate Units	Maximum Annual Process Rate Value	Maximum Annual Process Rate Units	Potential Emission Rate Per Tank & Refueling Process (lb/hr)	Potential Emission Rate Per Tank & Refueling Process (tpy)
VOC	Standing	0.33	lb/Mgal-cap	TankESP	6.53E-05	Mgal-cap/hr	0.57	Mgal-cap/yr	2.16E-05	9.47E-05
	Working	0.024	lb/Mgal	TankESP	2.17E-03	Mgal/hr	19.0	Mgal/yr	5.25E-05	2.30E-04
	Loading	0.045	lb/Mgal	AP-42 Section 5.2 Eq (1)	2.17E-03	Mgal/hr	19.0	Mgal/yr	9.76E-05	4.27E-04
	Total								1.72E-04	7.52E-04

32.4.3 Potential Emissions Tied to Fire Pump Engine West Pump House Diesel Tank

> Emission factors shown below represent evaporative loss VOC emissions from the tanks and refueling process.

Pollutant	Evap. Loss Type	Emission Factor (lb/Mgal)	Emission Factor Basis		Maximum Hourly Process Rate Value	Maximum Hourly Process Rate Units	Maximum Annual Process Rate Value	Maximum Annual Process Rate Units	Potential Emission Rate Per Tank & Refueling Process (lb/hr)	Potential Emission Rate Per Tank & Refueling Process (tpy)	Total Potential Emission Rate (lb/hr)	Total Potential Emission Rate (tpy)
VOC	Standing	0.33	lb/Mgal-cap	TankESP	6.53E-05	Mgal-cap/hr	0.57	Mgal-cap/yr	2.16E-05	9.47E-05	4.32E-05	1.89E-04
	Working	0.027	lb/Mgal	TankESP	1.88E-03	Mgal/hr	16.5	Mgal/yr	5.10E-05	2.23E-04	1.02E-04	4.47E-04
	Loading	0.045	lb/Mgal	AP-42 Section 5.2 Eq (1)	1.88E-03	Mgal/hr	16.5	Mgal/yr	8.47E-05	3.71E-04	1.69E-04	7.42E-04
	Total								1.57E-04	6.89E-04	3.15E-04	1.38E-03

33. Auxiliary Storage Tanks for Process Operations Emissions Summary

> The Hot Rolling area includes **14** fixed roof or open top storage tanks for storing rolling oil, additives, and water-oil emulsion coolant needed for the Hot Reversing and Hot Finishing Mills.

> The Cold Rolling area includes **13** fixed roof or open top storage tanks for storing rolling oil, additives, and water-oil emulsion coolant needed for the Tandem Cold Mill.

> The Coil Finishing area includes **10 larger primary/bulk storage tanks and 12 smaller support/day storage tanks all with fixed roofs** for containing the alkaline cleaning chemical "bath" associated with the strip cleaning component of the Coating Line and for storing coatings and waste solvent associated with the coating application and equipment cleaning process for the Coating Line.

> The storage tank emission calculations were developed using TankESP®. Potential emission calculations for the storage tanks rely on a set number of parameters for each tank including service type, roof type, tank color, tank dimensions, roof fittings, pressure settings, bulk liquid storage temperature, throughput and more. A complete summary of these parameters for the Hot Rolling, Cold Rolling, and Coil Finishing Area tanks (qualifying as insignificant emission units) can be found in TankESP® reports **on an individual tanks basis as electronic attachment, upon request by ADEM.**

33.1 Hot Rolling Area Storage Tank Design Details

Emission Unit ID	Emission Unit Description	Tank Description	Contents	Orientation	Storage Capacity (gal)	Max. Hourly Throughput (Mgal/hr)	Max. Annual Throughput (Mgal/yr)	Tank Diameter (ft.)	Tank Height/ Length (ft.)
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	RM Emulsion Main Tank- Dirty Chamber	HRM Coolant Surrogate	V	11,091	316	2,766,491	16.4	8.0
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	RM Emulsion Main Tank-Intermediate Chamber	HRM Coolant Surrogate	V	43,750	287	2,515,371	32.8	8.0
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	RM Emulsion Main Tank-Clean Chamber	HRM Coolant Surrogate	V	11,335	316	2,766,491	16.3	8.0
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	RM Emulsion Sump tank	HRM Coolant Surrogate	V	16,275	287	2,515,371	19.8	11.5
~~AS-22-1 & AS-22-2~~	~~Hot Rolling Area Storage Tanks (14)~~	~~RM Emulsion Storage Tank for Cleaning~~	~~HRM Coolant Surrogate~~	~~V~~	~~39,626~~	~~158.52~~	~~1,388,639~~	~~29.0~~	~~8.0~~
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	RM Emulsion Base Oil Tank	HRM Coolant Surrogate	V	13,476	0.79	6,920	15.5	10.5
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	RM Emulsion Premix Tank	HRM Coolant Surrogate	V	9,426	15.87	139,021	15.2	7.2
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	RM Emulsion Additive Tank	HRM Coolant Surrogate	V	529	2.38	20,849	4.0	7.7

Emission Unit ID	Emission Unit Description	Tank Description	Contents	Orientation	Storage Capacity (gal)	Max. Hourly Throughput (Mgal/hr)	Max. Annual Throughput (Mgal/yr)	Tank Diameter (ft.)	Tank Height/ Length (ft.)
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	FM Emulsion Main Tank #1/#2 - Dirty Chamber	HFM Coolant Surrogate	V	35,467	1,111	9,733,324	25.6	11.2
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	FM Emulsion Main Tank #1/#2 - Intermediate Chamber	HFM Coolant Surrogate	V	142,651	1,049	9,191,167	41.8	11.2
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	FM Emulsion Main Tank #1/#2 - Clean Chamber	HFM Coolant Surrogate	V	35,714	1,111	9,733,324	25.6	11.2
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	FM Emulsion Sump Tank (Return Tank)	HFM Coolant Surrogate	V	50,667	1,049	9,191,167	33.5	11.5
~~AS-22-1 & AS-22-2~~	~~Hot Rolling Area Storage Tanks (14)~~	~~FM Emulsion Storage Tank for Cleaning~~	~~HFM Coolant Surrogate~~	~~V~~	~~118,877~~	~~2.31~~	~~20,202~~	~~50.3~~	~~8.0~~
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	FM Emulsion Base Oil Tank	HFM Coolant Surrogate	V	13,476	0.79	6,920	15.5	10.5
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	FM Emulsion Premix Tank	HFM Coolant Surrogate	V	9,426	15.87	139,021	15.2	7.2
AS-22-1 & AS-22-2	Hot Rolling Area Storage Tanks (14)	FM Emulsion Additive Tank	HFM Coolant Surrogate	V	529	2.38	20,849	4.0	7.7

33.2 Cold Rolling Area Storage Tank Design Details

Emission Unit ID	Emission Unit Description	Tank Description	Contents	Orientation	Storage Capacity (gal)	Max. Hourly Throughput (Mgal/hr)	Max. Annual Throughput (Mgal/yr)	Tank Diameter (ft.)	Tank Height/ Length (ft.)
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM Emulsion Main Tank-Dirty Section (T1)	TCM Coolant Surrogate	V	95,389	0	0	15.0	71.8
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM Emulsion Main Tank-Clean Section (T1)	TCM Coolant Surrogate	V	76,454	0	0	15.0	57.5
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM Rolling Oil Separator Tank (T3)	TCM Coolant Surrogate	V	7,418	0	0	9.8	13.1
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM Main Oil Separation Tank (T2)	TCM Coolant Surrogate	V	9,114	0	0	10.1	15.1
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM Rolling Oil System Tank -Clean Section (T4)	TCM Coolant Surrogate	V	23,966	0	0	13.1	23.6
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM Rolling Oil System Tank -Dirty Section (T4)	TCM Coolant Surrogate	V	29,471	0.047	412.15	13.1	29.0
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM Rolling Oil System Tank -Circ Section (T4)	TCM Coolant Surrogate	V	6,477	0	0	13.1	6.4
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM HES System Main Oil Tank (T5)	TCM Coolant Surrogate	V	4,477	0.62	5,400	7.9	12.3
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM Base Rolling Oil Supply Tank (T6)	TCM Coolant Surrogate	V	18,722	0.014	119	11.2	25.6
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM Multi-Plate Filter Mixing Tank 1 (T2.1)	TCM Coolant Surrogate	V	1,235	0.10	868	7.8	3.4
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	TCM Multi-Plate Filter Mixing Tank 2 (T2.2)	TCM Coolant Surrogate	V	1,235	0.10	868	7.8	3.4
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	Rolling Oil Bulk Supply Tank #1 (TK-0001)	TCM Coolant Surrogate	V	20,360	0.047	412	10.1	34.1
AS-23-1 & AS-23-2	Cold Rolling Area Storage Tanks (13)	Rolling Oil Bulk Supply Tank #2 (TK-0002)	TCM Coolant Surrogate	V	20,360	0.047	412	10.1	34.1

33.3 Coil Finishing Area Storage Tank Design Details

Emission Unit ID	Emission Unit Description	Tank Description	Contents (Or Equivalent)	Orientation	Storage Capacity (gal)	Max. Hourly Throughput (Mgal/hr)	Max. Annual Throughput (Mgal/yr)	Tank Diameter (ft.)	Tank Height/ Length (ft.)
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Coating Line Tank A	Gardonclean S 5675 (Gardoclean)	H	6,650	0.014	120	8.5	15.7
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Coating Line Tank B	Valspar EzDEX® RFU Interior (13Q80AG)	V	15,934	0.057	500	12.0	18.8
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Coating Line Tank C	**Valpure™ Waterbased End Coating (V70Q05AC)**	V	15,934	0.074	650	12.0	18.8
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Coating Line Tank D	Valspar EzDEX® Exterior Clear (13Q80CE)	V	15,934	0.034	300	12.0	18.8
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Coating Line Tank E	Sherwin-Williams EzDEX® Exterior Clear (4000R008)	V	10,869	0.023	200	10.0	18.5
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Coating Line Tank F HAP	Waste Solvent_HAP (Waste Solvent A)	V	10,869	0.006	50	10.0	18.5
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Coating Line Tank F VOC	Waste Solvent_VOC (Waste Solvent B)	H	10,869	0.006	50	10.0	18.5

Emission Unit ID	Emission Unit Description	Tank Description	Contents (Or Equivalent)	Orientation	Storage Capacity (gal)	Max. Hourly Throughput (Mgal/hr)	Max. Annual Throughput (Mgal/yr)	Tank Diameter (ft.)	Tank Height/ Length (ft.)
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Stage 1 Alkaline Cleaning	TL Lubricant Surrogate (TLL)	H	5,390	0.360	3,154	6.4	22.7
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Stage 2 Alkaline Cleaning	TL Lubricant Surrogate (TLL)	V	5,390	0.720	6,307	6.4	22.7
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Coating Line Tank G	External End Coating (80X-12759)	V	10,869	0.017	150	10.0	18.5
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Alkaline Cleaning Day Tank	Gardonclean S 5675 (Gardoclean)	V	1,107	0.018	160	4.3	10.4
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Paint Day Tank 1	Valspar EzDEX® RFU Interior (13Q80AG)	V	729	0.034	300	4.0	7.8
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Paint Day Tank 2	Valpure™ Waterbased End Coating (V70Q05AC)	V	729	0.074	650	4.0	7.8
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Paint Day Tank 3	Valspar EzDEX® Exterior Clear (13Q80CE)	V	729	0.034	300	4.0	7.8

Emission Unit ID	Emission Unit Description	Tank Description	Contents (Or Equivalent)	Orientation	Storage Capacity (gal)	Max. Hourly Throughput (Mgal/hr)	Max. Annual Throughput (Mgal/yr)	Tank Diameter (ft.)	Tank Height/ Length (ft.)
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Paint Day Tank 4	Sherwin-Williams EzDEX® Exterior Clear (4000R008)	V	729	0.023	200	4.0	7.8
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Paint Day Tank 5	Valpure™ V7005 Waterbased End Coating (V70Q05BR1)	V	397	0.011	100	3.0	7.5
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Paint Day Tank 6	EzDEX® Modified Exterior (13Q80CA)	V	397	0.002	20	3.0	7.5
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Paint Day Tank 7	Ezdex® Coke Gold Exterior (13Q80MJ)	V	397	0.001	10	3.0	7.5
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Pretreatment Day Tank 1	Permatreat 1700	V	47,003	0.008	73	40.0	5.0
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Pretreatment Day Tank 2	Permatreat 1700	V	47,003	0.008	73	40.0	5.0
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Pretreatment Day Tank 3	Permatreat 1903R	V	47,003	0.008	73	40.0	5.0

Emission Unit ID	Emission Unit Description	Tank Description	Contents (Or Equivalent)	Orientation	Storage Capacity (gal)	Max. Hourly Throughput (Mgal/hr)	Max. Annual Throughput (Mgal/yr)	Tank Diameter (ft.)	Tank Height/ Length (ft.)
AS-24-1 & AS-24-2	Coil Finishing Area Storage Tanks (22)	Pretreatment Day Tank 4	Permatreat 1903R	V	47,003	0.008	73	40.0	5.0

33.4 Stock (Material Stored) Properties

33.4.1 HRM Coolant Surrogate Properties

Physical/Chemical Property	Value		Basis
Density:	7.34	lb/gal	Density of QH EVEROLL™ A 2300 NS1 (or equivalent) base rolling oil for water/oil emulsion coolant supplied to HRM
Molecular Weight - Liquid:	525.0	lb/lbmol	TankESP speciation profile for HRM Coolant Surrogate (hexadecane, C16H34, CAS No. 544-76-3)
Molecular Weight - Vapor:	226.4	lb/lbmol	TankESP speciation profile for HRM Coolant Surrogate

33.4.2 HFM Coolant Surrogate Properties

Physical/Chemical Property	Value		Basis
Density:	7.74	lb/gal	Density of LMC-xx (or equivalent) base rolling oil for water/oil emulsion coolant supplied to HFM
Molecular Weight - Liquid:	376.7	lb/lbmol	TankESP speciation profile for HFM Coolant Surrogate (pentadecane, C15H33, CAS No. 629-62-9)
Molecular Weight - Vapor:	212.4	lb/lbmol	TankESP speciation profile for HFM Coolant Surrogate

33.4.3 TCM Coolant Surrogate Properties

Physical/Chemical Property	Value		Basis
Density:	6.79	lb/gal	Density of Magiesol 47 (or equivalent) base rolling oil for water/oil emulsion coolant supplied to TCM
Molecular Weight - Liquid:	198.4	lb/lbmol	TankESP speciation profile for TCM Coolant Surrogate (tetradecane, C14H30, CAS No. 629-59-4)
Molecular Weight - Vapor:	198.4	lb/lbmol	TankESP speciation profile for TCM Coolant Surrogate

33.4.4 Coil Finishing Area Stock Properties

Coating Line Tank A and Alkaline Cleaning Day Tank- Gardonclean S 5675 (Gardoclean) Stock Properties

> Gardoclean S 5675 (or equivalent) is the alkaline cleaning agent (i.e., detergent like substance) used in an aqueous solution to clean the strip before pre-treatment and roll coating application in the downstream process steps of the Coating Line. This material does not contain any VOC, HAP, or other regulated air pollutants, so **Coating Tank A and Alkaline Cleaning Day Tank are not modeled explicitly in TankESP as they are not considered to be a source of regulated pollutant air emissions.**

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Potassium Hydroxide	1310-58-3	56.11	15.0	wt. %	Section 3. Composition / Information on Ingredients of SDS
Tetrasodium-pyrophosphate	7722-88-5	265.9	3.0	wt. %	Section 3. Composition / Information on Ingredients of SDS
benzyldimethyoctylammonium chloride	959-55-7	185.69	3.0	wt. %	Section 3. Composition / Information on Ingredients of SDS

Pretreatment Day Tank 1 and Pretreatment Day Tank 2- Permatreat 1700 Stock Properties

> Permatreat 1700 (or equivalent) is the chromium-based strip pretreatment chemical used in an aqueous solution to pretreat the strip surface before the roll coating application in the downstream process steps of the Coating Line. This material does not contain any VOC, HAP, or other regulated air pollutants, so **Pretreatment Day Tanks 1 & 2 are not modeled explicitly in TankESP as they are not considered to be a source of regulated pollutant air emissions.**

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Chromium fluoride (CrF3)	7788-97-8	108.99	7.5	wt. %	Section 3. Composition / Information on Ingredients of SDS
Orthophosphoric acid	7664-38-2	97.995	5.0	wt. %	Section 3. Composition / Information on Ingredients of SDS

Pretreatment Day Tank 3 and Pretreatment Day Tank 4- Permatreat 1903R Stock Properties

> Permatreat 1903 (or equivalent) is the chromium-free strip pretreatment chemical used in an aqueous solution to pretreat the strip surface before the roll coating application in the downstream process steps of the Coating Line. This material does not contain any VOC, HAP, or other regulated air pollutants, so **Pretreatment Day Tanks 3 & 4 are not modeled explicitly in TankESP as they are not considered to be a source of regulated pollutant air emissions.**

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Hexafluorozirconic acid	12021-95-3	207.23	3.0	wt. %	Section 3. Composition / Information on Ingredients of SDS

Coating Line Tank B and Paint Day Tank 1 - Valspar EzDEX® RFU Interior (13Q80AG) Stock Properties

> Valspar EzDEX® RFU Interior (13Q80AG) (or equivalent) is a colorless, water-based coating used to coat one side of the aluminum strip to be used for the interior of beverage can ends. The water fraction is obtained from the technical data sheet (TDS)/environmental data sheet (EDS) and the VOC/HAP composition is obtained from the SDS. The non-water fraction of the coating is conservatively assumed to contain the hazardous ingredients from the SDS (e.g., excluding solids) and this non-water fraction is speciated into individual HAP and VOC compounds using SDS hazardous ingredient composition profile. This coating material composition characterization approach allows for the full speciation option for defining the stock in TankESP to be implemented by entering the 100% composition profile for the liquid phase.

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Diethylene glycol monoethyl ether	111-90-0	134.17	19.4	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP as glycol ether
Ethylene glycol	107-21-1	62.07	8.3	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP
Isopropyl alcohol	67-63-0	60.1	4.4	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
1-Butanol	71-36-3	74.12	4.4	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
Formaldehyde	50-00-0	30.03	0.2	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP
Water	7732-18-5	18.016	63.2	wt. %	Coating Supplier EDS
Total Composition for Full Speciation			100.0		

Coating Line Tank C and Paint Day Tank 2 - Valpure™ Waterbased End Coating (V70Q05AC) Stock Properties

> Valpure™ Waterbased End Coating (V70Q05AC) (or equivalent) is an additional colorless, water-based coating used for can end/tab stock. The same material composition characterization approach used for 13Q80AG is applied to this coating.

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Ethylene glycol	107-21-1	62.07	22.6	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP as ethylene glycol
Propylene glycol monomethyl ether	107-98-2	90.12	22.6	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
1-Butanol	71-36-3	74.12	11.3	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
Methyl Isobutyl Ketone (2-pentanone, 4-methyl-)	108-10-1	100.16	6.8	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP as methyl isobutyl ketone (Hexone)
Isobutyl alcohol	78-83-1	74.12	6.8	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
Formaldehyde	50-00-0	30.03	0.7	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP as formaldehyde
Phenol	108-95-2	94.11	0.7	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP as phenol
Water	7732-18-5	18.016	28.5	wt. %	Volatile Composition Report
Total Composition for Full Speciation			100.0		

Coating Line Tank D and Paint Day Tank 3 - Valspar EzDEX® Exterior Clear (13Q80CE) Stock Properties

> Valspar EzDEX® Exterior Clear (13Q80CE) (or equivalent) is an additional colorless, water-based coating used for can end/tab stock. The same material composition characterization approach used for 13Q80AG is applied to this coating.

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
2-Butoxyethanol	111-76-2	118.17	12.5	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
1-Butanol	71-36-3	74.12	6.3	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
Isopropyl alcohol	67-63-0	60.1	3.8	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
2-(Dimethylamino)ethanol	108-01-0	89.14	3.8	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
Formaldehyde	50-00-0	30.03	0.1	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP
Water	7732-18-5	18.016	73.6	wt. %	Assume equivalent to 13Q80CA since products have same density
Total Composition for Full Speciation			100.0		

Coating Line Tank E and Paint Day Tank 4 - Sherwin-Williams EzDEX® Exterior Clear (4000R008) Stock Properties

> Sherwin-Williams EzDEX® Exterior Clear (4000R008) (or equivalent) is an additional colorless, water-based coating used for can end/tab stock. The same material composition characterization approach used for 13Q80AG is applied to this coating.

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Diethylene glycol monoethyl ether	111-90-0	134.17	16.0	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP as glycol ether
2-Butoxyethanol	111-76-2	118.17	6.9	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
1-Butanol	71-36-3	74.12	3.7	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
Formaldehyde	50-00-0	30.03	0.1	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP
Water	7732-18-5	18.016	73.4	wt. %	Coating Supplier EDS
Total Composition for Full Speciation			100.0		

Coating Line Tank F HAP and VOC - Waste Solvent HAP (Waste Solvent A) and VOC (Waste Solvent B) Stock Properties

> Coating Tank F stores waste solvents/coatings as a small fraction (<10%) of a predominantly water-containing (>90%) waste stream from the coating application processes in the Coating Line. With a variable organic compound composition profile, Novelis has conservatively chosen to model the non-water fraction of the Coating Tank F contents under two scenarios: 1) highest vapor pressure VOC compound (isopropyl alcohol) comprising the 10% non-water fraction, and 2) highest vapor pressure HAP (MIBK) comprising the 10% non-water fraction. The MIBK is contained in a coating that is not stored in a bulk tank, but is supplied to the Coating Line via totes (where totes are sealed and do not have positive displacement for working losses). This conservative Coating Tank F emission calculation approach creates an annual potential emissions profile for VOC and HAP that cannot be exceeded regardless of how the tank contents vary throughput the coating application process for the various products manufactured and coating types used in the Coating Line.

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Worst-Case VOC Emissions Operating Scenario					
Isopropyl Alcohol	67-63-0	60.1	10.0	wt. %	Highest vapor pressure VOC at maximum non-water fraction of tank contents
Water	7732-18-5	18.016	90.0	wt. %	Minimum water fraction of tank contents
Total Composition for Full Speciation			100.0		

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Worst-Case HAP Emissions Operating Scenario					
Methyl isobutyl ketone (hexone)	108-10-1	100.16	10.0	wt. %	Highest vapor pressure VOC at maximum non-water fraction of tank contents
Water	7732-18-5	18.016	90.0	wt. %	Minimum water fraction of tank contents
Total Composition for Full Speciation			100.0		

Stage 1 and Stage 2 Alkaline Cleaning - TL Lubricant Surrogate Stock Properties

> The Stage 1 and 2 alkaline cleaning chemical recirculation tanks are conservatively modeled as containing a continuous oil layer at the surface of the aqueous chemical bath comprised of the lubricant used in the tension leveler (TL) (Magiesol 52 with tetradecane used a chemical surrogate similar to the TCM coolant surrogate). The stock properties entered represent the pure chemical properties of tetradecane.

Physical/Chemical Property	Value		Basis
Density:	6.87	lb/gal	Density of Magiesol 52 (or equivalent) tension leveler lubricant
Molecular Weight - Liquid:	198.4	lb/lbmol	TankESP speciation profile for TL Lubricant Surrogate (tetradecane, C14H30, CAS No. 629-59-4)
Molecular Weight - Vapor:	198.4	lb/lbmol	TankESP speciation profile for TL Lubricant Surrogate

Coating Line Tank G - External End Coating (80X-12759) Stock Properties

> External End Coating (80X-12759) (or equivalent) is an additional colorless, water-based coating used for can end/tab stock. The SDS indicates a composition consisting 10-25% epoxy acrylated resin, which is excluded from these conservative calculations. The organic volatile fraction and VOC/HAP composition is obtained from the Composition of Organic Volatiles sheet. The coating is conservatively assumed to only be composed of the organic volatile fraction and this volatile fraction is speciated into individual HAP and VOC compounds using SDS hazardous ingredient composition profile. This coating material composition characterization approach allows for the full speciation option for defining the stock in TankESP to be implemented by entering the 100% composition profile for the liquid phase.

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Epoxy acrylated resin			~~25.0~~	wt. %	Section 3. Composition / Information on Ingredients of SDS; excluded from tank emissions
Ethylene Glycol Monobutyl Ether (2-Butoxyethanol)	111-76-2	118.17	83.4	wt. %	Composition of Organic Volatiles sheet; VOC only
2-(Dimethylamino)ethanol	108-01-0	89.14	13.5	wt. %	Composition of Organic Volatiles sheet; VOC only
1-Butanol	71-36-3	74.12	2.8	wt. %	Composition of Organic Volatiles sheet; VOC only
Ethylene glycol	107-21-1	62.07	0.3	wt. %	Composition of Organic Volatiles sheet; VOC and HAP as ethylene glycol
Formaldehyde	50-00-0	30.03	0.1	wt. %	Composition of Organic Volatiles sheet; VOC and HAP as formaldehyde
Total Composition for Full Speciation			100.0		

Paint Day Tank 5 - Valpure™ V7005 Waterbased End Coating (V70Q05BR1) Stock Properties

> Valpure™ V7005 Waterbased End Coating (V70Q05BR1) (or equivalent) is an additional colorless, water-based coating used for can end/tab stock. The same material composition characterization approach used for 13Q80AG is applied to this coating.

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Diethylene glycol monoethyl ether	111-90-0	134.17	21.5	wt. %	Volatile Composition Report; VOC and HAP as glycol ether
Ethylene Glycol Monobutyl Ether (2-Butoxyethanol)	111-76-2	118.17	15.7	wt. %	Volatile Composition Report; VOC
1-Butanol	71-36-3	74.12	8.7	wt. %	Volatile Composition Report; VOC
Methyl Isobutyl Ketone (2-pentanone, 4	108-10-1	100.16	1.7	wt. %	Volatile Composition Report; VOC and HAP as methyl isobutyl ketone (Hexone)
2-(Dimethylamino)ethanol	108-01-0	89.14	1.4	wt. %	Volatile Composition Report; VOC
Methyl Ethyl Ketone	78-93-3	72.11	0.6	wt. %	Volatile Composition Report; VOC
Water	7732-18-5	18.016	50.4	wt. %	Volatile Composition Report
Total Composition for Full Speciation			100.0		

Paint Day Tank 6 - EzDEX® Modified Exterior (13Q80CA) Stock Properties

> EzDEX® Modified Exterior (13Q80CA) (or equivalent) is a colorless, water-based coating used to coat one side of the aluminum strip to be used for the exterior of beverage can end. The same material composition characterization approach used for 13Q80AG is applied to this coating.

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Diethylene glycol monoethyl ether	111-90-0	134.17	9.9	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP as glycol ether
2-Butoxyethanol	111-76-2	118.17	6.6	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
1-Butanol	71-36-3	74.12	3.3	wt. %	Section 3. Composition / Information on Ingredients of SDS;VOC only
Isopropyl alcohol	67-63-0	60.1	3.3	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
2-(Dimethylamino)ethanol	108-01-0	89.14	3.3	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC only
Formaldehyde	50-00-0	30.03	0.1	wt. %	Section 3. Composition / Information on Ingredients of SDS; VOC and HAP as formaldehyde
Water	7732-18-5	18.016	73.6	wt. %	Coating Supplier EDS
Total Composition for Full Speciation			100.0		

Paint Day Tank 7 - Ezdex® Coke Gold Exterior (13Q80MJ) Stock Properties

> Ezdex® Coke Gold Exterior (13Q80MJ) (or equivalent) is a gold, water-based coating used for can exterior body stock. The same material composition characterization approach used for 13Q80AG is applied to this coating.

Chemical Name	CAS No.	Molecular Weight of Chemical (lb/lbmol)	Liquid Phase Composition (wt. %)		Basis
Ethylene Glycol Monobutyl Ether (2-Butoxyethanol)	111-76-2	118.17	31.3	wt. %	Volatile Composition Report; VOC
Diethylene Glycol Monoethyl Ether	111-90-0	134.17	14.0	wt. %	Volatile Composition Report; VOC
1-Butanol	71-36-3	100.16	6.3	wt. %	Volatile Composition Report; VOC
2-(Dimethylamino)ethanol	108-01-0	89.14	0.8	wt. %	Volatile Composition Report; VOC and HAP as methyl isobutyl ketone (Hexone)
Solvant Orange 11	71839-88-8	-	-	wt. %	Volatile Composition Report; excluded from tank emissions
Solvent Orange 99	85203-44-7	-	-	wt. %	Volatile Composition Report; excluded from tank emissions
Formaldehyde	50-00-0	30.03	0.1	wt. %	Volatile Composition Report; VOC and HAP as formaldehyde
Water	7732-18-5	18.016	47.5	wt. %	Volatile Composition Report
Total Composition for Full Speciation			100.0		

33.5 Storage Tank Emissions Summary (TankESP Output)

33.5.1 Hot Rolling Area Storage Tanks (14) Potential Emissions

Storage Tank	Pollutant	Evap. Loss Type	Emission Factor Value	Emission Factor Units	Hourly Process Rate Value	Hourly Process Rate Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
RM Emulsion Main Tank- Dirty Chamber	VOC	Breathing	3.53E-03	lb/Mgal-cap	1.27E-03	Mgal-cap/hr	4.47E-06	1.96E-05
		Working	8.62E-05	lb/Mgal	315.81	Mgal/hr	0.027	0.119
		Total					0.027	0.119
RM Emulsion Main Tank- Intermediate Chamber	VOC	Breathing	3.78E-03	lb/Mgal-cap	4.99E-03	Mgal-cap/hr	1.89E-05	8.27E-05
		Working	9.34E-05	lb/Mgal	287.14	Mgal/hr	0.027	0.117
		Total					0.027	0.118
RM Emulsion Main Tank-Clean Chamber	VOC	Breathing	3.31E-03	lb/Mgal-cap	1.29E-03	Mgal-cap/hr	4.28E-06	1.88E-05
		Working	8.62E-05	lb/Mgal	315.81	Mgal/hr	0.027	0.119
		Total					0.027	0.119
RM Emulsion Sump tank	VOC	Breathing	6.49E-03	lb/Mgal-cap	1.86E-03	Mgal-cap/hr	1.21E-05	5.28E-05
		Working	8.43E-05	lb/Mgal	287.14	Mgal/hr	0.024	0.106
		Total					0.024	0.106
~~RM Emulsion Storage Tank for~~	~~VOC~~	~~Breathing~~	~~--~~	~~lb/Mgal-cap~~	~~--~~	~~Mgal-cap/hr~~	~~--~~	~~--~~
		~~Working~~	~~--~~	~~lb/Mgal~~	~~--~~	~~Mgal/hr~~	~~--~~	~~--~~
		~~Total~~					~~--~~	~~--~~
RM Emulsion Base Oil Tank	VOC	Breathing	3.32E-03	lb/Mgal-cap	1.54E-03	Mgal-cap/hr	5.11E-06	2.24E-05
		Working	1.08E-04	lb/Mgal	0.79	Mgal/hr	8.56E-05	3.75E-04
		Total					9.07E-05	3.97E-04
RM Emulsion Premix Tank	VOC	Breathing	2.90E-03	lb/Mgal-cap	1.08E-03	Mgal-cap/hr	3.12E-06	1.36E-05
		Working	8.74E-05	lb/Mgal	15.87	Mgal/hr	0.001	0.006
		Total					0.001	0.006
RM Emulsion Additive Tank	VOC	Breathing	4.37E-03	lb/Mgal-cap	6.04E-05	Mgal-cap/hr	2.64E-07	1.16E-06
		Working	7.20E-05	lb/Mgal	2.38	Mgal/hr	1.71E-04	7.50E-04
		Total					1.72E-04	7.51E-04
FM Emulsion Main Tank #1/#2 - Dirty Chamber	VOC	Breathing	8.96E-03	lb/Mgal-cap	4.05E-03	Mgal-cap/hr	3.63E-05	1.59E-04
		Working	1.89E-04	lb/Mgal	1,111.11	Mgal/hr	0.210	0.920
		Total					0.210	0.921
FM Emulsion Main Tank #1/#2 - Intermediate Chamber	VOC	Breathing	5.11E-03	lb/Mgal-cap	1.63E-02	Mgal-cap/hr	8.32E-05	3.64E-04
		Working	2.00E-04	lb/Mgal	1,049.22	Mgal/hr	0.210	0.918
		Total					0.210	0.918

Storage Tank	Pollutant	Evap. Loss Type	Emission Factor Value	Emission Factor Units	Hourly Process Rate Value	Hourly Process Rate Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
FM Emulsion Main Tank #1/#2 - Clean Chamber	VOC	Breathing	8.86E-03	lb/Mgal-cap	4.08E-03	Mgal-cap/hr	3.61E-05	1.58E-04
		Working	1.89E-04	lb/Mgal	1,111.11	Mgal/hr	0.210	0.920
		Total					0.210	0.921
FM Emulsion Sump Tank (Return Tank)	VOC	Breathing	1.28E-02	lb/Mgal-cap	5.78E-03	Mgal-cap/hr	7.40E-05	3.24E-04
		Working	1.94E-04	lb/Mgal	1,049.22	Mgal/hr	0.204	0.894
		Total					0.204	0.894
~~FM Emulsion Storage Tank for~~	~~VOC~~	~~Breathing~~	~~--~~	~~lb/Mgal-cap~~	~~--~~	~~Mgal-cap/hr~~	~~--~~	~~--~~
		~~Working~~	~~--~~	~~lb/Mgal~~	~~--~~	~~Mgal/hr~~	~~--~~	~~--~~
		~~Total~~					~~--~~	~~--~~
FM Emulsion Base Oil Tank	VOC	Breathing	7.21E-03	lb/Mgal-cap	1.54E-03	Mgal-cap/hr	1.11E-05	4.86E-05
		Working	2.35E-04	lb/Mgal	0.79	Mgal/hr	1.86E-04	8.13E-04
		Total					1.97E-04	8.62E-04
FM Emulsion Premix Tank	VOC	Breathing	6.27E-03	lb/Mgal-cap	1.08E-03	Mgal-cap/hr	6.74E-06	2.95E-05
		Working	1.89E-04	lb/Mgal	15.87	Mgal/hr	0.003	0.013
		Total					0.003	0.013
FM Emulsion Additive Tank	VOC	Breathing	9.54E-03	lb/Mgal-cap	6.04E-05	Mgal-cap/hr	5.76E-07	2.52E-06
		Working	1.57E-04	lb/Mgal	2.38	Mgal/hr	3.74E-04	1.64E-03
		Total					3.74E-04	1.64E-03
Hot Rolling Area Storage Tanks (14) Total	VOC	Breathing					2.96E-04	1.30E-03
		Working					0.94	4.14
		Total					0.94	4.14

> Based on the low potential emission rate, as shown above, the 14 storage tanks in the Hot Rolling area can be classified as a group of insignificant activities. As such, they are not included on ADEM Form 108 for Loading and Storage of Organic Compounds. Instead, they are only listed in Section 12 of the ADEM 103 Form for Facility Identification addressing insignificant activities.

33.5.2 Cold Rolling Area Storage Tanks (13) Potential Emissions

Storage Tank	Pollutant	Evap. Loss Type	Emission Factor		Hourly Process Rate		Potential Emission Rate	
			Value	Units	Value	Units	(lb/hr)	(tpy)
TCM Emulsion Main Tank- Dirty Section (T1)	VOC	Breathing	3.33E-02	lb/Mgal-cap	1.09E-02	Mgal-cap/hr	3.62E-04	1.59E-03
		Working	-	lb/Mgal	-	Mgal/hr	-	-
		Total					3.62E-04	1.59E-03
TCM Emulsion Main Tank- Clean Section (T1)	VOC	Breathing	3.33E-02	lb/Mgal-cap	8.73E-03	Mgal-cap/hr	2.91E-04	1.27E-03
		Working	-	lb/Mgal	-	Mgal/hr	-	-
		Total					2.91E-04	1.27E-03
TCM Rolling Oil Separator Tank (T3)	VOC	Breathing	3.27E-02	lb/Mgal-cap	8.47E-04	Mgal-cap/hr	2.76E-05	1.21E-04
		Working	-	lb/Mgal	-	Mgal/hr	-	-
		Total					2.76E-05	1.21E-04
TCM Main Oil Separation Tank (T2)	VOC	Breathing	3.28E-02	lb/Mgal-cap	1.04E-03	Mgal-cap/hr	3.42E-05	1.50E-04
		Working	-	lb/Mgal	-	Mgal/hr	-	-
		Total					3.42E-05	1.50E-04
TCM Rolling Oil System Tank -Clean Section (T4)	VOC	Breathing	3.31E-02	lb/Mgal-cap	2.74E-03	Mgal-cap/hr	9.06E-05	3.97E-04
		Working	-	lb/Mgal	-	Mgal/hr	-	-
		Total					9.06E-05	3.97E-04
TCM Rolling Oil System Tank -Dirty Section (T4)	VOC	Breathing	3.32E-02	lb/Mgal-cap	3.36E-03	Mgal-cap/hr	1.12E-04	4.89E-04
		Working	7.36E-04	lb/Mgal	0.05	Mgal/hr	3.46E-05	1.52E-04
		Total					1.46E-04	6.41E-04
TCM Rolling Oil System Tank -Circ Section (T4)	VOC	Breathing	2.82E-02	lb/Mgal-cap	7.39E-04	Mgal-cap/hr	2.08E-05	9.12E-05
		Working	-	lb/Mgal	-	Mgal/hr	-	-
		Total					2.08E-05	9.12E-05
TCM HES System Main Oil Tank (T5)	VOC	Breathing	3.06E-02	lb/Mgal-cap	5.11E-04	Mgal-cap/hr	1.57E-05	6.86E-05
		Working	4.75E-04	lb/Mgal	0.62	Mgal/hr	2.93E-04	1.28E-03
		Total					3.08E-04	1.35E-03
TCM Base Rolling Oil Supply Tank (T6)	VOC	Breathing	2.89E-02	lb/Mgal-cap	2.14E-03	Mgal-cap/hr	6.17E-05	2.70E-04
		Working	2.68E-03	lb/Mgal	0.01	Mgal/hr	3.64E-05	1.59E-04
		Total					9.80E-05	4.29E-04
TCM Multi-Plate Filter Mixing Tank 1 (T2.1)	VOC	Breathing	2.17E-02	lb/Mgal-cap	1.41E-04	Mgal-cap/hr	3.06E-06	1.34E-05
		Working	5.82E-04	lb/Mgal	0.10	Mgal/hr	5.76E-05	2.52E-04
		Total					6.07E-05	2.66E-04
TCM Multi-Plate Filter Mixing Tank 2 (T2.2)	VOC	Breathing	2.17E-02	lb/Mgal-cap	1.41E-04	Mgal-cap/hr	3.06E-06	1.34E-05
		Working	5.82E-04	lb/Mgal	0.10	Mgal/hr	5.76E-05	2.52E-04
		Total					6.07E-05	2.66E-04

Storage Tank	Pollutant	Evap. Loss Type	Emission Factor Value	Emission Factor Units	Hourly Process Rate Value	Hourly Process Rate Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Rolling Oil Bulk Supply Tank #1 (TK-0001)	VOC	Breathing	3.25E-02	lb/Mgal-cap	2.32E-03	Mgal-cap/hr	7.56E-05	3.31E-04
		Working	6.59E-04	lb/Mgal	0.05	Mgal/hr	3.10E-05	1.36E-04
		Total					1.07E-04	4.67E-04
Rolling Oil Bulk Supply Tank #2 (TK-0002)	VOC	Breathing	3.25E-02	lb/Mgal-cap	2.32E-03	Mgal-cap/hr	7.56E-05	3.31E-04
		Working	6.59E-04	lb/Mgal	0.05	Mgal/hr	3.10E-05	1.36E-04
		Total					1.07E-04	4.67E-04

Storage Tank	Pollutant	Evap. Loss Type	Value	Units	Value	Units	(lb/hr)	(tpy)
Cold Rolling Area Storage Tanks (13) Total	VOC	Breathing					1.17E-03	5.14E-03
		Working					5.41E-04	2.37E-03
		Total					1.71E-03	7.51E-03

> Based on the low potential emission rate, as shown above, the 13 storage tanks in the Cold Rolling area can be classified as a group of insignificant activities. As such, they are not included on ADEM Form 108 for Loading and Storage of Organic Compounds. Instead, they are only listed in Section 12 of the ADEM 103 Form for Facility Identification addressing insignificant activities.

33.5.3 Coil Finishing Area Storage Tanks (22) Potential Emissions

Storage Tank	Pollutant	Evap. Loss Type	Emission Factor Value	Emission Factor Units	Hourly Process Rate Value	Hourly Process Rate Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Coating Line Tank B	VOC	Breathing	0.89	lb/Mgal-cap	1.82E-03	Mgal-cap/hr	1.63E-03	7.12E-03
		Working	0.09	lb/Mgal	0.06	Mgal/hr	5.23E-03	0.023
		Total					6.85E-03	0.030
	Total HAP	Breathing	0.73	lb/Mgal-cap	1.82E-03	Mgal-cap/hr	1.34E-03	5.85E-03
		Working	0.08	lb/Mgal	0.06	Mgal/hr	4.29E-03	0.02
		Total					5.63E-03	0.025
Coating Line Tank C	VOC	Breathing	3.82	lb/Mgal-cap	1.82E-03	Mgal-cap/hr	6.94E-03	0.030
		Working	0.34	lb/Mgal	0.07	Mgal/hr	0.025	0.111
		Total					0.032	0.142
	Total HAP	Breathing	3.47	lb/Mgal-cap	1.82E-03	Mgal-cap/hr	6.32E-03	0.028
		Working	0.31	lb/Mgal	0.07	Mgal/hr	0.023	0.101
		Total					0.029	0.129

Storage Tank	Pollutant	Evap. Loss Type	Emission Factor Value	Emission Factor Units	Hourly Process Rate Value	Hourly Process Rate Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Coating Line Tank D	VOC	Breathing	0.53	lb/Mgal-cap	1.82E-03	Mgal-cap/hr	9.62E-04	4.21E-03
		Working	0.06	lb/Mgal	0.03	Mgal/hr	2.19E-03	9.59E-03
		Total					3.15E-03	0.01
	Total HAP	Breathing	0.37	lb/Mgal-cap	1.82E-03	Mgal-cap/hr	6.82E-04	2.99E-03
		Working	0.05	lb/Mgal	0.03	Mgal/hr	1.55E-03	6.80E-03
		Total					2.23E-03	9.78E-03
Coating Line Tank E	VOC	Breathing	0.31	lb/Mgal-cap	1.24E-03	Mgal-cap/hr	3.84E-04	1.68E-03
		Working	0.04	lb/Mgal	0.02	Mgal/hr	8.34E-04	3.65E-03
		Total					1.22E-03	5.33E-03
	Total HAP	Breathing	0.29	lb/Mgal-cap	1.24E-03	Mgal-cap/hr	3.54E-04	1.55E-03
		Working	0.03	lb/Mgal	0.02	Mgal/hr	7.69E-04	3.37E-03
		Total					1.12E-03	4.92E-03
Coating Line Tank F VOC	VOC	Breathing	0.30	lb/Mgal-cap	1.24E-03	Mgal-cap/hr	3.73E-04	1.63E-03
		Working	0.03	lb/Mgal	5.71E-03	Mgal/hr	1.62E-04	7.11E-04
		Total					5.35E-04	2.34E-03
Coating Line Tank F HAP	Total HAP	Breathing	0.14	lb/Mgal-cap	1.24E-03	Mgal-cap/hr	1.79E-04	7.84E-04
		Working	0.01	lb/Mgal	5.71E-03	Mgal/hr	7.81E-05	3.42E-04
		Total					2.57E-04	1.13E-03
Stage 1 Alkaline Cleaning	VOC	Breathing	0.029	lb/Mgal-cap	6.15E-04	Mgal-cap/hr	1.80E-05	7.88E-05
		Working	1.21E-03	lb/Mgal	0.36	Mgal/hr	4.35E-04	1.91E-03
		Total					4.53E-04	1.98E-03
Stage 2 Alkaline Cleaning	VOC	Breathing	0.03	lb/Mgal-cap	6.15E-04	Mgal-cap/hr	1.80E-05	7.88E-05
		Working	1.09E-03	lb/Mgal	0.72	Mgal/hr	7.83E-04	3.43E-03
		Total					8.01E-04	3.51E-03
Coating Line Tank G	VOC	Breathing	2.38	lb/Mgal-cap	1.24E-03	Mgal-cap/hr	2.95E-03	0.01
		Working	0.30	lb/Mgal	0.02	Mgal/hr	5.20E-03	0.02
		Total					8.15E-03	0.04
	Total HAP	Breathing	1.79	lb/Mgal-cap	1.24E-03	Mgal-cap/hr	2.22E-03	9.71E-03
		Working	0.23	lb/Mgal	0.02	Mgal/hr	3.91E-03	0.02
		Total					6.12E-03	0.03

Storage Tank	Pollutant	Evap. Loss Type	Emission Factor Value	Emission Factor Units	Hourly Process Rate Value	Hourly Process Rate Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Paint Day Tank 1	VOC	Breathing	1.13	lb/Mgal-cap	8.32E-05	Mgal-cap/hr	9.40E-05	4.12E-04
		Working	0.02	lb/Mgal	0.03	Mgal/hr	7.39E-04	3.24E-03
		Total					8.33E-04	3.65E-03
	Total HAP	Breathing	0.93	lb/Mgal-cap	8.32E-05	Mgal-cap/hr	7.73E-05	3.38E-04
		Working	0.02	lb/Mgal	0.03	Mgal/hr	6.08E-04	2.66E-03
		Total					6.85E-04	3.00E-03
Paint Day Tank 2	VOC	Breathing	5.24	lb/Mgal-cap	8.32E-05	Mgal-cap/hr	4.36E-04	1.91E-03
		Working	0.09	lb/Mgal	0.07	Mgal/hr	6.74E-03	0.030
		Total					7.18E-03	0.031
	Total HAP	Breathing	4.77	lb/Mgal-cap	8.32E-05	Mgal-cap/hr	3.97E-04	1.74E-03
		Working	0.08	lb/Mgal	0.07	Mgal/hr	6.14E-03	0.027
		Total					6.53E-03	0.029
Paint Day Tank 3	VOC	Breathing	0.66	lb/Mgal-cap	8.32E-05	Mgal-cap/hr	5.49E-05	2.41E-04
		Working	0.01	lb/Mgal	0.03	Mgal/hr	4.32E-04	1.89E-03
		Total					4.87E-04	2.13E-03
	Total HAP	Breathing	0.47	lb/Mgal-cap	8.32E-05	Mgal-cap/hr	3.90E-05	1.71E-04
		Working	8.95E-03	lb/Mgal	0.03	Mgal/hr	3.07E-04	1.34E-03
		Total					3.46E-04	1.51E-03
Paint Day Tank 5	VOC	Breathing	0.17	lb/Mgal-cap	4.53E-05	Mgal-cap/hr	7.55E-06	3.31E-05
		Working	4.57E-03	lb/Mgal	0.01	Mgal/hr	5.22E-05	2.29E-04
		Total					5.97E-05	2.62E-04
	Total HAP	Breathing	0.03	lb/Mgal-cap	4.53E-05	Mgal-cap/hr	1.45E-06	6.35E-06
		Working	8.78E-04	lb/Mgal	0.01	Mgal/hr	1.00E-05	4.39E-05
		Total					1.15E-05	5.03E-05
Paint Day Tank 6	VOC	Breathing	0.35	lb/Mgal-cap	4.53E-05	Mgal-cap/hr	1.58E-05	6.91E-05
		Working	0.02	lb/Mgal	2.28E-03	Mgal/hr	4.79E-05	2.10E-04
		Total					6.37E-05	2.79E-04
	Total HAP	Breathing	0.21	lb/Mgal-cap	4.53E-05	Mgal-cap/hr	9.69E-06	4.24E-05
		Working	0.01	lb/Mgal	2.28E-03	Mgal/hr	2.94E-05	1.29E-04
		Total					3.91E-05	1.71E-04

Storage Tank	Pollutant	Evap. Loss Type	Emission Factor Value	Emission Factor Units	Hourly Process Rate Value	Hourly Process Rate Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Paint Day Tank 7	VOC	Breathing	0.54	lb/Mgal-cap	4.53E-05	Mgal-cap/hr	2.43E-05	1.06E-04
		Working	0.06	lb/Mgal	1.14E-03	Mgal/hr	6.29E-05	2.75E-04
		Total					8.72E-05	3.82E-04
	Total HAP	Breathing	0.45	lb/Mgal-cap	4.53E-05	Mgal-cap/hr	2.05E-05	8.96E-05
		Working	0.05	lb/Mgal	1.14E-03	Mgal/hr	5.30E-05	2.32E-04
		Total					7.35E-05	3.22E-04
Coil Finishing Area Storage Tanks (22) Total	VOC	Breathing					0.014	0.06
		Working					0.048	0.21
		Total					0.062	0.27
	Total HAP	Breathing					0.01	0.05
		Working					0.041	0.18
		Total					0.053	0.23

> Based on the low potential emission rate, as shown above, the 22 storage tanks in the Coil Finishing area can be classified as a group of insignificant activities. As such, they are not included on ADEM Form 108 for Loading and Storage of Organic Compounds. Instead, they are only listed in Section 12 of the ADEM 103 Form for Facility Identification addressing insignificant activities.

34. Paved Haul Roads Potential Emission Calculations

> PM/PM10/PM2.5 emissions from transporting material in significant quantities by haul truck are quantified. The truck traffic information and the meteorological data shown below are used to calculate the potential emissions from plant roadways. Plant roads at the facility used for transporting materials on or off site will be paved and will be swept as necessary to control fugitive dust emissions.

Emission Unit IDs: **AS-25-1**
Emission Unit Descriptions: **Paved Haul Roads**

34.1 Paved Haul Roads Emission Factor Derivation

> The methodologies indicated in AP42 Chapter 13.2.1 were used to quantify the potential particulate emissions generated by truck traffic associated with the Bay Minette facility.

Unmitigated Emission Factor, Ef = [k * (sL)^0.91 * (W)^1.02] — AP-42 Section 13.2.1, Equation 1
Mitigated Emission Factor, Eext = Ef * [1 - (p/4N)] — AP-42 Section 13.2.1, Equation 2

where,
Ef = the dry paved road particulate emission factor (lb/VMT)
Eext = the annual average particulate emission factor extrapolated to account for the emissions control provided by natural precipitation (lb/VMT)
k = particle size multiplier (lb/VMT)
sL = road surface silt loading (g/m2)
W = average weight of vehicles (tons)
p = number of days with greater than 0.01 in. of precipitation per year
N = number of days in averaging period

34.1.1 Vehicle and Site Information

Annual Average Days of Rain, p	117.1	days	Mobile, AL (KMOB) met. station "Normal No. Days w/ Precipitation >0.01 in." from NCDC Local Climatological Data Annual Summary for 2021 for 71 year Period of Record
Number of Days in Averaging Period, N	365	days	
Control Efficiency for Periodic Sweeping	50	%	Ch. 4 AWMA Air Pollution Control Eng. Manual, pg 141

34.1.2 PM Emission Factor Derivation

Parameter	Data when Trucks are Full						Data when Trucks are Empty							Basis
Vehicle Type	Dump Trailer (w/ 15 MT)	Dump Trailer (w/ 18 MT)	Flat Bed Truck (w/ 18 MT)	Heavy Haul Flat Bed	Tanker Truck	Van Trailer (w/ 18 MT)	Dump Trailer (w/ 15 MT)	Dump Trailer (w/ 18 MT)	Flat Bed Truck (w/ 18 MT)	Heavy Haul Flat Bed	Tanker Truck	Van Trailer (w/ 18 MT)		
Particle Size Multiplier, k	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	lb/VMT	AP-42 Table 13.2.1-1
Silt Loading, sL	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	g/m^2	AP-42 Table 13.2.1-2; Based on engineering judgment considering plant roads will be paved, contents of trucks will not add to dust on roadway, and plant is not in a arid region.
Maximum Vehicle Weight, W	34.53	37.84	36.34	48.00	37.34	37.34	18.00	18.00	16.50	18.00	17.50	17.50	tons	Engineering estimate for maximum gross vehicle weight of cab, truck and load
Unmitigated Emission Factor	0.256	0.281	0.270	0.358	0.277	0.277	0.132	0.132	0.121	0.132	0.128	0.128	lb/VMT	= 0.01100 lb/VMT * (0.6 ^ 0.91) * (35 ^ 1.02); Sample calc. for Dump Trailer (w/ 15 MT)
Mitigated Emission Factor	0.236	0.259	0.248	0.330	0.255	0.255	0.121	0.121	0.111	0.121	0.118	0.118	lb/VMT	= 0.256 lb/VMT * (1 - (117 / (4 * 365))); Sample calc. for Dump Trailer (w/ 15 MT)
Controlled, Unmitigated Emission Factor	0.128	0.141	0.135	0.179	0.139	0.139	0.066	0.066	0.060	0.066	0.064	0.064	lb/VMT	= 0.256 lb/VMT * (1 - 50%); Sample calc. for Dump Trailer (w/ 15 MT)
Controlled, Mitigated Emission Factor	0.118	0.129	0.124	0.165	0.128	0.128	0.061	0.061	0.055	0.061	0.059	0.059	lb/VMT	= 0.236 lb/VMT * (1 - 50%); Sample calc. for Dump Trailer (w/ 15 MT)

34.1.3 PM10 Emission Factor Derivation

Parameter	Data when Trucks are Full						Data when Trucks are Empty							Basis
Vehicle Type	Dump Trailer (w/ 15 MT)	Dump Trailer (w/ 18 MT)	Flat Bed Truck (w/ 18 MT)	Heavy Haul Flat Bed	Tanker Truck	Van Trailer (w/ 18 MT)	Dump Trailer (w/ 15 MT)	Dump Trailer (w/ 18 MT)	Flat Bed Truck (w/ 18 MT)	Heavy Haul Flat Bed	Tanker Truck	Van Trailer (w/ 18 MT)		
Particle Size Multiplier, k	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	lb/VMT	AP-42 Table 13.2.1-1
Silt Loading, sL	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	g/m^2	See PM emission factor derivation basis
Maximum Vehicle Weight, W	34.53	37.84	36.34	48.00	37.34	37.34	18.00	18.00	16.50	18.00	17.50	17.50	tons	Engineering estimate for maximum gross vehicle weight of cab, truck and load
Unmitigated Emission Factor	0.051	0.056	0.054	0.072	0.055	0.055	0.026	0.026	0.024	0.026	0.026	0.026	lb/VMT	= 0.00220 lb/VMT * (0.6 ^ 0.91) * (35 ^ 1.02); Sample calc. for Dump Trailer (w/ 15 MT)
Mitigated Emission Factor	0.047	0.052	0.050	0.066	0.051	0.051	0.024	0.024	0.022	0.024	0.024	0.024	lb/VMT	= 0.051 lb/VMT * (1 - (117 / (4 * 365))); Sample calc. for Dump Trailer (w/
Controlled, Unmitigated Emission Factor	0.026	0.028	0.027	0.036	0.028	0.028	0.013	0.013	0.012	0.013	0.013	0.013	lb/VMT	= 0.051 lb/VMT * (1 - 50%); Sample calc. for Dump Trailer (w/ 15 MT)
Controlled, Mitigated Emission Factor	0.024	0.026	0.025	0.033	0.026	0.026	0.012	0.012	0.011	0.012	0.012	0.012	lb/VMT	= 0.047 lb/VMT * (1 - 50%); Sample calc. for Dump Trailer (w/ 15 MT)

34.1.4 PM2.5 Emission Factor Derivation

Parameter	Data when Trucks are Full						Data when Trucks are Empty							Basis
Vehicle Type	Dump Trailer (w/ 15 MT)	Dump Trailer (w/ 18 MT)	Flat Bed Truck (w/ 18 MT)	Heavy Haul Flat Bed	Tanker Truck	Van Trailer (w/ 18 MT)	Dump Trailer (w/ 15 MT)	Dump Trailer (w/ 18 MT)	Flat Bed Truck (w/ 18 MT)	Heavy Haul Flat Bed	Tanker Truck	Van Trailer (w/ 18 MT)		
Particle Size Multiplier, k	0.00054	0.00054	0.00054	0.00054	0.00054	0.00054	0.00054	0.00054	0.00054	0.00054	0.00054	0.00054	lb/VMT	AP-42 Table 13.2.1-1
Silt Loading, sL	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	g/m^2	See PM emission factor derivation basis
Maximum Vehicle Weight, W	34.53	37.84	36.34	48.00	37.34	37.34	18.00	18.00	16.50	18.00	17.50	17.50	tons	Engineering estimate for maximum gross vehicle weight of cab, truck and load
Unmitigated Emission Factor	0.0126	0.0138	0.0132	0.0176	0.0136	0.0136	0.006	0.006	0.006	0.006	0.006	0.006	lb/VMT	= 0.00054 lb/VMT * (0.6 ^ 0.91) * (35 ^ 1.02); Sample calc. for Dump Trailer (w/ 15 MT)
Mitigated Emission Factor	0.0116	0.0127	0.0122	0.0162	0.0125	0.0125	0.006	0.006	0.005	0.006	0.006	0.006	lb/VMT	= 0.013 lb/VMT * (1 - (117 / (4 * 365))); Sample calc. for Dump Trailer (w/
Controlled, Unmitigated Emission Factor	0.0063	0.0069	0.0066	0.0088	0.0068	0.0068	0.003	0.003	0.003	0.003	0.003	0.003	lb/VMT	= 0.013 lb/VMT * (1 - 50%); Sample calc. for Dump Trailer (w/ 15 MT)
Controlled, Mitigated Emission Factor	0.0058	0.0063	0.0061	0.0081	0.0063	0.0063	0.003	0.003	0.003	0.003	0.003	0.003	lb/VMT	= 0.012 lb/VMT * (1 - 50%); Sample calc. for Dump Trailer (w/ 15 MT)

34.1.5 Truck Traffic Calculations by Material, Storage Location, and Truck Type

		When Full	When Empty
Material Type & Storage Area	**Truck Type**	**Maximum Daily Vehicle Miles Traveled** (VMT/day)[1]	**Maximum Daily Vehicle Miles Traveled** (VMT/day)[1]
Outside Bale Receiving	Van Trailer (w/ 18 MT)	151.80	162.43
Outside Bale Receiving	Flat Bed Truck (w/ 18 MT)	167.17	171.87
Dross Loading Dock	Van Trailer (w/ 18 MT)	65.95	65.95
Dross Loading Dock	Flat Bed Truck (w/ 18 MT)	4.50	4.50
Dross Loading Dock	Dump Trailer (w/ 15 MT)	47.96	47.96
Hot Rolling Dock	Heavy Haul Flat Bed	36.26	36.26
Hot Rolling Dock	Flat Bed Truck (w/ 18 MT)	6.40	6.40
Hot Rolling Dock	Tanker Truck	6.40	6.40
Hot Rolling Dock	Van Trailer (w/ 18 MT)	6.40	6.40
Cold Rolling Dock	Heavy Haul Flat Bed	46.33	46.47
Cold Rolling Dock	Tanker Truck	3.10	3.10
Cold Rolling Dock	Van Trailer (w/ 18 MT)	3.10	3.10
Cold Rolling Dock	Flat Bed Truck (w/ 18 MT)	3.10	3.10
Coil Finishing Dock	Flat Bed Truck (w/ 18 MT)	124.32	127.79
Central Stores	Van Trailer (w/ 18 MT)	9.23	9.23
Central Stores	Tanker Truck	9.23	9.23
Central Stores	Van Trailer (w/ 18 MT)	10.55	10.55
Totals		701.8	720.7

[1] Based on measurements taken in GIS software for anticipated truck routes.

34.1.6 Truck Traffic Calculations by Truck Type Only

	When Full	When Empty
Truck Type	**Maximum Daily Vehicle Miles Traveled** (VMT/day)[1]	**Maximum Daily Vehicle Miles Traveled** (VMT/day)[1]
Flat Bed Truck (w/ 18 MT)	314.72	322.89
Van Trailer (w/ 18 MT)	237.80	248.42
Dump Trailer (w/ 15 MT)	47.96	47.96
Heavy Haul Flat Bed	82.60	82.74
Tanker Truck	18.73	18.73
Totals	701.8	720.7

[1] Based on measurements taken in GIS software for anticipated truck routes.

34.2 Summary of Paved Haul Roads Potential Emissions

34.2.1 Summary of Paved Haul Roads Potential Emissions Flat Bed Truck (w/ 18 MT)

						When Full				
	Unmitigated Emission Factor for Short-Term Emissions	Mitigated Emission Factor for Annual Emissions	Controlled Short-Term Emission Factor	Controlled Annual Emission Factor		Maximum Traffic Rate	Uncontrolled Potential Emission Rate		Controlled Potential Emission Rate	
Pollutant	(lb/VMT)	(lb/VMT)	(lb/VMT)	(lb/VMT)	EF Basis	(VMT/day)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
PM	0.26	0.24	0.13	0.12	AP-42, Chp.13.2	314.72	3.36	13.53	1.680	6.77
PM10	0.051	0.047	0.026	0.024	AP-42, Chp.13.2	314.72	0.672	2.707	0.336	1.353
PM2.5	0.0126	0.0116	0.0063	0.0058	AP-42, Chp.13.2	314.72	0.1649	0.664	0.0825	0.3322
						When Empty				
PM	0.13	0.12	0.07	0.06	AP-42, Chp.13.2	322.89	1.77	7.143	0.887	3.5716
PM10	0.026	0.024	0.013	0.012	AP-42, Chp.13.2	322.89	0.355	1.429	0.177	0.7143
PM2.5	0.0065	0.0060	0.0032	0.0030	AP-42, Chp.13.2	322.89	0.0870	0.351	0.0435	0.1753

34.2.2 Summary of Paved Haul Roads Potential Emissions Van Trailer (w/ 18 MT)

						When Full				
	Unmitigated Emission Factor for Short-Term Emissions	Mitigated Emission Factor for Annual Emissions	Controlled Short-Term Emission Factor	Controlled Annual Emission Factor		Maximum Traffic Rate	Uncontrolled Potential Emission Rate		Controlled Potential Emission Rate	
Pollutant	(lb/VMT)	(lb/VMT)	(lb/VMT)	(lb/VMT)	EF Basis	(VMT/day)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
PM	0.28	0.26	0.14	0.13	AP-42, Chp.13.2	237.80	2.7864	11.2254	1.3932	5.6127
PM10	0.056	0.052	0.028	0.026	AP-42, Chp.13.2	237.80	0.5573	2.2451	0.2786	1.1225
PM2.5	0.0138	0.0127	0.0069	0.0063	AP-42, Chp.13.2	237.80	0.1368	0.5511	0.0684	0.2755
						When Empty				
PM	0.13	0.12	0.07	0.06	AP-42, Chp.13.2	248.42	1.364	5.496	0.682	2.748
PM10	0.026	0.024	0.013	0.012	AP-42, Chp.13.2	248.42	0.273	1.099	0.136	0.550
PM2.5	0.0065	0.0060	0.0032	0.0030	AP-42, Chp.13.2	248.42	0.067	0.270	0.033	0.135

34.2.3 Summary of Paved Haul Roads Potential Emissions Dump Trailer (w/ 15 MT)

	When Full									
Pollutant	Unmitigated Emission Factor for Short-Term Emissions (lb/VMT)	Mitigated Emission Factor for Annual Emissions (lb/VMT)	Controlled Short-Term Emission Factor (lb/VMT)	Controlled Annual Emission Factor (lb/VMT)	EF Basis	Maximum Traffic Rate (VMT/day)	Uncontrolled Potential Emission Rate (lb/hr)	(tpy)	Controlled Potential Emission Rate (lb/hr)	(tpy)
PM	0.27	0.25	0.13	0.12	AP-42, Chp.13.2	47.96	0.54	2.17	0.27	1.09
PM10	0.054	0.050	0.027	0.025	AP-42, Chp.13.2	47.96	0.11	0.43	0.054	0.22
PM2.5	0.0132	0.0122	0.0066	0.0061	AP-42, Chp.13.2	47.96	0.026	0.107	0.013	0.053
	When Empty									
PM	0.12	0.11	0.06	0.06	AP-42, Chp.13.2	47.96	0.241	0.971	0.120	0.485
PM10	0.024	0.022	0.012	0.011	AP-42, Chp.13.2	47.96	0.048	0.194	0.024	0.097
PM2.5	0.0059	0.0054	0.0030	0.0027	AP-42, Chp.13.2	47.96	0.012	0.048	0.006	0.024

34.2.4 Summary of Paved Haul Roads Potential Emissions Heavy Haul Flat Bed (w/ 18 MT)

	When Full									
Pollutant	Unmitigated Emission Factor for Short-Term Emissions (lb/VMT)	Mitigated Emission Factor for Annual Emissions (lb/VMT)	Controlled Short-Term Emission Factor (lb/VMT)	Controlled Annual Emission Factor (lb/VMT)	EF Basis	Maximum Traffic Rate (VMT/day)	Uncontrolled Potential Emission Rate (lb/hr)	(tpy)	Controlled Potential Emission Rate (lb/hr)	(tpy)
PM	0.28	0.26	0.14	0.13	AP-42, Chp.13.2	82.597	0.955	3.846	0.477	1.923
PM10	0.055	0.051	0.028	0.026	AP-42, Chp.13.2	82.597	0.191	0.769	0.095	0.385
PM2.5	0.0136	0.0125	0.0068	0.0063	AP-42, Chp.13.2	82.597	0.047	0.189	0.023	0.094
	When Empty									
PM	0.13	0.12	0.06	0.06	AP-42, Chp.13.2	82.736	0.441	1.779	0.221	0.889
PM10	0.026	0.024	0.013	0.012	AP-42, Chp.13.2	82.736	0.088	0.356	0.044	0.178
PM2.5	0.0063	0.0058	0.0031	0.0029	AP-42, Chp.13.2	82.736	0.022	0.087	0.011	0.044

34.2.5 Summary of Paved Haul Roads Potential Emissions Tanker Truck (w/ 18 MT)

	When Full									
Pollutant	Unmitigated Emission Factor for Short-Term Emissions (lb/VMT)	Mitigated Emission Factor for Annual Emissions (lb/VMT)	Controlled Short-Term Emission Factor (lb/VMT)	Controlled Annual Emission Factor (lb/VMT)	EF Basis	Maximum Traffic Rate (VMT/day)	Uncontrolled Potential Emission Rate (lb/hr)	(tpy)	Controlled Potential Emission Rate (lb/hr)	(tpy)
PM	0.28	0.26	0.14	0.13	AP-42, Chp.13.2	18.732	0.217	0.872	0.108	0.436
PM10	0.055	0.051	0.028	0.026	AP-42, Chp.13.2	18.732	0.043	0.174	0.022	0.087
PM2.5	0.0136	0.0125	0.0068	0.0063	AP-42, Chp.13.2	18.732	0.011	0.043	0.005	0.021
	When Empty									
PM	0.13	0.12	0.06	0.06	AP-42, Chp.13.2	18.732	0.100	0.403	0.050	0.201
PM10	0.026	0.024	0.013	0.012	AP-42, Chp.13.2	18.732	0.020	0.081	0.010	0.040
PM2.5	0.0063	0.0058	0.0031	0.0029	AP-42, Chp.13.2	18.732	0.005	0.020	0.002	0.010

35. Anodizing Test Unit

> Aluminum sample sheets are received from the hot mill and then loaded into the anodizer as part of a product quality/R&D testing process. Anodizing refers to the process of converting the surface of a metal part, typically aluminum, into an abrasion and corrosion-resistant oxide layer. Sulfuric acid anodizing is a common method of creating this oxide layer. The anodizer will generate the desired oxide layer on the sample sheets by applying an electric current to the submerged sample sheet within the aqueous sulfuric acid bath that drives the chemical reaction to generate the protective oxide layer on the sheet. After the anodizing process is completed, the metal sheets will be rinsed in deionized (DI) water before being unloaded from the machine. While the primary concerns with this process are for protection of direct exposure to the sulfuric acid being used, the potential for trace PM emissions can be quantified using AP-42 factors for electroplating, as described in detail below.

Emission Unit IDs:	**AS-34-1**
Emission Unit Descriptions:	**Anodizing Test Unit**

35.1 Anodizing Test Unit Processing Rates

> The processing rates are based on cycle time estimates from the manufacturer, and the maximum capacity of the machine.

Maximum aluminum sheet size:	220.46	lb/event	
Approximate anodizing time:	5	min/event	
Maximum aluminum processing rate:	1.32	ton/hr	= 220.5 lb/event / 5 min/event x 60 min/hr / 2,000 lb/ton
Annual aluminum processing rate:	11,587	tpy	= 1.32 ton/hr x 8,760 hr/yr

35.1 Documentation of Emission Factors Used for the Anodizing Test Unit

35.1.1 PM Emissions from Anodizing Test Unit

> PM emissions from the sulfuric acid anodizing process are assumed to be similar to the PM emissions generated by the chromic acid anodizing process described in AP-42 Chapter 12.20 for electroplating.

Parameter	Value	Units	Basis
Total PM Uncontrolled Grain Loading Rate	4.20	gr/hr-ft^2	Per AP-42 Table 12.20-2. Total PM includes filterable and condensable PM. However, condensable PM is likely to be negligible. All PM from chromium electroplating sources is likely to be emitted as PM-10.
Scrubber PM Control Efficiency	99.0%	--	Manufacturer's data
Surface Area of Tank	20.33	ft^2	Design basis of anodizing tank
Controlled Total PM/Total PM10/Total PM2.5 Emission Factor	1.22E-04	lb/hr	4.20 gr/hr-ft2 / 7,000 gr/lb x 20.33 ft2 x (1 -99%) = 1.22E-04 lb/hr
Controlled Total PM/Total PM10/Total PM2.5 Emission Factor (Production Basis)	9.22E-05	lb/ton Al	1.22E-04 lb/hr x 1.32 ton Al/hr = 9.22E-05 lb/ton Al

35.1.2 Sulfuric Acid Emissions Factor Calculation

> Sulfuric acid mist emissions are estimated using the method outlined in "Characterizing Site Specific Source Emissions for EPA's Risk Assessment Tool for the Metal Finishing Industry" by S. Schwartz and M. Lorber as described in a Technical Support Document (TSD) for a Permit to Construct and Operate issued for a similar operation (https://anrweb.vt.gov/PubDocs/DEC/Air/Permits/1509.pdf) using input data supplied by the anodizing test unit and scrubber manufacturer and assuming a chromic acid-based anodizing system emission quantification technique can be used to estimate worst-case emissions for Novelis' sulfuric acid anodizing process.

$$EM_a = [(CC_a \times CD_a) / CE_a] / [(CC_{Cr} \times CD_{Cr}) / CE_{Cr}] \times ER_{Cr} \times A_a$$

where

EM_a =	Emission Rate of Anodizing Tank (lb/hr)
CC_a =	Pollutant Concentration of Anodizing Tank (oz/gal)
CD_a =	Current Density of the Anodizing Process (amp/in^2)
CE_a =	Cathode Efficiency of Anodizing Process
CC_{Cr} =	Chromic Acid Concentration (oz/gal)
CD_{Cr} =	Current Density of Chromic Acid Anodizing Process (amp/in^2)
CE_{Cr} =	Cathode Efficiency of Chromic Acid Anodizing Process
ER_{Cr} =	Pollutant Emission Rate from Chromic Acid Anodizing Process (lb/hr)
A_a =	Surface Area of Anodizing Tank (ft^2)

Parameter	Value	Units	Basis
CC_a = Pollutant Concentration of Anodizing Tank	19.20	oz/gal	Design Basis - 15% of H_2SO_4 in anodizing solution
CD_a = Current Density of the Anodizing Process	0.14	amp/in^2	Maximum Design Basis - 20 amp/ft^2 converted to amp/in^2
CE_a = Cathode Efficiency of Anodizing Process	95%	--	Characterizing Site Specific Source Emissions for EPA's Risk Assessment Tool for the Metal Finishing Industry" by S. Schwartz and M. Lorber.
CC_{Cr} = Chromic Acid Concentration	9.00	oz/gal	Default value based on AP-42 Chapter 12.20 background document and cited in similar source TSD (pg. 16).
CD_{Cr} = Current Density of Chromic Acid Anodizing Process	3.00	amp/in^2	Default value cited in similar source TSD (pg. 16).
CE_{Cr} = Cathode Efficiency of Chromic Acid Anodizing Process	95%	--	Characterizing Site Specific Source Emissions for EPA's Risk Assessment Tool for the Metal Finishing Industry" by S. Schwartz and M. Lorber.
ER_{Cr} = Pollutant Emission Rate from Chromic Acid Anodizing Process	5.81E-03	lb/hr	AP-42: Table 12.20.2 Emission Factors for Chromic Acid Anodizing (2 gr Cr/hr-ft^2) multiplied by Novelis' anodizing test unit tank surface area converted to lb/hr
A_a = Surface Area of Anodizing Tank	20.33	ft^2	Design basis of anodizing tank
EM_a = Emission Rate of Anodizing Tank	0.012	lb/hr	[19.2 oz/gal x 0.14 amp/in2 / 95%] / [9.0 oz/gal x 3.0 amp/in2 / 95%] x 5.81E-03 lb/hr x 20.33 ft2 = 0.012 lb/hr
Controlled H_2SO_4 Emission Factor (Production Basis)	8.82E-03	lb H_2SO_4 / ton Al	0.012 lb/hr x 1.32 ton Al/hr = 0.009 lb H2SO4 / ton Al

35.2 Potential Emission Calculations for Anodizing Test Unit

> Hourly potential emissions are calculated using the emission factor and maximum hourly process rate. Annual potential emissions are calculated using the emission factor and maximum annual process rates based on continuous operation at the short-term potential process rate.

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	9.22E-05 lb/ton Al	AP-42 Chp. 12.20	1.32	11,587	1.22E-04	5.34E-04
PM10	9.22E-05 lb/ton Al	AP-42 Chp. 12.20	1.32	11,587	1.22E-04	5.34E-04
PM2.5	9.22E-05 lb/ton Al	AP-42 Chp. 12.20	1.32	11,587	1.22E-04	5.34E-04
H2SO4	8.82E-03 lb/ton Al	Schwartz and Lober	1.32	11,587	0.012	0.051

36. Filtering Aid Material Handling

> During the hot and cold rolling processes, surface metals, dirts and impurities that are on the sheet will wash or rinse off in the recirculating coolant systems as the aluminum sheet passes through the metal rollers. The accumulated solids are separated and removed from the recirculating coolant and settle in closed process storage tanks. This sludge must then be removed through a filtering process before the solid waste can be sent off-site for disposal. Filtering aid (e.g., diatomaceous earth and Fuller's earth) used in the multiplate filter is mixed with a coolant via a mixing tank with a manually accessed hatch. Up to two times per day the two types of filtering aid are dumped into the mixing tank through the hatch. The liquid coolant in the tank prevents dust from being emitted through the hatch so that the only source of the emissions occur from the dropping of the filtering aid out of the bags onto the liquid coolant surface. These PM emissions from the "drop point" are fugitive and released into the building.

Emission Unit IDs: **AS-35-1**
Emission Unit Descriptions: **Filtering Aid Material Handling**

36.1 Filtering Aid Material Handling Process Rates

36.1.1 Filtering Aid Throughput

> The particulate emissions are a function of the amount of filtering material poured into the tank during a batching event. The maximum throughput of filtering material can be calculated from the design specifications of the multiplate filter and worst case estimates.

Diatomaceous earth usage:	551.2	lbs/batch	
Fullers earth usage:	551.2	lbs/batch	
Batches per day:	2	batches/day	
Daily total throughput:	2,205	lbs/day	= (551.16 lbs/batch + 551.16 lbs/batch) x 2 batches/day
Total filtering aid hourly process rate:	0.046	tons/hr	= 2,205 lbs/day / 2,000 lbs/ton / 24 hrs/day
Total filtering aid annual process rate:	402.3	tons/hr	= 2,205 lbs/day x 365 days/yr / 2,000 lbs/ton

36.2 Documentation of Emission Factors Used for Filtering Aid Material Handling

> The filterable (filt.) PM emission factor is presented based on the equations presented in EPA's AP-42 Ch. 13.2.4 Aggregate Handling and Storage Piles and converted to a lb/SCC unit basis (i.e., lb/ton filtering aid).

> No condensable PM emissions are generated from this process as the filtering aid does not include any vapors with the possibility of forming condensable PM and the filtering aid and coolant are stored at or near ambient temperatures (i.e., no hot process to generate condensable PM precursor compounds in the vapor phase).

Parameter	Value	Units	Basis
Stack Emissions			
Nominal Wind Speed	5.0	mph	Assumed maximum crossflow of wind inside the Cold Mill building based on engineering judgement
Moisture Content of Filtering Aid	1.0	moist. frac.	Engineering estimate for filtering aid moisture content based on candidate supplier specifications
Filt. PM30 Particle Size Multiplier	0.74	--	AP-42 13.2.4 Aggregate Handling and Storage Piles Particle Size Multipliers. Assuming that all PM is less than 30 microns in size.
Filt. PM10 Particle Size Multiplier	0.35	--	AP-42 13.2.4 Aggregate Handling and Storage Piles Particle Size Multipliers
Filt. PM2.5 Particle Size Multiplier	0.053	--	AP-42 13.2.4 Aggregate Handling and Storage Piles Particle Size Multipliers
Controlled Filt. PM Emission Factor (Production Basis)	0.00625	lb PM/ton filtering aid	0.74 x (0.0032) x (5/5)^1.3 / (1/2)^1.4 = 0.00625 lb filt. PM/ton filtering aid
Controlled Filt. PM10 Emission Factor (Grain Loading Basis)	0.00296	lb PM10/ton filtering aid	0.35 x (0.0032) x (5/5)^1.3 / (1/2)^1.4 = 0.00296 lb filt. PM10/ton filtering aid
Controlled Filt. PM10/PM2.5 Emission Factor (Production Basis)	0.00045	lb PM2.5/ton filtering aid	0.053 x (0.0032) x (5/5)^1.3 / (1/2)^1.4 = 0.00045 lb filt. PM2.5/ton filtering aid

36.3 Potential Emission Calculations for Filtering Aid Material Handling

> Hourly potential emissions are calculated using the emission factor and maximum hourly process rate. Annual potential emissions are calculated using the emission factor and maximum annual process rates based on continuous operation at the short-term potential process rate.

36.3.1 Potential Emissions from Filtering Aid Material Handling

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (tpy)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.00625 lb/ton	AP-42 Ch. 13.2.4	0.046	402.3	2.87E-04	1.26E-03
PM10	0.00296 lb/ton	AP-42 Ch. 13.2.4	0.046	402.3	1.36E-04	5.95E-04
PM2.5	0.00045 lb/ton	AP-42 Ch. 13.2.4	0.046	402.3	2.06E-05	9.00E-05

37. Cold Mill Coil Marking Machine

> The coils produced by the cold mill will be marked with an ink that may contain small amount of organics for identification.
> Low levels of VOC emissions may occur due to potential volatilization of organic compounds in the inks and solvents that will be used to apply the marking directly to the warm exterior surface of the coil that was just completed by the mill. These emissions will be released into the Cold Mill building as fugitives.

Emission Unit IDs: **AS-36-1**
Emission Unit Descriptions: **Cold Mill Coil Marking Machine**

37.1 Cold Mill Coil Marking Machine Application Rates

> The emissions are estimated from the volumetric flow of ink to be applied to the coil. It is assumed that solvent will be used at the same rate as the ink as a conservative estimate for worst-case solvent usage.

Hourly ink application rate:	0.05	gal/hr	
Annual ink application rate:	438	gal/yr	= 0.05 gal/hr x 8,760 hr/yr
Hourly solvent application rate:	0.05	gal/hr	
Annual solvent application rate:	438	gal/yr	= 0.05 gal/hr x 8,760 hr/yr

37.2 Documentation of Emission Factors Used for the Cold Mill Coil Marking Machine

> The potential emission factor derivations for select pollutants generated by the use of the ink and solvent are shown here. It is assumed that all VOC present in the solvent or ink will volatize for a conservative estimation of emissions.

37.2.1 VOC Emission Factor for Ink

Parameter	Value	Units	Basis
VOC Content in Ink	5.88	lb VOC/gal	Per manufacturer SDS. Assuming 100% volatilization of VOC contents.

37.2.2 VOC Emission Factor for Solvent

Parameter	Value	Units	Basis
VOC Content in Ink	6.61	lb VOC/gal	Per manufacturer SDS. Assuming 100% volatilization of VOC contents.

37.3 Potential Emission Calculations for Cold Mill Coil Marking Machine

> Hourly potential emissions are calculated using the emission factor and maximum hourly process rate. Annual potential emissions are calculated using the emission factor and maximum annual process rates based on continuous operation at the short-term potential process rate.

37.3.1 Potential Emissions from Ink Usage

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (gal/hr)	Maximum Annual Process Rate (gal/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
VOC	5.88 lb/gal	Manufacturer SDS	0.05	438	0.29	1.29

37.3.2 Potential Emissions from Solvent Usage

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (gal/hr)	Maximum Annual Process Rate (gal/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
VOC	6.61 lb/gal	Manufacturer SDS	0.05	438	0.33	1.45

38. Mill Roll Grinding Machines

> The metal rolls used in the cold and hot mills will wear down over time and develop burs and imperfections. To keep the highest standard of finished coil product quality, these rolls must be ground down periodically in order to create the smooth surface that the rolls need for the aluminum rolling process. This is done by the use of three (3) roll grinding machines. These machines operate as a circular grinder with a grinding blade that is lubricated and cooled via a water-based coolant emulsion. The emulsion is also used to carry the removed metal down into a trough which collects the coolant as well as the ground metal in order to prevent the ground metal fines from being released into the air. The coolant emulsion is filtered and reused via the use of gravity filtration and filtration papers.

> The coolant emulsion prevents the metal fines from being released into the air in the form of PM emissions as this is inherently a fully contained wet process.

> VOC emissions may be potentially released from the coolant emulsion. The emulsion is approximately 4% of a cutting oil mixed with water.

Emission Unit IDs:	**AS-37-1**
Emission Unit Descriptions:	**Mill Roll Grinding Machines (3)**

38.1 Mill Roll Grinding Machines Application Rates

> The emissions are estimated from the volumetric flow of coolant emulsion applied to the rolls. The processing rates shown here are based on one machine. Each machine is capable of grinding different sized rolls; however, the machine emissions are conservatively estimated based off of the largest roll grinding machines to estimate conservative emissions for all machines.

Hourly coolant application rate:	95	gal/hr	
Cutting oil concentration in coolant:	4%		
Hourly cutting oil application rate:	3.80	gal/hr	= 95 gal/hr x 4%
Hourly roll processing rate:	1	hr/roll	
Annual rolls processed:	8,760	roll/yr	
Annual cutting oil application rate:	33,288	gal/yr	= 4 gal/hr x 1 hr/roll x 8,760 roll/yr

38.2 Documentation of Emission Factors Used for the Mill Roll Grinding Machines

> VOC emissions are generated by the use of the cutting oil in the coolant emulsion. All VOC present in the cutting oil is assumed to evaporate. In reality the cutting oil used is not intended to evaporate easily, so these VOC estimates should be very conservative.

38.2.1 VOC Emission Factor

Parameter	Value	Units	Basis
VOC Content in Oil	0.09	lb VOC/gal	Per manufacturer SDS according to ASTM E1868-10. Assuming 100% volatilization of VOC contents.

38.3 Potential Emission Calculations for Mill Roll Grinding Machines

> Hourly potential emissions are calculated using the emission factor and maximum hourly process rate. Annual potential emissions are calculated using the emission factor and maximum annual process rates based on continuous operation at the short-term potential process rate.

38.3.1 Potential Emissions for Roll Grinding Machines

Pollutant	Emission Factor		Emission Factor Basis	Maximum Hourly Process Rate (gal/hr)	Maximum Annual Process Rate (gal/yr)	Potential Emission Rate per Machine (lb/hr)	Potential Emission Rate per Machine (tpy)	Total Potential Emissions (lb/hr)	Total Potential Emissions (tpy)
VOC	0.09	lb/gal	Manufacturer SDS	3.80	33,288	0.32	1.42	0.97	4.25

39. Coil Finishing Roll Grinding Machine

> The polyurethane rolls used in the Coil Finishing process area develop burs and collect metal fines from use and require a periodic grinding process to prepare the rolls for reuse. In order to process coils properly and to meet customer quality specifications for potential surface/appearance imperfections, the rolls must be smooth at the point of contact with the roller and the metal sheet. The rubber roll grinding machine is used to remove these burs and smooth imperfections from the coil finishing rolls. The rubber roll grinding machine uses a rotating grinding wheel/cutting head to remove a small amount of material from the surface of the polyurethane rolls. The grinding wheel uses a dry cutting process with no lubricant/coolant added. Rubber fines and PM emissions are collected at the roll interface via an integrated dust collection (suction) system, and the collected rubber fines are removed in a product collection cyclone equipped with an integral filtration unit.

> The integral cyclone/filtration unit will be installed to simultaneously allow for rubber fines and PM emissions to be captured, collected, and controlled from the operation. The operation will inherently produce PM emissions via the grinding of the rolls. Polyurethane and grinding wheel particulates will be captured via the dust collection system. The cyclone will separate out the roll grinding material for storage in an anti-explosion drum before being sent off-site for disposal. Suction/pneumatic conveyance air discharged from the cyclone fan will be routed through the filtration unit which will remove additional PM before being discharged to the atmosphere via a dedicated stack.

Emission Unit IDs: **AS-38-1**
Emission Unit Descriptions: **Coil Finishing Roll Grinding Machine**

39.1 Coil Finishing Roll Grinding Machine Process Rates

39.1.1 Roll Processing Capacity

> The roll grinder emissions are predominantly a function of the number of rolls processed and the amount of material removed per grinding event. The theoretical maximum throughput of rolls can be conservatively calculated from the design specifications of the roll grinding machine and worst case estimates at continued steady-state operations.

Minimum roll grinding time for a single roll:	1.5	hr/roll	
Maximum hourly roll processing rate:	0.67	roll/hr	
Maximum annual roll processing rate:	5,840	roll/yr	= 0.67 roll/hr x 8,760 hrs/yr

39.2 Documentation of Emission Factors Used for Roll Grinding

> The filterable (filt.) PM emission factor is presented as the expected exit grain loading associated with the integral cyclone/filtration unit converted to a production normalized basis (lb/roll) using the design of the roll grinding machine.

> A filterable PM collection test was performed by the vendor of the integral cyclone for a high inlet loading scenario (50 lb/hr) with a particle size distribution between 10 to 100 micron particles to derive estimated exit grain loading for worst-case operation of the integral cyclone in a roll grinding application. The filtratio unit has a specification for achieving a 99+% PM removal efficiency for particles down to 5 microns, which would further reduce the PM exit grain loading achieved in the cyclone by up to this same 99% level. Therefore, Novelis assumes the overall cyclone/filtration unit will achieve the same nominal filterable PM emissions performance/exit grain loading (0.01 gr/dscf) as a well performing fabric filter noted in EPA's Air Pollution Control Technology Fact Sheets for Cartridge Collectors (https://www.epa.gov/sites/default/files/2020-08/documents/ff-cartr.pdf) and Baghouses (https://nepis.epa.gov/Exe/ZyPDF.cgi/P100RQ6L.PDF?Dockey=P100RQ6L.PDF). It is conservatively assumed that all filterable PM = PM10 = PM2.5.

> No condensable PM emissions are generated by the dry roll grinding process.

Parameter	Value	Units	Basis
Stack Emissions			
Controlled Filt. PM Emission Factor (Grain Loading Basis)	0.01	gr/dscf	Estimated exit grain loading of integral cyclone/filtration unit informed by vendor specifications and EPA reference literature for similar control devices
Cyclone/Filter Exhaust Flow (Actual Conditions)	1,800	acfm	Cyclone design basis
Cyclone/Filter Exhaust Temperature	70	deg F	Cyclone design basis
Cyclone/Filter Exhaust Flow (Standard Conditions)	1,793	dscfm	1,800 acfm x (460 + 68 deg. F)/(460 + 70 deg. F) = 1,793 dscfm

Parameter	Value	Units	Basis
Controlled Filt. PM/PM10/PM2.5 Emission Factor (Production Basis)	0.231	lb/roll	0.010 gr filt. PM/dscf x 1,793 dscf/min x 60 min/hr x 1 lb / 7,000 gr x 1 / 0.67 roll/hr = 0.231 lb cont. filt. PM/roll

39.3 Potential Emission Calculations for Roll Grinding Machine

> Hourly potential emissions are calculated using the emission factor and maximum hourly process rate. Annual potential emissions are calculated using the emission factor and maximum annual process rates based on continuous operation at the short-term potential process rate.

39.3.1 Potential Emissions from Roll Grinding

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (roll/hr)	Maximum Annual Process Rate (roll/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	0.231 lb/roll	Vendor specifications	0.667	5,840.0	0.15	0.67
PM10	0.231 lb/roll	Vendor specifications	0.667	5,840.0	0.15	0.67
PM2.5	0.231 lb/roll	Vendor specifications	0.667	5,840.0	0.15	0.67

40. Bearings Washing Machine

> Various machine bearings used in the rolling mill process will accumulate grease and dirt over time. These will be cleaned via a bearings washing machine. The washing machine will store a specialized cleaning solution. The used solution passes through a filtration/treatment process and will be reused until fresh cleaning fluid is needed. When replacement is needed, the cleaning solution reservoir can be replenished and the spent cleaning fluid will be disposed of as waste.

> Low levels of VOC emissions may occur due to volatilization of VOC-containing compounds in the aqueous, detergent like cleaning fluid. A demister is installed on the washing machine's exhaust to mitigate the potential for any liquid cleaning solution mist/droplets emissions that may be generated with a 90% removal efficiency.

Emission Unit IDs:	**AS-39-1**
Emission Unit Descriptions:	**Bearings Washing Machine**

40.1 Bearings Washing Machine Wash Rates

> Emissions are estimated from the number of washes per year which are estimated based on the maximum hourly wash rate assuming continuous operation assumptions for gallons used and duration for each wash at sustained steady-state continuous operations. In practice, the number of wash cycles will be determined based on the number of bearings batches requiring cleaning as a function of mill operating time and bearing life in the mills. Novelis estimates a maximum actual annual wash requirement may only be 200 wash/yr demonstrating the infrequent and intermittent operating profile for this maintenance related equipment.

Gallons used per wash:	1,750	gal/wash	
Nominal wash cycle time:	0.50	hr/wash	
Hourly wash rate:	2.0	wash/hr	
Annual wash rate:	17,520	wash/yr	= 2.0 wash/hr x 8,760 hr/yr

40.2 Documentation of Emission Factors Used for the Bearings Washing Machine

> The potential emission factor derivations for select pollutants generated by the use of cleaning fluid at the bearings washing machine are shown here for reference. The bearings washing machine is equipped with a demister that includes a stack discharging into the building.

40.2.1 VOC Emission Factor

> VOC emissions were estimated using the formulation of the cleaning solution and chemical composition of the alkaline spray cleaner [HOUGHTO-CLEAN(HC)™ 8131 or equivalent] with associated loss rates to the air phase from laboratory studies involving similar detergent-like cleaning chemicals in the residential/commercial laundry sectors. The worst-case (high release condition) from these laundry detergent usage studies are expected to provide adequately representative data for the fate and transport of the same chemicals contained in the bearings washing machine's alkaline cleaner.

> For the technical data of the alkaline cleaner, only the organic compounds (non-HAP glycol ethers and amino alcohols) acting as solvents and cleaners/corrosion inhibitors were considered to have losses to the air phase. All other alkaline cleaner ingredients listed on the SDS are non-volatile surfactants, emulsifiers, stabilizers, and anti-foaming agents that would not contribute to VOC emissions formation.

Parameter	Value	Basis
Cleaning Solution (Water+Alk. Cleaner) Usage Rate	1,750 gal/wash	Design specification for bearings washing machine for total amount of recirculating cleaning solution during a washing event
Alk. Cleaner (HC8131) Max. Concentration in Cleaning Solution	10% vol.%	HC8131 Technical Data Sheet
Alk. Cleaner (HC8131) Usage Rate (Vol. Basis)	175 gal/wash	= 1,750 gal clean sol./wash x 10% max. conc. (vol.%) HC8131 in clean sol.
Alk. Cleaner (HC8131) Density	8.67 lb/gal	HC8131 SDS density (1.0385 g/cm^3) converted to lb/gal
Alk. Cleaner (HC8131) Usage Rate (Mass Basis)	1,517 lb/wash	= 175 gal HC8131/wash x 8.67 lb/gal
(2-methoxymethylethoxy)propanol (CAS. No. 34590-94-8) Conc. In Alk. Cleaner (HC8131)	10% wt.%	HC8131 SDS Section 3. Composition/information on ingredients
(2-methoxymethylethoxy)propanol Usage Rate (Mass Basis)	151.7 lb/wash	= 1,517 lb HC8131/wash x 10% max. conc. (wt.%) (2-methoxymethylethoxy)propanol in HC8131
(2-methoxymethylethoxy)propanol Loss % to Air Phase	0.0112% %wt.	Point of Use Emissions High Release Condition from "Table 2. - Summary of Calculated Emission Factors for Liquid Laundry Detergent Component Compounds" in *Calculation of Component Chemical Air Emission Factors for: Hand Dishwashing Detergents, Liquid Laundry Detergent, Liquid Fabric Softener -Executive Summary* published by the Soap and Detergent Association August 2007 (herein referred to as "Detergent Study")
(2-methoxymethylethoxy)propanol Emission Rate	0.017 lb/wash	= 151.7 lb (2-methoxymethylethoxy)propanol/wash x 0.0112% wt.% (2-methoxymethylethoxy)propanol to air phase
2-aminoethanol (MEA) (CAS. No. 141-43-5) Conc. In Alk. Cleaner (HC8131)	2.5% wt.%	HC8131 SDS Section 3. Composition/information on ingredients
2-aminoethanol (MEA) Usage Rate (Mass Basis)	37.9 lb/wash	= 1,517 lb HC8131/wash x 2.5% max. conc. (wt.%) MEA in HC8131
2-aminoethanol (MEA) Loss % to Air Phase	0.0090% %wt.	Point of Use Emissions High Release Condition from Table 2 of Detergent Study
2-aminoethanol (MEA) Emission Rate	0.0034 lb/wash	= 37.9 lb MEA/wash x 0.0090% wt.% MEA to air phase
Uncontrolled VOC Emission Factor (Wash Basis)	0.20 lb VOC/wash	= 0.017 lb (2-methoxymethylethoxy)propanol/wash + 0.0034 lb MEA/wash x 10X safety factor; Safety factor conservatively applied to account for any possible differences in loss rate to air phase in industrial washing cabinet application vs. residential/commercial laundry application

40.3 Potential Emission Calculations for Bearings Washing Machine

> Hourly potential emissions are calculated using the emission factor and estimated hourly wash rate. Annual potential emissions are calculated using the emission factor and annual wash rate.

40.3.1 Potential Emissions from Bearings Washing Machine

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (wash/hr)	Maximum Annual Process Rate (wash/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
VOC	0.20 lb/wash	Engineering Estimate	2.00	17,520	0.41	1.79

41. Hot Mill Parts Washing Bay

> Various parts in the hot mill will accumulate grease and dirt over time. The parts that cannot be easily washed using the various parts washers available will be cleaned in the Hot Mill Parts Washing Bay. The washing bay will use a specialized cleaning solution. The used cleaning solution will be collected and disposed of as waste.

> Low levels of VOC emissions may occur due to volatilization of compounds in the aqueous, detergent like cleaning fluid. These emissions will be released into the building as fugitives.

Emission Unit IDs: **AS-40-1**

Emission Unit Descriptions: **Hot Mill Parts Washing Bay**

41.1 Hot Mill Parts Washing Bay Wash Rates

> The emissions are estimated from the volumetric flow of alkaline cleaner which is estimated from worst case engineering judgement and wash bay design and parts cleaning practices. The annual wash time is inherently limited by the number of larger parts requiring washing produced in the rolling mills. The maximum estimate of 1,500 hr/yr is informed by Novelis' extensive experience with managing maintenance activities in its existing network of U.S. rolling mills.

Hourly cleaning fluid flow rate:	12 gal/hr	
Maximum annual wash time:	1,500 hr/yr	
Annual cleaning fluid flow rate:	18,000 gal/yr	= 12 gal/hr x 1,500 hr/yr

41.2 Documentation of Emission Factors Used for the Hot Mill Parts Washing Bay

> The potential VOC emission factor derivation for VOC emissions generated by the use of cleaning fluid at the Hot Mill Parts Washing Bay are shown here for reference. Although this cleaning fluid is meant to be diluted with water, the dilution rate was not considered for a more conservative estimation. All VOC in the cleaning fluid is assumed to evaporate through the pressure washing process associated with the washing bay although other non-air phase fates for the cleaning fluid are likely to occur in practice (e.g., discharges to wastewater system).

41.2.1 VOC Emission Factor

Parameter	Value	Basis
VOC Content in Cleaning Concentrate	0.20 lb VOC/gal	Per manufacturer SDS according to ASTM E1868-10. Assuming 100% volatilization of VOC content.

41.3 Potential Emission Calculations for Hot Mill Parts Washing Bay

> Hourly potential emissions are calculated using the emission factor and estimated hourly wash rate. Annual potential emissions are calculated using the emission factor and annual wash rate.

41.3.1 Potential Emissions from Hot Mill Parts Washing Bay

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (gal/hr)	Maximum Annual Process Rate (gal/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
VOC	0.20 lb/gal	Manufacturer SDS	12.00	18,000	2.40	1.80

42. Solvent-Containing Parts Washers

> Several small solvent-containing parts washers will be located in operating and maintenance area support shops to clean small hand tools and various small process-related equipment components and parts as part of routine maintenance activities. When cleaning is needed, there are seven (7) maintenance washers and four (4) roll shop drum mounted washers. Cleaning fluid will be stored in the washer's reservoir for use and is recirculated through a lavatory/sink with faucet that is located on top of the parts washer's solvent basin. The fluid passes through a filter and will be reused until fresh cleaning fluid is needed. When replacement is needed, the reservoir will be emptied and the remaining spent cleaning fluid and filters will be disposed of as waste.

> There are four (4) washers in the roll shop. The roll shop drum mounted washers use a specialized cleaning fluid for breaking down emulsions.

> Of the seven (7) maintenance washers, three (3) of these washers are located in the central maintenance areas for the truck shop, machine shop, and mechanical shop use. Two (2) washers are located in the Coil Finishing area for CCL maintenance and edge trimmer maintenance. The remaining two (2) washers are located in the hot mill/cold mill maintenance shop and the cast house's mold shop. The maintenance washers will use a petroleum distillate-based cleaning fluid with citrus to clean the parts.

> Low levels of VOC emissions may occur due to volatilization/evaporation of compounds in the cleaning fluid when the lid of the washer is open or exposed to the interior of the building from those areas where they are located. These emissions will be released into the various production building locations as fugitives.

Emission Unit IDs:	**AS-41-1**
Emission Unit Descriptions:	**Roll Shop Parts Washers (4)**

Emission Unit IDs:	**AS-42-1**
Emission Unit Descriptions:	**Maintenance Parts Washers (7)**

42.1 Cleaning Fluid Usage

> The emissions are estimated from the maximum cleaning fluid used to wash parts which is based off of worst case engineering judgement.

42.1.1 Roll Shop Parts Washers Throughput

Number of drum mounted parts washers:	4.0	washers	
Gallons used per wash:	1.32	gal/wash	
Annual wash rate:	1,000	wash/yr	
Hourly wash rate:	0.114	wash/hr	1,000 wash/yr / 8,760 hr/yr
Annual fluid usage rate:	1,321	gal/yr	1.32 gal/wash x 1,000 wash/hr
Hourly fluid usage rate:	0.151	gal/hr	1,321 wash/yr / 8,760 hr/yr

42.1.2 Maintenance Parts Washers Throughput

Number of base-mounted parts washers:	7.0	washers	
Washer reservoir:	81.50	gal	
Cleaning fluid replacement rate:	1.55	event/yr	
Annual fluid usage rate:	126.12	gal/yr	81.50 gallons x 2 replacement event/yr
Hourly fluid usage rate:	0.0144	gal/hr	126.12 gal/yr / 8,760 hr/yr

42.2 Documentation of Emission Factors Used for Small Parts Washers

> The potential emission factor derivations for select pollutants generated by the use of cleaning fluid at the small parts washers are shown here for reference.

42.2.1 VOC Emission Factor for Roll Shop Parts Washers

> Although this cleaning fluid is meant to be diluted with water, the dilution rate was not considered for a more conservative estimation of VOC emissions from evaporative losses. All VOC in the cleaning fluid is conservatively assumed to evaporate during the washing event.

Parameter	Value		Basis
Cleaning Fluid Usage Rate-Based Emission Factor	0.20	lbs VOC/gal	Per manufacturer SDS according to ASTM E1868-10. Assuming 100% volatilization of VOC contents.

42.2.2 VOC Emission Factor for Maintenance Parts Washers

Parameter	Value	Basis
VOC Evaporative Rate	0.10 lb VOC/hr	EPA Eq. 3-23 from EPA's EIIP Volume II Chapter 16 to estimate the evaporative emissions assuming that all evaporative emissions are non-exempt VOCs
Cleaning Fluid Usage Rate-Based Emission Factor	6.89 lb VOC/gal cleaning fluid	0.10 lb VOC/hr / 0.014 gal/hr = 6.89 lb VOC/gal cleaning fluid

42.3 Potential Emission Calculations for Small Parts Washers

> Hourly potential emissions are calculated using the emission factor and estimated hourly fluid usage rate. Annual potential emissions are calculated using the emission factor and annual fluid usage rate.

42.3.1 Potential Emissions from Roll Shop Parts Washers

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (gal/hr)	Maximum Annual Process Rate (gal/yr)	Potential Emission Rate per Parts Washer (lb/hr)	Potential Emission Rate per Parts Washer (tpy)	Total Potential Emissions (lb/hr)	Total Potential Emissions (tpy)
VOC	0.20 lb/gal	Manufacturer SDS	0.15	1,321	0.03	0.13	0.12	0.53

42.3.2 Potential Emissions from Maintenance Parts Washers

Pollutant	Emission Factor	Emission Factor Basis	Maximum Hourly Process Rate (gal/hr)	Maximum Annual Process Rate (gal/yr)	Potential Emission Rate per Parts Washer (lb/hr)	Potential Emission Rate per Parts Washer (tpy)	Total Potential Emissions (lb/hr)	Total Potential Emissions (tpy)
VOC	6.89 lb/gal	EPA's EIIP Volume II Chapter 16	0.0144	126.12	0.10	0.43	0.69	3.04

43. Wastewater Treatment Process Emissions Summary

> The Wastewater Treatment Plant (WWTP) process area includes the necessary on-site equipment to remove processing oils and other contaminants (i.e., hydrocarbons, metals, particulate, TSS, BOD, etc.) from the hot and cold rolling mills' and coating line cooling water systems via the use of separation, settling, neutralization/buffering, filtration and membrane batch reactor processes before routing it to the local POTW for final treatment and discharge. The incoming wastewater streams are not significant sources of regulated air pollutant emissions because any chemical compounds present as contaminants in the wastewater are not HAP and have low vapor pressures/high boiling points. Any dry material handling processes are either fully enclosed/closed loop or are mixed with wastewater in a manner that prevents the potential for exposure to the atmosphere in such a way that PM emissions could be generated. To demonstrate negligible VOC emissions are associated with the WWTP, Novelis has made an effort to conservatively quantify potential emissions from the sources most likely to contain the liquids with the highest organic concentrations within the WWTP processes that would represent the highest potential for the possibility of VOC formation. Novelis has identified the following process units with this highest VOC emissions generating potential as follows: 1) two (2) Hot Mill fixed roof storage tanks for separated rolling oils/coolants, 2) one Cold Mill fixed roof storage tank for storing water-oil emulsion coolant separated from the wastewater, 3) one Dissolved Air Flotation (DAF) unit to remove the solids and free oils coming from the hot mill wastewater, and 4) one DAF unit for processing cold mill wastewater.

> The WWTP Hot Mill and Cold Mill Oil storage tank emission calculations and Hot Mill and Cold Mill DAF liquid surface evaporative losses were developed using TankESP®. Potential emission calculations for the WWTP operations modeled as storage tanks rely on a set number of parameters for each tank including service type, roof type, tank color, tank dimensions, roof fittings, pressure settings, bulk liquid storage temperature, throughput and more. A complete summary of these parameters for the Hot Mill Oil Tank, Cold Mill Oil Tank, Hot Mill DAF, and Cold Mill DAF (qualifying as insignificant emission units) can be found in TankESP® reports on an individual tanks basis as electronic attachment, upon request by ADEM.

Emission Unit IDs:	**AS-43a-1 & AS-43a-2**
Emission Unit Descriptions:	**WWTP- Hot Mill Oil Tanks (2)**
Emission Unit IDs:	**AS-43b-1 & AS-43b-2**
Emission Unit Descriptions:	**WWTP- Cold Mill Oil Tank**
Emission Unit IDs:	**AS-43c-1**
Emission Unit Descriptions:	**WWTP- Hot Mill DAF**
Emission Unit IDs:	**AS-43d-1**
Emission Unit Descriptions:	**WWTP- Cold Mill DAF**

43.1 Storage Tank and DAF Design Details

Emission Unit ID	Emission Unit Description	Contents	Orientation	Storage Capacity (gal)	Max. Hourly Throughput (Mgal/hr)	Max. Annual Throughput (Mgal/yr)	Tank Diameter (ft.)	Tank Height/ Length (ft.)
AS-43a-1	WWTP- Hot Mill Oil Tanks (2)	HFM Coolant Surrogate	V	10,000	0.059	520	12.1	14.0
AS-43b-1	WWTP- Cold Mill Oil Tank	TCM Coolant Surrogate	V	20,000	0.104	913	12.0	25.7
AS-43c-1	WWTP- Hot Mill DAF	Wastewater and HFM Coolant Surrogate	H	6,058	2.70	23,652	6.1	27.6
AS-43d-1	WWTP- Cold Mill DAF	Wastewater and TCM Coolant Surrogate	H	6,058	2.10	18,396	6.1	27.6

43.2 Stock (Material Stored) Properties

43.2.1 HFM Coolant Surrogate Properties

Physical/Chemical Property	Value		Basis
Density:	7.74	lb/gal	Density of LMC-xx (or equivalent) base rolling oil for water/oil emulsion coolant supplied to HFM
Molecular Weight - Liquid:	376.7	lb/lbmol	TankESP speciation profile for HFM Coolant Surrogate (pentadecane, C15H33, CAS No. 629-62-9)
Molecular Weight - Vapor:	212.4	lb/lbmol	TankESP speciation profile for HFM Coolant Surrogate

43.2.2 TCM Coolant Surrogate Properties

Physical/Chemical Property	Value		Basis
Density:	6.79	lb/gal	Density of Magiesol 47 (or equivalent) base rolling oil for water/oil emulsion coolant supplied to TCM
Molecular Weight - Liquid:	198.4	lb/lbmol	TankESP speciation profile for TCM Coolant Surrogate (tetradecane, C14H30, CAS No. 629-59-4)
Molecular Weight - Vapor:	198.4	lb/lbmol	TankESP speciation profile for TCM Coolant Surrogate

43.3 Hot and Cold Mill DAF Emission Factor Derivation for Flotation Air and Liquid Surface Evaporative Loss

> Losses to diffused air are quantified based on an assumption that the coolant surrogate reaches thermal and vapor liquid equilibrium with the diffused air.

> Equilibrium partial pressures are determined using Antoine's Equation. Coolant surrogates and corresponding molecular weights and Antoine's coefficients are listed below:

Coolant	Coolant Surrogate	Mol.Wt. (g/mol)	Antoine Coeffs[1] A	B	C
HFM	Pentadecane	212.42	7.30	1985.73	178.68
TCM	Tetradecane	198.39	7.26	1914.86	183.52

[1] From of Antoine's equation is P*(mmHg) = 10^(A-(B/(C+T(deg C)))

Universal gas constant (R)	8.21E-05	atm-m3/gmol-K

43.3.1 Hot Mill DAF VOC Emission Factor

Parameter	Value		Basis
Diffused Air Flow Rate	0.00063	m3/s	Based on vendor specifications
DAF Operating Temp.	55	deg. C	Based on vendor specifications
DAF Operating Pressure	1	atm	Based on vendor specifications
Air Inlet Temp	25	deg. C	Based on vendor specifications
Air Flow Rate Corrected to DAF Temp	6.93E-04	m3/s	= 0.00063 m3/s x 328 K / 298 K
Partial Pressure of VOC	8.34E-05	atm	Equilibrium partial pressure based on Antoine's Equation
Molar Concentration of VOC	3.10E-03	mol/m3	=8.34E-05 atm / 328 K / 8.21E-05 atm·m3/gmol·K
Concentration of VOC	0.66	g/m3	= 3.10E-03 mol/m3 x 212.42 g/mol
VOC Emission Rate in Diffused Air	3.62E-03	lb/hr	= 0.66 g/m3 x 6.93E-04 m3/s x 0.0022 lb/g x 3600 s/hr
VOC Annual Emission Rate in Diffused Air	0.016	tpy	= 3.62E-03 lb/hr x 8,760 hr/year / 2,000 lb/ton
VOC Annual Emission Rate from Evaporation	7.47E-05	tpy	TankESP

> Total annual VOC emissions are based on the sum of standing (evaporative) losses and losses into diffused air.

> The VOC emission factor uses the throughput of wastewater as the normalizing process variable.

Parameter	Value		Basis
Total Annual VOC Emission Rate	0.016	tpy	= 0.016 tpy + 7.47E-05 tpy
Maximum Hourly Process Rate	2.70	Mgal/hr	Based on vendor specifications
VOC Emission Factor	1.35E-03	lb/Mgal	= 0.016 tpy x 2,000 lb/ton / 8,760 hr/yr / 2.70 Mgal/hr

43.3.2 Cold Mill DAF

Parameter	Value		Basis
Diffused Air Flow Rate	0.00063	m3/s	Based on vendor specifications
DAF Operating Temp	20	deg. C	Avg Daily temp for Mobile, AL from AP-42 Table 7.1-7
DAF Operating Pressure	1	atm	Based on vendor specifications
Air Inlet temp	25	deg. C	Based on vendor specifications
Air Flow Rate Corrected to DAF Temp	6.18E-04	m3/s	= 0.00063 m3/s x 293 K / 298 K
Partial Pressure of VOC	8.92E-06	atm	Equilibrium partial pressure based on Antoine's Equation
Molar Concentration of VOC	3.71E-04	mol/m3	=8.92E-06 atm / 293 K / 1.35E-03 atm·m3/gmol·K
Concentration of VOC	0.07	g/m3	= 3.71E-04 mol/m3 x 198.39 g/mol
VOC Emission Rate in Diffused Air	3.62E-04	lb/hr	= 0.07 g/m3 x 6.18E-04 m3/s x 0.0022 lb/g x 3600 s/hr
VOC Annual Emission Rate in Diffused Air	0.0016	tpy	= 3.62E-04 lb/hr x 8,760 hr/year / 2,000 lb/ton
VOC Annual Emission Rate from Evaporation	2.71E-05		TankESP

> Total annual emissions are based on the sum of standing (evaporative) losses and losses into diffused air.
> The VOC emission factor uses the throughput of wastewater as the normalizing process variable.

Parameter	Value		Basis
Total Annual VOC Emission Rate	0.0016	tpy	= 0.0016 tpy + 2.71E-05 tpy
Maximum Hourly Process Rate	2.10	Mgal/hr	Based on vendor specifications
VOC Emission Factor	1.75E-04	lb/Mgal	= 0.0016 tpy x 2,000 lb/ton / 8,760 hr/yr / 2.10 Mgal/hr

43.4 Potential Emission Calculations for Wastewater Treatment Process

> Hourly and annual potential emissions from the WWTP Hot Mill and Cold Mill Oil Tanks are separately evaluated for breathing/standing and working losses based on the TankESP output.
> Hourly potential emissions for the DAF units are calculated using the emission factor and estimated hourly fluid wastewater throughput. Annual potential emissions are calculated using the emission factor and annual wastewater throughput.

43.4.1 Hot Mill Oil Storage Tanks (2) Potential Emissions

Pollutant	Evap. Loss Type	Emission Factor (lb/Mgal)	Emission Factor Basis		Maximum Hourly Process Rate Value	Units	Potential Emission Rate per Tank (lb/hr)	(tpy)	Total Potential Emission Rate (lb/hr)	(tpy)
VOC	Standing	0.16	lb/Mgal-cap	TankESP	1.14E-03	Mgal-cap/hr	1.85E-04	8.08E-04	3.69E-04	1.62E-03
	Working	0.011	lb/Mgal	TankESP	5.94E-02	Mgal/hr	6.60E-04	2.89E-03	1.32E-03	5.78E-03
	Total						8.45E-04	3.70E-03	1.69E-03	7.40E-03

43.4.2 Cold Mill Oil Storage Tank Potential Emissions

Pollutant	Evap. Loss Type	Emission Factor (lb/Mgal)	Emission Factor Basis		Maximum Hourly Process Rate Value	Maximum Hourly Process Rate Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
VOC	Standing	0.36	lb/Mgal-cap	TankESP	2.28E-03	Mgal-cap/hr	8.17E-04	3.58E-03
	Working	0.028	lb/Mgal	TankESP	1.04E-01	Mgal/hr	2.88E-03	1.26E-02
	Total						3.70E-03	1.62E-02

43.4.3 Hot Mill DAF Potential Evaporative Emissions

Pollutant	EmissionFactor (lb/Mgal)	Emission Factor Basis		Maximum Hourly Process Rate Value	Maximum Hourly Process Rate Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
VOC	1.35E-03	lb/Mgal	Ant. Eqn. + TankESP	2.70	Mgal/hr	3.64E-03	0.016

43.4.4 Cold Mill DAF Potential Evaporative Emissions

Pollutant	EmissionFactor (lb/Mgal)	Emission Factor Basis		Maximum Hourly Process Rate Value	Maximum Hourly Process Rate Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
VOC	1.75E-04	lb/Mgal	Ant. Eqn. + TankESP	2.10	Mgal/hr	3.68E-04	1.61E-03

APPENDIX D. ADEM APPLICATION FORMS

Novelis Corp. - Bay Minette Facility
Appendix D - ADEM Application Forms

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (AIR DIVISION)

Do not Write in This Space

Facility Number | | | | - | | | | |

CONSTRUCTION/OPERATING PERMIT APPLICATION
FACILITY IDENTIFICATION FORM

1. Name of Facility, Firm, or Institution: Novelis Corp. - Bay Minette Facility

Facility Physical Location Address

Street & Number: 15944 Aluminum Way

City: Bay Minette County: Baldwin Zip: 36507

Facility Mailing Address (If different from above)

Address or PO Box: 15944 Aluminum Way

City: Bay Minette State: AL Zip: 36507

Owner's Business Mailing Address

2. Owner: Novelis, Corp.

Street & Number: 3550 Peachtree Road, Suite 1100 City: Atlanta

State: GA Zip: 30326 Telephone: (404) 760-4000

Responsible Official's Business Mailing Address

3. Responsible Official: Tori Holt Title: Plant Manager

Street & Number: 15944 Aluminum Way

City: Bay Minette State: AL Zip: 36507

Telephone Number: (315) 297-0045 E-mail Address: tori.holt@novelis.adityabirla.com

Plant Contact Information

4. Plant Contact: Steve Royer Title: Senior EHS Manager

Telephone Number: (404) 263-1948 E-mail Address: Steve.Royer@novelis.adityabirla.com

5. Location Coordinates:

UTM	429.114 km	E-W	3,424.283 km	N-S
Latitude/Longitude	30.949875	LAT	-87.742128	LONG

6. Permit application is made for:

- ☐ Existing source (initial application)
- ☐ Existing source (permit renewal)
- ☑ Modification
- ☐ New source (to be constructed)
- ☐ Change of ownership
- ☐ Change of location
- ☐ Other (specify) _____

If application is being made to construct or modify, please provide the name and address of installer or contractor

N/A

Telephone

Date construction/modification to begin 2023 to be completed Q2 2026

7. Permit application is being made to obtain the following type permit:

- ☑ Air permit
- ☐ Major source operating permit
- ☐ Synthetic minor source operating permit
- ☐ General permit

8. Indicate the number of each of the following forms attached and made a part of this application: (if a form does not apply to your operation indicate "N/A" in the space opposite the form). Multiple forms may be used as required.

N/A	ADEM 104 - INDIRECT HEATING EQUIPMENT
40	ADEM 105 - MANUFACTURING OR PROCESSING OPERATION
N/A	ADEM 106 - REFUSE HANDLING, DISPOSAL, AND INCINERATION
12	ADEM 107 - STATIONARY INTERNAL COMBUSTION ENGINES
N/A	ADEM 108 - LOADING, STORAGE & DISPENSING LIQUID & GASEOUS ORGANIC COMPOUNDS
1	ADEM 109 - VOLATILE ORGANIC COMPOUND SURFACE COATING EMISSION SOURCES
21	ADEM 110 - AIR POLLUTION CONTROL DEVICE
N/A	ADEM 112 - SOLVENT METAL CLEANING
N/A	ADEM 438 - CONTINUOUS EMISSION MONITORS
N/A	ADEM 437 - COMPLIANCE SCHEDULE

9. General nature of business: (describe and list appropriate standard industrial classification (SIC) and North American Industry Classification System (NAICS) (www.naics.com) code(s)):

Refer to Sections 2.1 and 2.2 of PSD Application Volume 1

10. For those making application for a synthetic minor or major source operating permit, please summarize each pollutant emitted and the potential facility-wide annual emission rate for the pollutant. Indicate those pollutants for which the facility is major. Not a major source operating permit application, but data provided for reference.

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
PM	246.94	Yes
PM10	383.22	Yes
PM2.5	326.06	Yes
NOX	698.62	Yes
CO	605.54	Yes
VOC	664.73	Yes
SO2	2.63	No
Lead	0.01	No
Total HAP	261.41	Yes

*Potential emissions are either the maximum allowed by the regulations or by permit, or, if there is no regulatory limit, it is the emissions that occur from continuous operation at maximum capacity.

11. For those applying for a major source operating permit, indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: N/A - Not a Title V Major Source Operating Permit Application

(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

12. List all insignificant activities and the basis for listing them as such (i.e., less than the insignificant activity thresholds or on the list of insignificant activities). Attach any documentation needed, such as calculations. No unit subject to an NSPS, NESHAP or MACT standard can be listed as insignificant.

Insignificant Activity	Basis
Dross Press #2 (Flex Line) (MC-22) - Refer to Section 11 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Dross Press #1 (CBS Line) (MC-24) - Refer to Section 11 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC4 (Flex Line) (MC-26) - Refer to Section 12 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC3 (Flex Line) (MC-34) - Refer to Section 12 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC2 (CBS Line) (MC-27) - Refer to Section 12 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC1 (CBS Line) (MC-28) - Refer to Section 12 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Molten Metal Utility Heaters (MC-35) - Refer to Section 13 of Appendix C to PSD App. As-Built for Emissions Basis	Trivial and Insignificant Activities Section 1: A1
DC1-DC4 Casting Unit- Lubricant Usage (MC-31) - Refer to Section 12 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Melting & Casting Ingot Saw (MC-32) - Refer to Section 14 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Caster Cooling Tower #1 (AS-04) - Refer to Section 27 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Hot Mill Cooling Tower (AS-05) - Refer to Section 27 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Hot Baghouses Lime Silos (5) (AS-20) - Refer to Section 31 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Cold Baghouse Dry Sorbent Silos (2) (AS-33) - Refer to Section 31 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Diesel Fuel Storage and Refueling Stations (4) (AS-21) - Refer to Section 32 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Hot Rolling Area Storage Tanks (14) (AS-22) - Refer to Section 33 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Cold Rolling Area Storage Tanks (13) (AS-23) - Refer to Section 33 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Coil Finishing Area Storage Tanks (22) (AS-24) - Refer to Section 33 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Cold Mill Cooling Tower (AS-26) - Refer to Section 27 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Finishing Cooling Tower (AS-27) - Refer to Section 27 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Round Tops/Pushers Cooling Tower (AS-28) - Refer to Section 27 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Anodizing Test Unit (AS-34) - Refer to Section 35 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Filtering Aid Material Handling (AS-35) - Refer to Section 36 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Cold Mill Coil Marking Machine (AS-36) - Refer to Section 37 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Mill Roll Grinding Machines (3) (AS-37) - Refer to Section 38 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Coil Finishing Roll Grinding Machine (AS-38) - Refer to Section 39 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Bearings Washing Machine (AS-39) - Refer to Section 40 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Hot Mill Parts Washing Bay (AS-40) - Refer to Section 41 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
Roll Shop Parts Washers (4) (AS-41) and Maintenance Parts Washers (7) (AS-42) - Refer to Section 42 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.
WWTP- Hot Mill Oil Tanks (2) (AS-43a), WWTP- Cold Mill Oil Tank (AS-43b), andWWTP- Hot Mill DAF (AS-43c) - Refer to Section 43 of Appendix C to PSD App. As-Built for Emissions Basis	<IA Thresh.

13. List and explain any exemptions from applicable requirements the facility is claiming:

a.	Refer to Section 4 Applicable Requirements Summary in PSD App. Volume 1
b.	Refer to Section 8.4 and 10.4 Applicable Requirements Summary for New Emissions Units
c.	
d.	
e.	
f.	
g.	
h.	
i.	

14. List below other attachments that are a part of this application(all supporting engineering calculations must be appended):

a.	Refer to Table of Contents to PSD App. Volume 1 and 2
b.	Refer to Table of Contents to PSD App. As-Built Reconciliation
c.	
d.	
e.	
f.	
g.	
h.	
i.	

I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION CONTAINED IN THIS APPLICATION ARE TRUE, ACCURATE AND COMPLETE.

I ALSO CERTIFY THAT THE SOURCE WILL CONTINUE TO COMPLY WITH APPLICABLE REQUIREMENTS FOR WHICH IT IS IN COMPLIANCE, AND THAT THE SOURCE WILL, IN A TIMELY MANNER, MEET ALL APPLICABLE REQUIREMENTS THAT WILL BECOME EFFECTIVE DURING THE PERMIT TERM AND SUBMIT A DETAILED SCHEDULE, IF NEEDED FOR MEETING THE REQUIREMENTS.

SIGNATURE OF RESPONSIBLE OFFICIAL	TITLE	DATE
	Plant Manager	11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 105 Forms - Scrap Processing Area

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (SCRAP PROCESSING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Aluminum Scrap Procesing Line #1

Make: WENDT or Equivalent **Model:** N/A

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2022 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Scrap		66,138	289,684

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Shredded Aluminum Scrap	289,684	tons/yr

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
SPL1	428.94	3,424.02			120	Refer to BPIP Output	270	10.417	N/A	64.5	330,000	80

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
SP-01	PM	**5.66**	**24.78**	Grain Loading Design Basis	**5.66**	BACT
SP-01	PM10	**2.89**	**12.64**	EPA PM Calculator	**2.89**	BACT
SP-01	PM2.5	**0.85**	**3.72**	EPA PM Calculator	**0.85**	BACT
SP-01	NOX	--	--	--	--	--
SP-01	CO	--	--	--	--	--
SP-01	VOC	--	--	--	--	--
SP-01	SO2	--	--	--	--	--
SP-01	CO2e	--	--	--	--	--
SP-01	Pb	--	--	--	--	--
SP-01	THAP	**0.09**	**0.39**	Sum of (Mn, Cr, Ni)	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (SCRAP PROCESSING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Aluminum Scrap Processing Line #2

Make: WENDT or Equivalent **Model:** N/A

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2022 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Scrap		66,138	289,684

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Shredded Aluminum Scrap	289,684	tons/yr

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
SPL2	428.94	3,423.99			120	Refer to BPIP Output	270	10.42	N/A	60.6	310,040	80

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
SP-02	PM	5.31	23.28	Grain Loading Design Basis	5.31	BACT
SP-02	PM10	2.71	11.87	EPA PM Calculator	2.71	BACT
SP-02	PM2.5	0.80	3.49	EPA PM Calculator	0.80	BACT
SP-02	NOX	--	--	--	--	--
SP-02	CO	--	--	--	--	--
SP-02	VOC	--	--	--	--	--
SP-02	SO2	--	--	--	--	--
SP-02	CO2e	--	--	--	--	--
SP-02	Pb	--	--	--	--	--
SP-02	THAP	0.08	0.36	Sum of (Mn, Cr, Ni)	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (SCRAP PROCESSING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Aluminum Scrap Processing Line #3

Make: WENDT or Equivalent **Model:** N/A

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Scrap		66,138	289,684

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Shredded Aluminum Scrap	289,684	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
SPL3	428.96	3,424.04			120	Refer to BPIP Output	270	6.33	N/A	63.9	120,800	80

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11/13/2025

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
SP-03	PM	2.07	9.07	Grain Loading Design Basis	2.07	BACT
SP-03	PM10	1.06	4.63	EPA PM Calculator	1.06	BACT
SP-03	PM2.5	0.31	1.36	EPA PM Calculator	0.31	BACT
SP-03	NOX	--	--	--	--	--
SP-03	CO	--	--	--	--	--
SP-03	VOC	--	--	--	--	--
SP-03	SO2	--	--	--	--	--
SP-03	CO2e	--	--	--	--	--
SP-03	Pb	--	--	--	--	--
SP-03	THAP	0.03	0.14	Sum of (Mn, Cr, Ni)	N/A	N/A

12. Using a flow diagram:
See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (SCRAP PROCESSING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Aluminum Scrap Sorting Line #1

Make: WENDT or Equivalent **Model:** N/A

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Scrap		66,138	289,684

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Shredded Aluminum Scrap	289,684	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
SRT1	428.96	3,424.07			120	Refer to BPIP Output	270	6.33	N/A	58.2	110,000	80

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
SP-05	PM	1.89	8.26	Grain Loading Design Basis	1.89	BACT
SP-05	PM10	0.96	4.21	EPA PM Calculator	0.96	BACT
SP-05	PM2.5	0.28	1.24	EPA PM Calculator	0.28	BACT
SP-05	NOX	--	--	--	--	--
SP-05	CO	--	--	--	--	--
SP-05	VOC	--	--	--	--	--
SP-05	SO2	--	--	--	--	--
SP-05	CO2e	--	--	--	--	--
SP-05	Pb	--	--	--	--	--
SP-05	THAP	0.03	0.13	Sum of (Mn, Cr, Ni)	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 105 Forms - Melting & Casting Area

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Rotary Decoater #3

Make: Gillespie & Powers and Hauck **Model:** Custom and TRIOX14SW-1IFSC00D

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Shredded Aluminum Scrap		55,116	241,406

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 30.2 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Decoated Aluminum	241,406	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
DSWHBH	428.90	3424.18			120	Refer to BPIP Output	265	17.00	N/A	62.0	843,700	216.6

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-01	PM	1.62	7.08	Grain Loading Design Basis	1.62	BACT
MC-01	PM10	5.36	23.46	EPA PM Calculator + UPL	5.36	BACT
MC-01	PM2.5	5.19	22.75	EPA PM Calculator + UPL	5.19	BACT
MC-01	NOX	8.82	38.62	BACT limit (incl. NG contri.)	8.82	BACT
MC-01	CO	7.78	34.06	UPL of Similar Source Test Data and Vendor estimate	7.78	BACT
MC-01	VOC	4.58	20.05	UPL of Similar Source Test Data and AP-42 Table 1.4-2	4.58	BACT
MC-01	SO2	0.02	0.08	AP-42 Table 1.4-2	120.8	4.0 lb/MMBtu
MC-01	CO2e	11,938	52,290	Engineering Estimate and 40 CFR 98 Subpart C	52,290 tpy	BACT
MC-01	Pb	6.89E-04	3.02E-03	RTR Modeling SMACT Docket and AP-42 Table 1.4-4	N/A	N/A
MC-01	THAP	10.32	45.19	Sum(HCl, D/F, Metal HAP, Org. HAP) and AP-42 Tables 1.4-3 & 1.4-4	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

☑ **Check box if extra pages are attached)**
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Rotary Decoater #2

Make: Gillespie & Powers and Hauck **Model:** Custom and TRIOX14SW-1IFSC00D

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Shredded Aluminum Scrap		55,116	241,406

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 30.2 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Decoated Aluminum	241,406	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
DSWHBH	428.90	3,424.18			120	Refer to BPIP Output	265	17.00	N/A	62.0	843,700	216.6

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-02	PM	**0.96**	**4.23**	Grain Loading Design Basis	**0.96**	BACT
MC-02	PM10	**4.76**	**20.83**	EPA PM Calculator + UPL	**4.76**	BACT
MC-02	PM2.5	**4.66**	**20.41**	EPA PM Calculator + UPL	**4.66**	BACT
MC-02	NOX	**8.82**	**38.62**	BACT limit (incl. NG contri.)	**8.82**	BACT
MC-02	CO	**7.78**	**34.06**	UPL of Similar Source Test Data and Vendor estimate	**7.78**	BACT
MC-02	VOC	**4.58**	**20.05**	UPL of Similar Source Test Data and AP-42 Table 1.4-2	**4.58**	BACT
MC-02	SO2	0.02	0.08	AP-42 Table 1.4-2	**120.8**	4.0 lb/MMBtu
MC-02	CO2e	**11,938**	**52,290**	Engineering Estimate and 40 CFR 98 Subpart C	**52,290 tpy**	BACT
MC-02	Pb	**4.17E-04**	**1.83E-03**	RTR Modeling SMACT Docket and AP-42 Table 1.4-4	N/A	N/A
MC-02	THAP	**10.32**	**45.19**	Sum(HCl, D/F, Metal HAP, Org. HAP) and AP-42 Tables 1.4-3 & 1.4-4	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

☑ **Check box if extra pages are attached)**
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Rotary Decoater #1

Make: Gillespie & Powers and Hauck **Model:** Custom and TRIOX14SW-1IFSC00D

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Shredded Aluminum Scrap		55,116	241,406

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 30.2 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Decoated Aluminum	241,406	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
DSWHBH	428.90	3,424.18			120	Refer to BPIP Output	265	17.00	N/A	62.0	843,700	216.6

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-03	PM	**1.69**	**7.40**	Grain Loading Design Basis	**1.69**	BACT
MC-03	PM10	**5.42**	**23.75**	EPA PM Calculator + UPL	**5.42**	BACT
MC-03	PM2.5	**5.25**	**23.01**	EPA PM Calculator + UPL	**5.25**	BACT
MC-03	NOX	**8.82**	**38.62**	BACT limit (incl. NG contri.)	**8.82**	BACT
MC-03	CO	**7.78**	**34.06**	UPL of Similar Source Test Data and Vendor estimate	**7.78**	BACT
MC-03	VOC	**4.58**	**20.05**	UPL of Similar Source Test Data and AP-42 Table 1.4-2	**4.58**	BACT
MC-03	SO2	0.02	0.08	AP-42 Table 1.4-2	**120.8**	4.0 lb/MMBtu
MC-03	CO2e	**11,938**	**52,290**	Engineering Estimate and 40 CFR 98 Subpart C	**52,290 tpy**	BACT
MC-03	Pb	**7.19E-04**	**3.15E-03**	RTR Modeling SMACT Docket and AP-42 Table 1.4-4	N/A	N/A
MC-03	THAP	**10.32**	**45.19**	Sum(HCl, D/F, Metal HAP, Org. HAP) and AP-42 Tables 1.4-3 & 1.4-4	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

☑ **Check box if extra pages are attached)**
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Sidewell Melting Furnace #5

Make: Gillespie & Powers **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Feed/Charge Materials		48,502	212,437

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 38.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	212,437	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
DSWHBH	428.90	3,424.18			120	Refer to BPIP Output	265	17.00	N/A	62.0	843,700	216.6

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-04	PM	**1.18**	**5.18**	Grain Loading Design Basis	**1.18**	BACT
MC-04	PM10	**3.89**	**17.05**	TRC Report + UPL	**3.89**	BACT
MC-04	PM2.5	3.47	**15.20**	TRC Report + UPL	**3.47**	BACT
MC-04	NOX	**8.46**	**37.04**	UPL of Similar Source Test Data and Vendor estimate	**8.46**	BACT
MC-04	CO	**8.15**	**35.72**	UPL of Similar Source Test Data and Vendor estimate	**8.15**	BACT
MC-04	VOC	5.44	23.82	UPL of Similar Source Test Data and AP-42 Table 1.4-2	5.44	BACT
MC-04	SO2	0.02	0.10	AP-42 Table 1.4-2	152.0	4.0 lb/MMBtu
MC-04	CO2e	4,450	19,490	40 CFR 98 Subpart C	19,490 tpy	BACT
MC-04	Pb	**5.77E-05**	**2.53E-04**	RTR Modeling SMACT Docket and AP-42 Table 1.4-4	N/A	N/A
MC-04	THAP	0.66	2.90	Sum(HCl, HF, D/F, Metal HAP) and AP-42 Tables 1.4-3 & 1.4-4	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Sidewell Melting Furnace #2

Make: Gillespie & Powers **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Feed/Charge Materials		48,502	212,437

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 38.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	212,437	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
DSWHBH	428.90	3,424.18			120	Refer to BPIP Output	265	17.00	N/A	62.0	843,700	216.6

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-05	PM	**1.18**	**5.18**	Grain Loading Design Basis	**1.18**	BACT
MC-05	PM10	**3.89**	**17.05**	TRC Report + UPL	**3.89**	BACT
MC-05	PM2.5	3.47	**15.20**	TRC Report + UPL	**3.47**	BACT
MC-05	NOX	**8.46**	**37.04**	UPL of Similar Source Test Data and Vendor estimate	**8.46**	BACT
MC-05	CO	**8.15**	**35.72**	UPL of Similar Source Test Data and Vendor estimate	**8.15**	BACT
MC-05	VOC	5.44	23.82	UPL of Similar Source Test Data and AP-42 Table 1.4-2	5.44	BACT
MC-05	SO2	0.02	0.10	AP-42 Table 1.4-2	152.0	4.0 lb/MMBtu
MC-05	CO2e	4,450	19,490	40 CFR 98 Subpart C	19,490 tpy	BACT
MC-05	Pb	**5.77E-05**	**2.53E-04**	RTR Modeling SMACT Docket and AP-42 Table 1.4-4	N/A	N/A
MC-05	THAP	0.66	2.90	Sum(HCl, HF, D/F, Metal HAP) and AP-42 Tables 1.4-3 & 1.4-4	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Sidewell Melting Furnace #2

Make: Gillespie & Powers **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Feed/Charge Materials		48,502	212,437

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 38.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	212,437	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
DSWHBH	428.90	3,424.18			120	Refer to BPIP Output	265	17.00	N/A	62.0	843,700	216.6

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-06	PM	**1.18**	**5.18**	Grain Loading Design Basis	**1.18**	BACT
MC-06	PM10	**3.89**	**17.05**	TRC Report + UPL	**3.89**	BACT
MC-06	PM2.5	3.47	**15.20**	TRC Report + UPL	**3.47**	BACT
MC-06	NOX	**8.46**	**37.04**	UPL of Similar Source Test Data and Vendor estimate	**8.46**	BACT
MC-06	CO	**8.15**	**35.72**	UPL of Similar Source Test Data and Vendor estimate	**8.15**	BACT
MC-06	VOC	5.44	23.82	UPL of Similar Source Test Data and AP-42 Table 1.4-2	5.44	BACT
MC-06	SO2	0.02	0.10	AP-42 Table 1.4-2	152.0	4.0 lb/MMBtu
MC-06	CO2e	4,450	19,490	40 CFR 98 Subpart C	19,490 tpy	BACT
MC-06	Pb	**5.77E-05**	**2.53E-04**	RTR Modeling SMACT Docket and AP-42 Table 1.4-4	N/A	N/A
MC-06	THAP	0.66	2.90	Sum(HCl, HF, D/F, Metal HAP) and AP-42 Tables 1.4-3 & 1.4-4	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Sidewell Melting Furnace #1

Make: Gillespie & Powers **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Feed/Charge Materials		48,502	212,437

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 38.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	212,437	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
DSWHBH	428.90	3,424.18			120	Refer to BPIP Output	265	17.00	N/A	62.0	843,700	216.6

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-07	PM	**1.18**	**5.18**	Grain Loading Design Basis	**1.18**	BACT
MC-07	PM10	**3.89**	**17.05**	TRC Report + UPL	**3.89**	BACT
MC-07	PM2.5	3.47	**15.20**	TRC Report + UPL	**3.47**	BACT
MC-07	NOX	**8.46**	**37.04**	UPL of Similar Source Test Data and Vendor estimate	**8.46**	BACT
MC-07	CO	**8.15**	**35.72**	UPL of Similar Source Test Data and Vendor estimate	**8.15**	BACT
MC-07	VOC	5.44	23.82	UPL of Similar Source Test Data and AP-42 Table 1.4-2	5.44	BACT
MC-07	SO2	0.02	0.10	AP-42 Table 1.4-2	152.0	4.0 lb/MMBtu
MC-07	CO2e	4,450	19,490	40 CFR 98 Subpart C	19,490 tpy	BACT
MC-07	Pb	**5.77E-05**	**2.53E-04**	RTR Modeling SMACT Docket and AP-42 Table 1.4-4	N/A	N/A
MC-07	THAP	0.66	2.90	Sum(HCl, HF, D/F, Metal HAP) and AP-42 Tables 1.4-3 & 1.4-4	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Sidewell Melting Furnace #3

Make: Gillespie & Powers **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Feed/Charge Materials		48,502	212,437

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 38.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	212,437	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-08	PM	**1.11**	**4.85**	Grain Loading Design Basis	**1.11**	BACT
MC-08	PM10	**3.84**	**16.81**	TRC Report + UPL	**3.84**	BACT
MC-08	PM2.5	**3.44**	**15.09**	TRC Report + UPL	**3.44**	BACT
MC-08	NOX	**8.46**	**37.04**	UPL of Similar Source Test Data and Vendor estimate	**8.46**	BACT
MC-08	CO	**8.15**	**35.72**	UPL of Similar Source Test Data and Vendor estimate	**8.15**	BACT
MC-08	VOC	5.44	23.82	UPL of Similar Source Test Data and AP-42 Table 1.4-2	5.44	BACT
MC-08	SO2	0.02	0.10	AP-42 Table 1.4-2	152.0	4.0 lb/MMBtu
MC-08	CO2e	4,450	19,490	40 CFR 98 Subpart C	19,490 tpy	BACT
MC-08	Pb	**5.52E-05**	**2.42E-04**	RTR Modeling SMACT Docket and AP-42 Table 1.4-4	N/A	N/A
MC-08	THAP	0.66	2.90	Sum(HCl, HF, D/F, Metal HAP) and AP-42 Tables 1.4-3 & 1.4-4	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

☑ **Check box if extra pages are attached)**
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook

Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-				

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Novelis Dual Chamber (NDC) Recycle Furnaces

Make: Mechatherm **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Feed/Charge Materials		55,116	241,406

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 59.3 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	241,406	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-09	PM	**2.10**	**9.18**	Grain Loading Design Basis	**2.10**	BACT
MC-09	PM10	**4.96**	**21.71**	TRC Report + UPL	**4.96**	BACT
MC-09	PM2.5	**4.21**	**18.45**	TRC Report + UPL	**4.21**	BACT
MC-09	NOX	**13.99**	**61.29**	UPL of Similar Source Test Data and Vendor estimate	**13.99**	BACT
MC-09	CO	**10.43**	**45.70**	UPL of Similar Source Test Data and Vendor estimate	**10.43**	BACT
MC-09	VOC	**6.27**	**27.46**	UPL of Similar Source Test Data and AP-42 Table 1.4-2	**6.27**	BACT
MC-09	SO2	0.04	**0.16**	AP-42 Table 1.4-2	**237.2**	4.0 lb/MMBtu
MC-09	CO2e	**15,346**	**67,215**	Engineering Estimate and 40 CFR 98 Subpart C	**67,215 tpy**	BACT
MC-09	Pb	**9.82E-05**	**4.30E-04**	RTR Modeling SMACT Docket and AP-42 Table 1.4-4.	N/A	N/A
MC-09	THAP	**2.50**	**10.94**	Sum(HCl, HF, D/F, Metal HAP, Org. HAP) and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-				

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Round Top Furnace #2

Make: Gautschi Engineering **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Feed/Charge Materials		92,594	405,562

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 112.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	405,562	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-10	PM	1.11	4.85	Grain Loading Design Basis	1.11	BACT
MC-10	PM10	3.60	15.78	TRC Report + UPL	3.60	BACT
MC-10	PM2.5	3.53	15.46	TRC Report + UPL	3.53	BACT
MC-10	NOX	13.83	60.56	Min. of Similar Group 1 Units and Vendor estimate	13.83	BACT
MC-10	CO	9.18	40.22	Min. of Similar Group 1 Units and Vendor estimate	9.18	BACT
MC-10	VOC	3.29	14.43	Min. of Similar Group 1 Units and AP-42 Table 1.4-2	3.29	BACT
MC-10	SO2	0.07	0.29	AP-42 Table 1.4-2	448.0	4.0 lb/MMBtu
MC-10	CO2e	13,115	57,443	40 CFR 98 Subpart C	57,443 tpy	BACT
MC-10	Pb	5.60E-05	2.45E-04	AP-42 Tables 1.4-4.	N/A	N/A
MC-10	THAP	1.03	4.51	Sum(HCl, D/F) and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-				

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Round Top Furnace #1

Make: Gautschi Engineering **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Feed/Charge Materials		92,594	405,562

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 112.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	405,562	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-11	PM	1.11	4.85	Grain Loading Design Basis	1.11	BACT
MC-11	PM10	3.60	15.78	TRC Report + UPL	3.60	BACT
MC-11	PM2.5	3.53	15.46	TRC Report + UPL	3.53	BACT
MC-11	NOX	13.83	60.56	Min. of Similar Group 1 Units and Vendor estimate	13.83	BACT
MC-11	CO	9.18	40.22	Min. of Similar Group 1 Units and Vendor estimate	9.18	BACT
MC-11	VOC	3.29	14.43	Min. of Similar Group 1 Units and AP-42 Table 1.4-2	3.29	BACT
MC-11	SO2	0.07	0.29	AP-42 Table 1.4-2	448.0	4.0 lb/MMBtu
MC-11	CO2e	13,115	57,443	40 CFR 98 Subpart C	57,443 tpy	BACT
MC-11	Pb	5.60E-05	2.45E-04	AP-42 Tables 1.4-4.	N/A	N/A
MC-11	THAP	1.03	4.51	Sum(HCl, D/F) and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-				

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Holding Furnace #4

Make: Gautschi **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Molten Aluminum		122,356	535,921

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 27.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	535,921	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-12	PM	0.75	3.28	Grain Loading Design Basis	0.75	BACT
MC-12	PM10	1.46	6.39	TRC Report + UPL	1.46	BACT
MC-12	PM2.5	1.41	6.17	TRC Report + UPL	1.41	BACT
MC-12	NOX	2.05	8.99	Vendor estimate	2.05	BACT
MC-12	CO	2.27	9.93	AP-42 Table 1.4-1	2.27	BACT
MC-12	VOC	1.90	8.31	BACT limit (incl. NG contri.)	1.90	BACT
MC-12	SO2	0.02	0.07	AP-42 Table 1.4-2	108.0	4.0 lb/MMBtu
MC-12	CO2e	3,162	13,848	40 CFR 98 Subpart C	13,848 tpy	BACT
MC-12	Pb	3.80E-05	1.66E-04	RTR Modeling SMACT Docket and AP-42 Tables 1.4-4.	N/A	N/A
MC-12	THAP	1.92	8.39	Sum of (HCl, HF, Metal HAP) and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Holding Furnace #3

Make: Gautschi **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Molten Aluminum		122,356	535,921

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 27.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	535,921	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-13	PM	**0.79**	**3.46**	Grain Loading Design Basis	**0.79**	BACT
MC-13	PM10	**1.49**	**6.55**	TRC Report + UPL	**1.49**	BACT
MC-13	PM2.5	**1.44**	**6.32**	TRC Report + UPL	**1.44**	BACT
MC-13	NOX	**2.05**	**8.99**	Vendor estimate	**2.05**	BACT
MC-13	CO	**2.27**	**9.93**	AP-42 Table 1.4-1	**2.27**	BACT
MC-13	VOC	**1.90**	**8.31**	BACT limit (incl. NG contri.)	**1.90**	BACT
MC-13	SO2	0.02	**0.07**	AP-42 Table 1.4-2	**108.0**	4.0 lb/MMBtu
MC-13	CO2e	**3,162**	**13,848**	40 CFR 98 Subpart C	**13,848 tpy**	BACT
MC-13	Pb	**3.93E-05**	**1.72E-04**	RTR Modeling SMACT Docket and AP-42 Tables 1.4-4.	N/A	N/A
MC-13	THAP	**1.92**	**8.39**	Sum of (HCl, HF, Metal HAP) and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Holding Furnace #2

Make: Gautschi **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Molten Aluminum		119,049	521,437

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 27.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	521,437	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-14	PM	**0.74**	**3.25**	Grain Loading Design Basis	**0.74**	BACT
MC-14	PM10	**1.43**	**6.27**	TRC Report + UPL	**1.43**	BACT
MC-14	PM2.5	**1.38**	**6.05**	TRC Report + UPL	**1.38**	BACT
MC-14	NOX	**2.05**	**8.99**	Vendor estimate	**2.05**	BACT
MC-14	CO	**2.27**	**9.93**	AP-42 Table 1.4-1	**2.27**	BACT
MC-14	VOC	**1.85**	**8.08**	BACT limit (incl. NG contri.)	**1.85**	BACT
MC-14	SO2	0.02	**0.07**	AP-42 Table 1.4-2	**108.0**	4.0 lb/MMBtu
MC-14	CO2e	**3,162**	**13,848**	40 CFR 98 Subpart C	**13,848 tpy**	BACT
MC-14	Pb	**3.78E-05**	**1.65E-04**	RTR Modeling SMACT Docket and AP-42 Tables 1.4-4.	N/A	N/A
MC-14	THAP	**1.87**	**8.17**	Sum of (HCl, HF, Metal HAP) and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Holding Furnace #1

Make: Gautschi **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Molten Aluminum		119,049	521,437

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 27.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Molten Aluminum	521,437	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-15	PM	**0.75**	**3.28**	Grain Loading Design Basis	**0.75**	BACT
MC-15	PM10	**1.44**	**6.30**	TRC Report + UPL	**1.44**	BACT
MC-15	PM2.5	**1.39**	**6.08**	TRC Report + UPL	**1.39**	BACT
MC-15	NOX	**2.05**	**8.99**	Vendor estimate	**2.05**	BACT
MC-15	CO	**2.27**	**9.93**	AP-42 Table 1.4-1	**2.27**	BACT
MC-15	VOC	**1.85**	**8.08**	BACT limit (incl. NG contri.)	**1.85**	BACT
MC-15	SO2	0.02	**0.07**	AP-42 Table 1.4-2	**108.0**	4.0 lb/MMBtu
MC-15	CO2e	**3,162**	**13,848**	40 CFR 98 Subpart C	**13,848 tpy**	BACT
MC-15	Pb	**3.80E-05**	**1.66E-04**	RTR Modeling SMACT Docket and AP-42 Tables 1.4-4.	N/A	N/A
MC-15	THAP	**1.87**	**8.17**	Sum of (HCl, HF, Metal HAP) and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-				

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** In-Line Degasser #4

Make: Pyrotek, STAS, or Equivalent **Model:**

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Molten Aluminum		218,257	535,921

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Degassed Molten Aluminum	535,921	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-16	PM	**1.09**	**2.68**	SMACT Limit	**1.09**	BACT
MC-16	PM10	**0.58**	**1.43**	EPA PM Calculator	**0.58**	BACT
MC-16	PM2.5	**0.22**	**0.53**	EPA PM Calculator	**0.22**	BACT
MC-16	NOX	--	--	--	--	--
MC-16	CO	--	--	--	--	--
MC-16	VOC	--	--	--	--	--
MC-16	SO2	--	--	--	--	--
MC-16	CO2e	--	--	--	--	--
MC-16	Pb	--	--	--	--	--
MC-16	THAP	**4.37**	**10.72**	HC Only HAP- SMACT Limit	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** In-Line Degasser #3

Make: Pyrotek, STAS, or Equivalent **Model:**

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Molten Aluminum		218,257	535,921

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Degassed Molten Aluminum	535,921	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-33	PM	1.09	2.68	SMACT Limit	1.09	BACT
MC-33	PM10	0.58	1.43	EPA PM Calculator	0.58	BACT
MC-33	PM2.5	0.22	0.53	EPA PM Calculator	0.22	BACT
MC-33	NOX	--	--	--	--	--
MC-33	CO	--	--	--	--	--
MC-33	VOC	--	--	--	--	--
MC-33	SO2	--	--	--	--	--
MC-33	CO2e	--	--	--	--	--
MC-33	Pb	--	--	--	--	--
MC-33	THAP	4.37	10.72	HC Only HAP- SMACT Limit	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** In-Line Degasser #2

Make: Pyrotek, STAS, or Equivalent **Model:**

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Molten Aluminum		218,257	521,437

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Degassed Molten Aluminum	521,437	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-17	PM	1.09	2.61	SMACT Limit	1.09	BACT
MC-17	PM10	0.58	1.39	EPA PM Calculator	0.58	BACT
MC-17	PM2.5	0.22	0.52	EPA PM Calculator	0.22	BACT
MC-17	NOX	--	--	--	--	--
MC-17	CO	--	--	--	--	--
MC-17	VOC	--	--	--	--	--
MC-17	SO2	--	--	--	--	--
MC-17	CO2e	--	--	--	--	--
MC-17	Pb	--	--	--	--	--
MC-17	THAP	4.37	10.43	HC Only HAP- SMACT Limit	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** In-Line Degasser #1

Make: Pyrotek, STAS, or Equivalent **Model:**

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Molten Aluminum		218,257	521,437

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Degassed Molten Aluminum	521,437	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MHHBH	428.98	3,424.30			180	Refer to BPIP Output	265	14.8	N/A	62.3	645,700	201.75

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-18	PM	**1.09**	**2.61**	SMACT Limit	**1.09**	BACT
MC-18	PM10	**0.58**	**1.39**	EPA PM Calculator	**0.58**	BACT
MC-18	PM2.5	**0.22**	**0.52**	EPA PM Calculator	**0.22**	BACT
MC-18	NOX	--	--	--	--	--
MC-18	CO	--	--	--	--	--
MC-18	VOC	--	--	--	--	--
MC-18	SO2	--	--	--	--	--
MC-18	CO2e	--	--	--	--	--
MC-18	Pb	--	--	--	--	--
MC-18	THAP	**4.37**	**10.43**	HC Only HAP- SMACT Limit	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Sow Dryer #2

Make: Gautschi **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Prime Aluminum & RSI		52,020	227,848

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 30 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Preheated Prime Aluminum & RSI	227,848	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☐ Yes ☑ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
SWDRY1	429.13	3,424.11			72.0	Refer to BPIP Output	270	4.00	N/A	18.1	13,683	800

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-19	PM	**0.06**	0.17	AP-42 Table 1.4-2	**0.06**	BACT
MC-19	PM10	**0.10**	0.30	AP-42 Table 1.4-2 + EPA Speciate Database	**0.10**	BACT
MC-19	PM2.5	**0.10**	0.30	AP-42 Table 1.4-2 + EPA Speciate Database	**0.10**	BACT
MC-19	NOX	**3.28**	9.57	Vendor estimate	**3.28**	BACT
MC-19	CO	**2.19**	6.39	Vendor estimate	**2.19**	BACT
MC-19	VOC	**0.17**	0.48	AP-42 Table 1.4-2	**0.17**	BACT
MC-19	SO2	**0.02**	0.053	AP-42 Table 1.4-2	**120.0**	4.0 lb/MMBtu
MC-19	CO2e	**3,513**	10,258	40 CFR 98 Subpart C	10,258 tpy	BACT
MC-19	Pb	**1.50E-05**	4.38E-05	AP-42 Table 1.4-4.	N/A	N/A
MC-19	THAP	**0.06**	0.17	AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Sow Dryer #1

Make: Gautschi **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Prime Aluminum & RSI		52,020	227,848

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 30.0 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Preheated Prime Aluminum & RSI	227,848	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☐ Yes ☑ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
SWDRY2	429.09	3424.11			72.0	Refer to BPIP Output	270	4.00	N/A	18.1	13,683	800

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-20	PM	**0.06**	0.17	AP-42 Table 1.4-2	**0.06**	BACT
MC-20	PM10	**0.10**	0.30	AP-42 Table 1.4-2 + EPA Speciate Database	**0.10**	BACT
MC-20	PM2.5	**0.10**	0.30	AP-42 Table 1.4-2 + EPA Speciate Database	**0.10**	BACT
MC-20	NOX	**3.28**	9.57	Vendor estimate	**3.28**	BACT
MC-20	CO	**2.19**	6.39	Vendor estimate	**2.19**	BACT
MC-20	VOC	**0.17**	0.48	AP-42 Table 1.4-2	**0.17**	BACT
MC-20	SO2	**0.02**	0.053	AP-42 Table 1.4-2	**120.0**	4.0 lb/MMBtu
MC-20	CO2e	**3,513**	10,258	40 CFR 98 Subpart C	10,258 tpy	BACT
MC-20	Pb	**1.50E-05**	4.38E-05	AP-42 Table 1.4-4.	N/A	N/A
MC-20	THAP	**0.06**	0.17	AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Dross House

Make: Various/Custom **Model:**

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Hot Aluminum Dross		21,733	95,191

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Cooled Aluminum Dross	95,191	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
DSWHBH	428.90	3,424.18			120	Refer to BPIP Output	265	17.00	N/A	62.0	843,700	216.6

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-21	PM	1.54	6.77	Grain Loading Design Basis	1.54	BACT
MC-21	PM10	1.45	6.36	EPA PM Calculator	1.45	BACT
MC-21	PM2.5	1.20	5.28	EPA PM Calculator	1.20	BACT
MC-21	NOX	--	--	--	--	--
MC-21	CO	--	--	--	--	--
MC-21	VOC	--	--	--	--	--
MC-21	SO2	--	--	--	--	--
MC-21	CO2e	--	--	--	--	--
MC-21	Pb	--	--	--	--	--
MC-21	THAP	--	--	--	--	--

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (MELTING & CASTING AREA)

				-					-				

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Melting & Casting Building Fugitives- Including Dross Press #2 (Flex Line) (MC-22), Dross Press #1 (CBS Line) (MC-24), Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC4 (Flex Line) (MC-26)Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC3 (Flex Line) (MC-34), Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC2 (CBS Line) (MC-27), Ceramic Foam Filter (CFF) & Deep Bed Filter (DBF) System for DC1 (CBS Line) (MC-28), Molten Metal Utility Heaters (MC-35), DC1-DC4 Casting Unit-Lubricant Usage (MC-31), Melting & Casting Ingot Saw (MC-32)

Make: Various/Custom **Model:** Various/Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. **Materials (feed input) used in unit or process (include solid fuel materials used, if any):**

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Melting & Casting Ingot Saw (MC-32) - Reject Ingots for Melting		148,812	63,552
DC1-DC4 Casting Unit- Lubricant Usage (MC-31) - Casting Lubricant		0.047 gal/hr	410 gal/yr
Dross Press #2 (Flex Line) (MC-22) - Hot Aluminum Dross		14,435	63,225
Dross Press #1 (CBS Line) (MC-24) - Hot Aluminum Dross		14,435	63,225

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104):** MC-26 = 6.32
MC-34 = 6.32
MC-27 = 6.32
MC-28 = 6.32
MC-35 = 0.36 each **MMBtu/hr**

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. **Products of process or unit:**

Products	Quantity/year	Units of production
Melting & Casting Ingot Saw (MC-32) - Reject Ingots for Melting	63,552	ton/yr
DC1-DC4 Casting Unit- Lubricant Usage (MC-31) - Casting Lubricant	410	gal/yr
Dross Press #2 (Flex Line) (MC-22) - Cooled Aluminum Dross	63,225	tons/year
Dross Press #1 (CBS Line) (MC-24) - Cooled Aluminum Dross	63,225	tons/year

8. **For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):** Novelis requests BACT work practice standards for implementing good combustion and operating practices for the interior venting natural gas combustion systems covered by MC-26, MC-27, MC-28, **MC-34, and MC-35** Novelis requests BACT work practice standards for good operating and maintenance practices for casting lubricant usage covered by MC-31. Novelis requests PM BACT work practice standards for installing filtration unit controls on the ingot sawing process covered by MC-32. **Novelis request PM BACT work practice standards for installing baghouse controls on the dross press units covered by MC-22 and MC-24.** Compliance with the requested BACT control requirements will ensure compliance with all other applicable standards.

9. **Is there any emission control equipment on this emission source?**

☐ **Yes** ☑ **No (Where a control device exists, ADEM Form 110 must be completed and attached).**

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)	LAT	LONG								
MCFUG	N/A - Fugitive Source; Refer to Appendix A of Volume 2 Modeling Report of Initial PSD Application for Source Parameters											

*** Std temperature is 68ºF - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-22	PM	0.17	0.73	Grain Loading Design Basis	N/A	BACT Work Prac.
MC-22	PM10	0.16	0.69	EPA PM Calculator	N/A	BACT Work Prac.
MC-22	PM2.5	0.13	0.57	EPA PM Calculator	N/A	BACT Work Prac.
MC-22	NOX	--	--	--	--	--
MC-22	CO	--	--	--	--	--
MC-22	VOC	--	--	--	--	--
MC-22	SO2	--	--	--	--	--
MC-22	CO2e	--	--	--	--	--
MC-22	Pb	--	--	--	--	--
MC-22	THAP	--	--	--	--	--

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-24	PM	0.17	0.73	Grain Loading Design Basis	N/A	BACT Work Prac.
MC-24	PM10	0.16	0.69	EPA PM Calculator	N/A	BACT Work Prac.
MC-24	PM2.5	0.13	0.57	EPA PM Calculator	N/A	BACT Work Prac.
MC-24	NOX	--	--	--	--	--
MC-24	CO	--	--	--	--	--
MC-24	VOC	--	--	--	--	--
MC-24	SO2	--	--	--	--	--
MC-24	CO2e	--	--	--	--	--
MC-24	Pb	--	--	--	--	--
MC-24	THAP	--	--	--	--	--

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-26	PM	1.20E-02	5.26E-02	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	BACT Work Prac.
MC-26	PM10	2.19E-02	9.61E-02	Engineering Estimate and Engineering Estimate	N/A	BACT Work Prac.
MC-26	PM2.5	2.19E-02	9.61E-02	Engineering Estimate and Engineering Estimate	N/A	BACT Work Prac.
MC-26	NOX	0.48	2.11E+00	Vendor Estimate and Vendor Estimate	N/A	BACT Work Prac.
MC-26	CO	0.53	2.33E+00	AP-42 Table 1.4-1 and AP-42 Table 1.4-1	N/A	BACT Work Prac.
MC-26	VOC	0.03	0.15	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	BACT Work Prac.
MC-26	SO2	0.00	1.66E-02	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	N/A
MC-26	CO2e	740.06	3,241	40CFR98 Subpart A and 40CFR98 Subpart A	N/A	BACT Work Prac.
MC-26	Pb	3.16E-06	1.38E-05	AP-42 Table 1.4-4. and AP-42 Table 1.4-4.	N/A	N/A
MC-26	THAP	1.19E-02	5.23E-02	AP-42 Tables 1.4-3 & 1.4-4. and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-34	PM	1.20E-02	5.26E-02	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	BACT Work Prac.
MC-34	PM10	2.19E-02	9.61E-02	Engineering Estimate and Engineering Estimate	N/A	BACT Work Prac.
MC-34	PM2.5	2.19E-02	9.61E-02	Engineering Estimate and Engineering Estimate	N/A	BACT Work Prac.
MC-34	NOX	0.48	2.11E+00	Vendor Estimate and Vendor Estimate	N/A	BACT Work Prac.
MC-34	CO	0.53	2.33E+00	AP-42 Table 1.4-1 and AP-42 Table 1.4-1	N/A	BACT Work Prac.
MC-34	VOC	0.03	0.15	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	BACT Work Prac.
MC-34	SO2	0.00	1.66E-02	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	N/A
MC-34	CO2e	740.06	3,241	40CFR98 Subpart A and 40CFR98 Subpart A	N/A	BACT Work Prac.
MC-34	Pb	3.16E-06	1.38E-05	AP-42 Table 1.4-4. and AP-42 Table 1.4-4.	N/A	N/A
MC-34	THAP	1.19E-02	5.23E-02	AP-42 Tables 1.4-3 & 1.4-4. and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-27	PM	1.20E-02	5.26E-02	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	BACT Work Prac.
MC-27	PM10	2.19E-02	9.61E-02	Engineering Estimate and Engineering Estimate	N/A	BACT Work Prac.
MC-27	PM2.5	2.19E-02	9.61E-02	Engineering Estimate and Engineering Estimate	N/A	BACT Work Prac.
MC-27	NOX	0.48	2.11E+00	Vendor Estimate and Vendor Estimate	N/A	BACT Work Prac.
MC-27	CO	0.53	2.33E+00	AP-42 Table 1.4-1 and AP-42 Table 1.4-1	N/A	BACT Work Prac.
MC-27	VOC	0.03	0.15	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	BACT Work Prac.
MC-27	SO2	0.00	1.66E-02	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	N/A
MC-27	CO2e	740.06	3,241	40CFR98 Subpart A and 40CFR98 Subpart A	N/A	BACT Work Prac.
MC-27	Pb	3.16E-06	1.38E-05	AP-42 Table 1.4-4. and AP-42 Table 1.4-4.	N/A	N/A
MC-27	THAP	1.19E-02	5.23E-02	AP-42 Tables 1.4-3 & 1.4-4. and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-28	PM	1.20E-02	5.26E-02	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	BACT Work Prac.
MC-28	PM10	2.19E-02	9.61E-02	Engineering Estimate and Engineering Estimate	N/A	BACT Work Prac.
MC-28	PM2.5	2.19E-02	9.61E-02	Engineering Estimate and Engineering Estimate	N/A	BACT Work Prac.
MC-28	NOX	0.48	2.11E+00	Vendor Estimate and Vendor Estimate	N/A	BACT Work Prac.
MC-28	CO	0.53	2.33E+00	AP-42 Table 1.4-1 and AP-42 Table 1.4-1	N/A	BACT Work Prac.
MC-28	VOC	0.03	0.15	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	BACT Work Prac.
MC-28	SO2	0.00	1.66E-02	AP-42, Chp.1.4, Tbl 1.4-2 and AP-42, Chp.1.4, Tbl 1.4-2	N/A	N/A
MC-28	CO2e	740.06	3,241	40CFR98 Subpart A and 40CFR98 Subpart A	N/A	BACT Work Prac.
MC-28	Pb	3.16E-06	1.38E-05	AP-42 Table 1.4-4. and AP-42 Table 1.4-4.	N/A	N/A
MC-28	THAP	1.19E-02	5.23E-02	AP-42 Tables 1.4-3 & 1.4-4. and AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-35	PM	3.15E-02	1.38E-01	AP-42, Chp.1.4, Tbl 1.4-2	N/A	BACT Work Prac.
MC-35	PM10	5.75E-02	2.52E-01	Engineering Estimate	N/A	BACT Work Prac.
MC-35	PM2.5	5.75E-02	2.52E-01	Engineering Estimate	N/A	BACT Work Prac.
MC-35	NOX	1.66	7.25E+00	AP-42, Chp.1.4, Tbl 1.4-1	N/A	BACT Work Prac.
MC-35	CO	1.39	6.09E+00	AP-42, Chp.1.4, Tbl 1.4-1	N/A	BACT Work Prac.
MC-35	VOC	0.09	0.40	AP-42, Chp.1.4, Tbl 1.4-2	N/A	BACT Work Prac.
MC-35	SO2	0.01	4.35E-02	AP-42, Chp.1.4, Tbl 1.4-2	N/A	N/A
MC-35	CO2e	1939.13	8,493	40CFR98 Subpart A	N/A	BACT Work Prac.
MC-35	Pb	8.28E-06	3.63E-05	AP-42 Table 1.4-4.	N/A	N/A
MC-35	THAP	3.13E-02	1.37E-01	AP-42 Tables 1.4-3 & 1.4-4.	N/A	N/A

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-31	PM	--	--	--	N/A	BACT Work Prac.
MC-31	PM10	--	--	--	N/A	BACT Work Prac.
MC-31	PM2.5	--	--	--	N/A	BACT Work Prac.
MC-31	NOX	--	--	--	N/A	BACT Work Prac.
MC-31	CO	--	--	--	N/A	BACT Work Prac.
MC-31	VOC	**0.33**	**1.43**	Mass Balance (Assuming 100% Loss)	N/A	BACT Work Prac.
MC-31	SO2	--	--	--	N/A	N/A
MC-31	CO2e	--	--	--	N/A	BACT Work Prac.
MC-31	Pb	--	--	--	N/A	N/A
MC-31	THAP	--	--	--	N/A	N/A

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
MC-32	PM	1.10E-02	4.71E-03	Engineering Estimate	N/A	BACT Work Prac.
MC-32	PM10	1.10E-02	4.71E-03	Engineering Estimate	N/A	BACT Work Prac.
MC-32	PM2.5	1.10E-02	4.71E-03	Engineering Estimate	N/A	BACT Work Prac.
MC-32	NOX	--	--	--	--	--
MC-32	CO	--	--	--	--	--
MC-32	VOC	2.65	1.13	Engineering Estimate	2.65	BACT
MC-32	SO2	--	--	--	--	--
MC-32	CO2e	--	--	--	--	--
MC-32	Pb	--	--	--	--	--
MC-32	THAP	2.15E-04	9.18E-05	Sum of (Mn, Cr, Ni)	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 105 Forms - Hot Rolling Mill

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (HOT ROLLING MILL)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Mill Building Fugitives- Including Hot Reversing Mill Uncaptured Emissions (HR-10), Hot Finishing Mill Uncaptured Emissions (HR-11), Tandem Cold Mill #1 Uncaptured Emissions (CR-01)

Make: Various/Custom **Model:** Various/Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. **Materials (feed input) used in unit or process (include solid fuel materials used, if any):**

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
~~Hot Rolling Ingot Saws (4) (HR-01) - Cast Ingot~~		--	--
Hot Reversing Mill (HR-10) - Scalped Ingot		669,285	2,065,454
Hot Finishing Mill (HR-11) - Hot Rolled Slab		637,829	1,968,377
Tandem Cold Mill #1 (CR-01) - Hot Rolled Coils		620,000	1,099,680

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104):** N/A **MMBtu/hr**

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	**Btu/lb**				
Fuel Oil	N/A	**Btu/gal**				
Natural Gas	N/A	**Btu/ft^3**				
L. P. Gas	N/A	**Btu/ft^3**				
Wood	N/A	**Btu/lb**				
Other (specify)	N/A					

7. **Products of process or unit:**

Products	Quantity/year	Units of production
~~Hot Rolling Ingot Saws (4) (HR-01) - Cut Ingot~~	--	~~ton/yr~~
Hot Reversing Mill (HR-10) - Hot Rolled Slab	2,065,454	ton/yr
Hot Finishing Mill (HR-11) - Hot Rolled Coil	1,968,377	ton/yr
Tandem Cold Mill #1 (CR-01) - Cold Rolled Coils	1,099,680	ton/yr

8. **For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):** ~~Novelis requests PM BACT work practice standards for installing filtration unit controls on the ingot sawing process covered by HR-01. Novelis requests VOC BACT work practice standards for implementing good operating and maintenance practices for the ingot saw lubricant usage.~~ Novelis requests PM and VOC BACT work practice standards for implementing good operating and maintenance practices for uncaptured emissions generated by the hot rolling process covered by HR-10 and HR-11 and cold rolling process covered by CR-01. Compliance with the requested BACT control requirements will ensure compliance with all other applicable standards.

9. **Is there any emission control equipment on this emission source?**

☐ **Yes** ☑ **No (Where a control device exists, ADEM Form 110 must be completed and attached).**

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
MBRV	N/A - Fugitive Source; Refer to Appendix A of Volume 2 Modeling Report of Initial PSD Application for Source Parameters											

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HR-10	PM	0.08	0.26	Grain Loading Design Basis	N/A	BACT Work Prac.
HR-10	PM10	0.12	0.39	Similar Source Test Data	N/A	BACT Work Prac.
HR-10	PM2.5	0.10	0.32	Similar Source Test Data	N/A	BACT Work Prac.
HR-10	NOX	--	--	--	--	--
HR-10	CO	--	--	--	--	--
HR-10	VOC	6.44	4.44	Similar Source Test Data + Mass Balance (Assuming 100% Loss of Bite Aid)	N/A	BACT Work Prac.
HR-10	SO2	--	--	--	--	--
HR-10	CO2e	--	--	--	--	--
HR-10	Pb	--	--	--	--	--
HR-10	THAP	--	--	--	--	--

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HR-11	PM	0.09	0.28	Grain Loading Design Basis	N/A	BACT Work Prac.
HR-11	PM10	0.13	0.40	Similar Source Test Data	N/A	BACT Work Prac.
HR-11	PM2.5	0.11	0.35	Similar Source Test Data	N/A	BACT Work Prac.
HR-11	NOX	--	--	--	--	--
HR-11	CO	--	--	--	--	--
HR-11	VOC	4.87	8.39	Similar Source Test Data + Mass Balance (Assuming 100% Loss of Bite Aid)	N/A	BACT Work Prac.
HR-11	SO2	--	--	--	--	--
HR-11	CO2e	--	--	--	--	--
HR-11	Pb	--	--	--	--	--
HR-11	THAP	--	--	--	--	--

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
CR-01	PM	0.08	0.29	Grain Loading Design Basis	N/A	BACT Work Prac.
CR-01	PM10	0.05	0.16	Similar Source Test Data	N/A	BACT Work Prac.
CR-01	PM2.5	0.01	0.04	Similar Source Test Data	N/A	BACT Work Prac.
CR-01	NOX	--	--	--	--	--
CR-01	CO	--	--	--	--	--
CR-01	VOC	2.41	8.38	Similar Source Test Data	N/A	BACT Work Prac.
CR-01	SO2	--	--	--	--	--
CR-01	CO2e	--	--	--	--	--
CR-01	Pb	--	--	--	--	--
CR-01	THAP	--	--	--	--	--

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (HOT ROLLING MILL)

			-					-				

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Ingot Scalper #1

Make: SNK/Kirk & Blum **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Cast Aluminum Ingot		1,250,100	2,118,414

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Scalped Aluminum Ingot	2,118,414	tons/year
Scalper Chips	46,771	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM ad VOC BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
SCLP1	429.02	3,424.40			145	Refer to BPIP Output	265	5.50	N/A	54.8	78,063	80

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HR-02	PM	**0.65**	**1.11**	Grain Loading Design Basis	**0.65**	BACT
HR-02	PM10	**0.65**	**1.11**	Grain Loading Design Basis	**0.65**	BACT
HR-02	PM2.5	**0.65**	**1.11**	Grain Loading Design Basis	**0.65**	BACT
HR-02	NOX	--	--	--	--	--
HR-02	CO	--	--	--	--	--
HR-02	VOC	**20.31**	34.42	UPL of Similar Src. Test Data	**20.31**	BACT
HR-02	SO2	--	--	--	--	--
HR-02	CO2e	--	--	--	--	--
HR-02	Pb	--	--	--	--	--
HR-02	THAP	**0.01**	**0.02**	Sum of (Mn, Cr, Ni)	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 04/03/2026

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (HOT ROLLING MILL)

			-					-				

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Pneumatic Conveyor for Briquetter #1

Make: Various/Custom **Model:**

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Chips		27,600	46,771

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Aluminum Chips	46,771	ton/yr

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☐ Yes ☑ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
PCBQ1	429.02	3,424.40			145.0	Refer to BPIP Output	265	5.50	N/A	7.7	6,020	80

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HR-03	PM	**0.19**	**0.32**	Similar Source Test Data	**0.19**	BACT
HR-03	PM10	**0.10**	**0.16**	Similar Source Test Data	**0.10**	BACT
HR-03	PM2.5	**0.10**	**0.16**	Similar Source Test Data	**0.10**	BACT
HR-03	NOX	--	--	--	--	--
HR-03	CO	--	--	--	--	--
HR-03	VOC	--	--	--	--	--
HR-03	SO2	--	--	--	--	--
HR-03	CO2e	--	--	--	--	--
HR-03	Pb	--	--	--	--	--
HR-03	THAP	**3.64E-03**	**6.17E-03**	Sum of (Mn, Cr, Ni)	--	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (HOT ROLLING MILL)

			-					-				

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Pusher Furnace #1

Make: EBNER **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Ingots		223,095	688,485

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 104.9 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Preheated Aluminum Ingots	688,485	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☐ Yes ☑ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
PF1	429.41	3,424.49			98	Refer to BPIP Output	265	10.50	N/A	14.3	74,378	482

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HR-07	PM	0.39	1.19	Logan Stack Test Feb. 2019	0.39	BACT
HR-07	PM10	0.48	1.48	Logan Stack Test Feb. 2019	0.48	BACT
HR-07	PM2.5	0.48	1.48	Logan Stack Test Feb. 2019	0.48	BACT
HR-07	NOX	14.33	29.18	--	14.33	BACT
HR-07	CO	6.98	14.21	--	6.98	BACT
HR-07	VOC	0.44	0.90	--	0.44	BACT
HR-07	SO2	0.06	0.13	--	419.6	4.0 lb/MMBtu
HR-07	CO2e	**12,284**	**25,012**	--	**25,012 tpy**	BACT
HR-07	Pb	5.25E-05	1.07E-04	--	N/A	N/A
HR-07	THAP	0.20	0.40	--	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (HOT ROLLING MILL)

			-					-				

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Pusher Furnace #2

Make: EBNER **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Ingots		223,095	688,485

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 104.9 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Preheated Aluminum Ingots	688,485	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☐ Yes ☑ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
PF2	429.43	3,424.49			98	Refer to BPIP Output	265	10.50	N/A	14.3	74,378	482

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HR-08	PM	0.39	1.19	Logan Stack Test Feb. 2019	0.39	BACT
HR-08	PM10	0.48	1.48	Logan Stack Test Feb. 2019	0.48	BACT
HR-08	PM2.5	0.48	1.48	Logan Stack Test Feb. 2019	0.48	BACT
HR-08	NOX	14.33	29.18	--	14.33	BACT
HR-08	CO	6.98	14.21	--	6.98	BACT
HR-08	VOC	0.44	0.90	--	0.44	BACT
HR-08	SO2	0.06	0.13	--	419.6	4.0 lb/MMBtu
HR-08	CO2e	**12,284**	**25,012**	--	**25,012 tpy**	BACT
HR-08	Pb	5.25E-05	1.07E-04	--	N/A	N/A
HR-08	THAP	0.20	0.40	--	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (HOT ROLLING MILL)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Pusher Furnace #3

Make: EBNER **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Ingots		223,095	688,485

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 104.9 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Preheated Aluminum Ingots	688,485	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☐ Yes ☑ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
PF3	429.45	3,424.49			98	Refer to BPIP Output	265	10.50	N/A	14.3	74,378	482

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HR-09	PM	0.39	1.19	Logan Stack Test Feb. 2019	0.39	BACT
HR-09	PM10	0.48	1.48	Logan Stack Test Feb. 2019	0.48	BACT
HR-09	PM2.5	0.48	1.48	Logan Stack Test Feb. 2019	0.48	BACT
HR-09	NOX	14.33	29.18	--	14.33	BACT
HR-09	CO	6.98	14.21	--	6.98	BACT
HR-09	VOC	0.44	0.90	--	0.44	BACT
HR-09	SO2	0.06	0.13	--	419.6	4.0 lb/MMBtu
HR-09	CO2e	**12,284**	**25,012**	--	**25,012 tpy**	BACT
HR-09	Pb	5.25E-05	1.07E-04	--	N/A	N/A
HR-09	THAP	0.20	0.40	--	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (HOT ROLLING MILL)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Hot Reversing Mill

Make: Danieli **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Ingot		669,285	2,065,454

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Aluminum Slab	2,065,454	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM and VOC BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
HRM	429.35	3,424.60			150	Refer to BPIP Output	265	12.0	N/A	32.1	217,500	130

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HR-10	PM	3.20	9.87	Grain Loading Design Basis	3.20	BACT
HR-10	PM10	7.07	21.82	Similar Source Test Data	7.07	BACT
HR-10	PM2.5	6.50	20.06	Similar Source Test Data	6.50	BACT
HR-10	NOX	--	--	--	--	--
HR-10	CO	--	--	--	--	--
HR-10	VOC	57.97	39.96	Similar Source Test Data + Mass Balance (Assuming 100% Loss of Bite Aid)	57.97	BACT
HR-10	SO2	--	--	--	--	--
HR-10	CO2e	--	--	--	--	--
HR-10	Pb	--	--	--	--	--
HR-10	THAP	--	--	--	--	--

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (HOT ROLLING MILL)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Hot Finishing Mill

Make: Danieli **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Slab		637,829	1,968,377

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Aluminum Strip	1,968,377	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM and VOC BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
HFM	429.03	3,424.61			150	Refer to BPIP Output	265	17	N/A	31.9	435,000	130

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HR-11	PM	6.36	19.61	Grain Loading Design Basis	6.36	BACT
HR-11	PM10	14.44	44.55	Similar Source Test Data	14.44	BACT
HR-11	PM2.5	13.03	40.22	Similar Source Test Data	13.03	BACT
HR-11	NOX	--	--	--	--	--
HR-11	CO	--	--	--	--	--
HR-11	VOC	92.57	159.48	Similar Source Test Data + Mass Balance (Assuming 100% Loss of Bite Aid)	92.57	BACT
HR-11	SO2	--	--	--	--	--
HR-11	CO2e	--	--	--	--	--
HR-11	Pb	--	--	--	--	--
HR-11	THAP	--	--	--	--	--

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 105 Forms - Cold Rolling Mill

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (COLD ROLLING MILL)

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Tandem Cold Mill

Make: SMS **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Hot Rolled Aluminum Coils		620,000	1,099,680

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Cold Rolled Aluminum Coils	1,099,680	tons/year

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Novelis requests PM and VOC BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
TCM1	428.59	3424.61			120	Refer to BPIP Output	265	11	N/A	27.3	142,000	74.7

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
CR-01	PM	2.34	8.15	Grain Loading Design Basis	2.34	BACT
CR-01	PM10	2.22	7.72	Similar Source Test Data	2.22	BACT
CR-01	PM2.5	1.98	6.90	Similar Source Test Data	1.98	BACT
CR-01	NOX	--	--	--	--	--
CR-01	CO	--	--	--	--	--
CR-01	VOC	22.87	79.59	Similar Source Test Data	22.87	BACT
CR-01	SO2	--	--	--	--	--
CR-01	CO2e	--	--	--	--	--
CR-01	Pb	--	--	--	--	--
CR-01	THAP	--	--	--	--	--

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 105 Forms - Coil Finishing Area

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (COIL FINISHING AREA)

			-					-			

Do not write in this space

1. **Name of facility or organization:** Novelis Corp. - Bay Minette Facility

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Coating Line #1 - Including Tension Leveler, Alkaline Cleaning Line and Roll Coaters

Make: Danieli **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2023 **Proposed installation date:** 2023

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Tension Leveler Lubricant		0.4 gal/hr	3,664 gal/yr
Aluminum Strip Surface Area		336.09 Mft2/hr	2,944,111 Mft2/yr
Aluminum Coil		38,801	169,948

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 44.1 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Aluminum Coil	169,948	ton/yr

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

For the Tension Leveler, Novelis requests VOC BACT work practice standards for implementing good operating and maintenance practices for the lubricant application process. For the Alkaline Cleaning Line and Coating Line roll coaters, Novelis requests BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
Tension Leveler	N/A- Fugitive source of VOC emissions only; Not included in modeling analysis											
ALKCLN1	428.53	3,424.35			98	Refer to BPIP Output	265	2.0	N/A	41.8	7,653	131
CL1	428.52	3,424.42			95.1	Refer to BPIP Output	265	6.6	N/A	30.9	62,676	428

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended. (Emissions presented here are the sum of the emissions from aluminum metal production & natural gas combustion.)

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
CF-01	PM	--	--	--	--	--
CF-01	PM10	--	--	--	--	--
CF-01	PM2.5	--	--	--	--	--
CF-01	NOX	--	--	--	--	--
CF-01	CO	--	--	--	--	--
CF-01	VOC	**2.87**	**12.59**	100% Loss as VOC	N/A	BACT Work Prac.
CF-01	SO2	--	--	--	--	--
CF-01	CO2e	--	--	--	--	--
CF-01	Pb	--	--	--	--	--
CF-01	THAP	--	--	--	--	--

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
CF-02	PM	**0.14**	**0.63**	Vendor Estimate	0.14	BACT
CF-02	PM10	**0.14**	**0.63**	Vendor Estimate	0.14	BACT
CF-02	PM2.5	**0.14**	**0.63**	Vendor Estimate	0.14	BACT
CF-02	NOX	--	--	--	--	--
CF-02	CO	--	--	--	--	--
CF-02	VOC	**0.08**	**0.36**	Engineering Estimate	0.08	BACT
CF-02	SO2	--	--	--	--	--
CF-02	CO2e	--	--	--	--	--
CF-02	Pb	--	--	--	--	--
CF-02	THAP	--	--	--	--	--

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
CF-03	PM	2.73	11.95	RTO Emissions Performance Spec.	2.73	BACT
CF-03	PM10	2.64	11.56	PM Calculator	2.64	BACT
CF-03	PM2.5	2.22	9.71	PM Calculator	2.22	BACT
CF-03	NOX	6.61	28.97	RTO Emissions Performance Spec.	6.61	BACT
CF-03	CO	13.23	57.94	RTO Emissions Performance Spec.	13.23	BACT
CF-03	VOC	2.89	12.65	RTO Emissions Performance Spec.	2.89	BACT
CF-03	SO2	0.03	0.12	AP-42 Table 1.4-2	176.2	4.0 lb/MMBtu
CF-03	CO2e	5,159	22,598	40 CFR 98 Subpart C	22,598 tpy	BACT
CF-03	Pb	2.20E-05	9.65E-05	AP-42 Table 1.4-4	N/A	N/A
CF-03	THAP	2.73	11.95	AP-42 Tables 1.4-3 & 1.4-4	N/A	N/A

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook Date: 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (COIL FINISHING AREA)

			-					-			

Do not write in this space

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Edge Trimmer - Electrostatic Oiler

Make: Danieli Model: Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2024 Proposed installation date: 2025

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. Normal operating schedule:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. **Materials (feed input) used in unit or process (include solid fuel materials used, if any):**

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Aluminum Strip Surface Area		238.65 Mm2/hr	2,090,574 Mm2/yr
Lubricant		38.94 gal/hr	341,090 gal/yr

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104):** N/A **MMBtu/hr**

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. **Products of process or unit:**

Products	Quantity/year	Units of production
Trimmed Aluminum Strip	2,090,574	Mm2/yr

8. **For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):**

For the Electrostatic Oiler, Novelis requests VOC and PM BACT work practice standards for implementing good operating and maintenance practices and lubricant usage limitations.

9. **Is there any emission control equipment on this emission source?**

☐ Yes ☑ No **(Where a control device exists, ADEM Form 110 must be completed and attached).**

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
Edge Trimmer - Electrostatic Oiler	N/A- Fugitive source of VOC and PM emissions only; Not included in modeling analysis											

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
CF-04	PM	0.57	2.49	--	N/A	BACT Work Prac.
CF-04	PM10	0.57	2.49	--	N/A	BACT Work Prac.
CF-04	PM2.5	0.57	2.49	--	N/A	BACT Work Prac.
CF-04	NOX	--	--	--	--	--
CF-04	CO	--	--	--	--	--
CF-04	VOC	1.92	8.41	--	N/A	BACT Work Prac.
CF-04	SO2	--	--	--	--	--
CF-04	CO2e	--	--	--	--	--
CF-04	Pb	--	--	--	--	--
CF-04	THAP	--	--	--	--	--

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION (COIL FINISHING AREA)

Do not write in this space

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Edge Trimmer - Scrap Baller

Make: Danieli Model: Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2024 Proposed installation date: 2025

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. Normal operating schedule:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Scrap Aluminum Shavings		13.0 ton/hr	113,880 ton/yr

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Baled Aluminum Scrap	113,880	ton/yr

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

For the Scrap Baller, Novelis requests PM BACT work practice standards for implementing good operating and maintenance practices.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
CF-05	428.64	3,424.43	30.951175	-87.74714	85.2		265	2.2		15.2	3,590	68

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
CF-05	PM	0.27	1.18	--	N/A	BACT Work Prac.
CF-05	PM10	0.27	1.18	--	N/A	BACT Work Prac.
CF-05	PM2.5	0.27	1.18	--	N/A	BACT Work Prac.
CF-05	NOX	--	--	--	--	--
CF-05	CO	--	--	--	--	--
CF-05	VOC	--	--	--	--	--
CF-05	SO2	--	--	--	--	--
CF-05	CO2e	--	--	--	--	--
CF-05	Pb	--	--	--	--	--
CF-05	THAP	--	--	--	--	--

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ **Yes** ☐ **No**

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ **Yes** ☑ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ **Yes** ☑ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 105 Forms - Auxiliary Systems

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING OPERATION

(COIL FINISHING AREA)

Do not write in this space

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number N/A

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Building Heating Systems including (30 MAU @ 11.55 MMBtu/hr, 4 MAU @ 7.50 MMBtu/hr, 2 MAU @ 3.75 MMBtu/hr, 1 MAU @ 2.25 MMBtu/hr, 7 Units @ 0.175 MMBtu/hr, 12 Units @ 1.50 MMBtu/hr, 6 Units @ 0.105 MMBtu/hr, and 4 Units @ 0.045 MMBtu/hr

Make: MOFFITT and Reznor Heaters Model: Various

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour:

Manufactured date: 2024 Proposed installation date: 2025

Original installation date (if existing): N/A

Reconstruction or Modification date (if applicable): N/A

4. Normal operating schedule:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 390.1 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft^3				
L. P. Gas	N/A	Btu/ft^3				
Wood	N/A	Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

For the Building Heating System covered by AS-19a through AS19h, Novelis requests the annual operational limit of 486.7MMscf/yr.

Additionally, Novelis requests a daily average operational limit of 0.168 MMscf/hr.

At ADEM's request, Novelis is prepared to accept a maximum hourly usage rate of 0.390 MMscf/hr in addition to the annual and daily average limits proposed.

9. Is there any emission control equipment on this emission source?

☐ Yes ☑ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack											
	UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
AS-19a	N/A - Heating units vent into building and are released as a fugitives through building vents. Refer to Appendix A of Volume 2 Modeling Report of Initial PSD Application for Source Parameters on building fugitives											
AS-19b	N/A - Heating units vent into building and are released as a fugitives through building vents. Refer to Appendix A of Volume 2 Modeling Report of Initial PSD Application for Source Parameters on building fugitives											
AS-19c	N/A - Heating units vent into building and are released as a fugitives through building vents. Refer to Appendix A of Volume 2 Modeling Report of Initial PSD Application for Source Parameters on building fugitives											
AS-19d	N/A - Heating units vent into building and are released as a fugitives through building vents. Refer to Appendix A of Volume 2 Modeling Report of Initial PSD Application for Source Parameters on building fugitives											
AS-19e	N/A - Heating units vent into building and are released as a fugitives through building vents. Refer to Appendix A of Volume 2 Modeling Report of Initial PSD Application for Source Parameters on building fugitives											
AS-19f	N/A - Heating units vent into building and are released as a fugitives through building vents. Refer to Appendix A of Volume 2 Modeling Report of Initial PSD Application for Source Parameters on building fugitives											
AS-19g	N/A - Heating units vent into building and are released as a fugitives through building vents. Refer to Appendix A of Volume 2 Modeling Report of Initial PSD Application for Source Parameters on building fugitives											
AS-19h	N/A - Heating units vent into building and are released as a fugitives through building vents. Refer to Appendix A of Volume 2 Modeling Report of Initial PSD Application for Source Parameters on building fugitives											

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
AS-19a - AS-19h	PM	0.74	0.46	AP-42 Table 1.4-2	--	--
AS-19a - AS-19h	PM10	1.35	0.84	AP-42 Table 1.4-2 + EPA Speciate DB	--	--
AS-19a - AS-19h	PM2.5	1.35	0.84	AP-42 Table 1.4-2 + EPA Speciate DB	--	--
AS-19a - AS-19h	NOX	39.01	24.33	AP-42 Table 1.4-1	--	--
AS-19a - AS-19h	CO	32.77	20.44	AP-42 Table 1.4-1	--	--
AS-19a - AS-19h	VOC	2.15	1.34	AP-42 Table 1.4-2	--	--
AS-19a - AS-19h	SO2	0.23	0.15	AP-42 Table 1.4-2	--	--
AS-19a - AS-19h	CO2e	45,678	28,494	40 CFR 98 Subpart C	--	--
AS-19a - AS-19h	Pb	1.95E-04	1.22E-04	AP-42 Tables 1.4-4.	--	--
AS-19a - AS-19h	THAP	0.74	0.46	AP-42 Tables 1.4-3 & 1.4-4.	--	--

12. Using a flow diagram:

See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(☑ Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
N/A			

Name of person preparing application: John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 107 Forms - Engines

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. an engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ■ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, please describe: _____

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: _____

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _____

3. Engine Identification:

A. Manufacturer's Name: Kohler/Rehlko B. Model Number: KG10V08T-6DGS C. Model Year: 2024

D. Facility's Identification Number or Description: Emergency Generator Engine #1 (Security Office) (AS-06-1) E. Serial Number: _____

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2024 B. Date Manufactured: 2024 C. Date Modified/Reconstructed: _____

D. For a used engine, approximate date engine was first placed into service at any location: _____

5. Engine Function: ☐ Compression ☑ Electrical Generation (Maximum Electrical Output): 200 kW ☐ Fire/Other Pump Driver

☐ NFPA Certified ☐ Research & Development ☐ Test Cell/Stand ☐ Other, please describe: _____

6. Engine Operation: ☑ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: _____ B. Days Per Week: _____ C. Weeks per Year: _____

D. Peak Season (if any): _____

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 304 B. Maximum Engine Power (kWm): 227 C. Maximum Heat Input (MMBtu/hr): 2.40

D. Type: ☐ Simple Cycle Turbine ☐ Combined Cycle Turbine ☐ Regenerative Cycle Turbine ☑ Reciprocating Engine

E. Piston Movement: ☐ 2-Stroke RICE ☑ 4-Stroke RICE ☐ N/A ☐ Other: _____

F. Air/Fuel Mix: ☐ Rich Burn RICE ☑ Lean Burn RICE ☐ Diffusion Flame Turbine ☐ Lean Premix Turbine ☐ Other: _____

G. Ignition Type: ☑ Spark ☐ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): 1.29

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: _____ C. Location on well? ☐ Yes ☑ No

D. Compressor Installation Date: _____ E. Compressor Serial Number: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Natural Gas	1,000	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.024	5.99E-03	N/A	N/A	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)	
NOX	0.100	0.025	N/A	N/A	Vendor estimate	
CO	0.200	0.050	N/A	N/A	Vendor estimate	
VOC	0.015	3.75E-03	N/A	N/A	Vendor estimate	
SO2	1.41E-03	3.53E-04	N/A	N/A	AP-42 Tables 3.2-2, 10/24	
Formaldehyde	6.88E-03	1.72E-03	N/A	N/A	AP-42 Table 3.2-2, 10/24	
THAP	2.68E-01	6.69E-02	N/A	N/A	AP-42 Tables 3.2-2 and 1.4-4	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☑ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx	2.0	g/hp-hr	NSPS Subpart JJJJ	**0.15 g/HP-hr**
CO	4.0	g/hp-hr	NSPS Subpart JJJJ	**0.30 g/HP-hr**
VOC	1.0	g/hp-hr	NSPS Subpart JJJJ	**0.02 g/HP-hr**

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A. UTM Coordinate (E-W) (km):	427.602	B. UTM Coordinate (N-S) (km):	3424.244	C. Height above grade (ft):	6.39
D. Latitude:	30.94943	E. Longitude:	-87.75795	G. Exhaust Gas Volume (ACFM):	1,469
H. Inside Diameter at Exit (round) (ft):	0.42	I. Base Elevation (ft):	265	J. Exhaust Gas Temperature (°F):	1,407
K. Inside Area at Exit (not round) (sq. ft.):	0.139	L. GEP Stack Height (ft):	N/A		

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. RKHXB10.3TNL-008

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

KOHLER®

KG200

60 Hz. Gas Generator Set
EPA Certified for Stationary Emergency Applications
EMISSION DATA SHEET

ENGINE INFORMATION

Model:	KG10V08T-6DGS	Bore:	116.8mm (4.6 in.)
Max kW @ 1800 RPM:	227 (NG) 178 (LPG)	Stroke:	120.6mm (4.7 in.)
Type:	4-Cycle,V8 Cylinder	Displacement:	10.3 L (632 cu. in.)
Aspiration:	Turbocharged	EPA Family:	RKHXB10.3TNL
Compression Ratio:	9.3:1	EPA Certificate:	RKHXB10.3TNL-008
Catalyst Required:	Yes		

EXHAUST EMISSION DATA[1] (g/kW-hr):

	LPG	NG
CO_2	833	600
NOx	0.15	0.20
THC/VOC[2]	0.03	0.03
CO	0.54	0.40
BSFC	294	219

1) Emissions shown are certified third-party zero-hour data points suitable for site permitting calculations

2) LPG as THC, NG as VOC

TEST METHODS AND CONDITIONS

Standby and overload ratings based on ISO 3046. Continuous ratings based on ISO 8528.
Max power rating is measured at the flywheel operating at standard conditions in a test cell.
Production tolerances in engines and installed components can account for power variations of +/- 5%. Corrections for altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

Electrical ratings are an estimate based on assumed fan and generator losses and may vary depending on actual equipment losses.
Emission rates are based on multi-mode, cycle-weighted testing in accordance with EPA regulations.
BSFC is based on cycle-weighted gross flywheel power rating and does not include fan or generator losses.

Data was taken from a single engine test according to EPA engine test methods, fuel specifications and reference conditions and is subject to instrumentation and engine-to-engine variability. Tests conducted with alternate test methods, instrumentation, fuel or reference conditions may yield different results.

Data and specifications subject to change without notice.

BOM-SUP-CAT-001-SECURITY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2024 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Kohler Co. (U.S. Manufacturer or Importer) **Certificate Number: RKHXB10.3TNL-008**	**Effective Date:** 12/01/2023 **Expiration Date:** 12/31/2024	Byron J. Bunker, Division Director Compliance Division	**Issue Date:** 12/01/2023 **Revision Date:** N/A

Manufacturer: Kohler Co.
Engine Family: RKHXB10.3TNL
Mobile/Stationary Certification Type: Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Emission Standards :
Stationary Part 1048
NMHC + NOx (g/kW-hr) : 2.7
CO (g/kW-hr) : 4.4
HC + NOx (g/kW-hr) : 2.7
Part 60 Subpart JJJ Table 1
VOC (g/Hp-hr) : 1.0
NOx (g/Hp-hr) : 2.0
CO (g/Hp-hr) : 4.0
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60, 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60, 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60, 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60, 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60, 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

____ – ____ – ____

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. an engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ■ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, please describe: _____

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: _____

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _____

3. Engine Identification:

A. Manufacturer's Name: Kohler/Rehlko B. Model Number: KG10V08T-6DGS C. Model Year: 2024

D. Facility's Identification Number or Description: Emergency Generator Engine #2 (Admin. Building) (AS-07-1) E. Serial Number: _____

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2024 B. Date Manufactured: 2024 C. Date Modified/Reconstructed: _____

D. For a used engine, approximate date engine was first placed into service at any location: _____

5. Engine Function: ☐ Compression ☑ Electrical Generation (Maximum Electrical Output): 200 kW ☐ Fire/Other Pump Driver

☐ NFPA Certified ☐ Research & Development ☐ Test Cell/Stand ☐ Other, please describe: _____

6. Engine Operation: ☑ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: _____ B. Days Per Week: _____ C. Weeks per Year: _____

D. Peak Season (if any): _____

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 304 B. Maximum Engine Power (kWm): 226.7 C. Maximum Heat Input (MMBtu/hr): 2.40

D. Type: ☐ Simple Cycle Turbine ☐ Combined Cycle Turbine ☐ Regenerative Cycle Turbine ☑ Reciprocating Engine

E. Piston Movement: ☐ 2-Stroke RICE ☑ 4-Stroke RICE ☐ N/A ☐ Other: _____

F. Air/Fuel Mix: ☐ Rich Burn RICE ☑ Lean Burn RICE ☐ Diffusion Flame Turbine ☐ Lean Premix Turbine ☐ Other: _____

G. Ignition Type: ☑ Spark ☐ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): 1.29

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: _____ C. Location on well? ☐ Yes ☑ No

D. Compressor Installation Date: _____ E. Compressor Serial Number: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Natural Gas	1,000	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.024	5.99E-03	N/A	N/A	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)	
NOX	0.100	0.025	N/A	N/A	Vendor estimate	
CO	0.200	0.050	N/A	N/A	Vendor estimate	
VOC	0.015	3.75E-03	N/A	N/A	Vendor estimate	
SO2	1.41E-03	3.53E-04	N/A	N/A	AP-42 Tables 3.2-2, 10/24	
Formaldehyde	6.88E-03	1.72E-03	N/A	N/A	AP-42 Table 3.2-2, 10/24	
THAP	2.68E-01	6.69E-02	N/A	N/A	AP-42 Tables 3.2-2 and 1.4-4	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☑ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx	2.0	g/hp-hr	NSPS Subpart JJJJ	**0.15 g/HP-hr**
CO	4.0	g/hp-hr	NSPS Subpart JJJJ	**0.30 g/HP-hr**
VOC	1.0	g/hp-hr	NSPS Subpart JJJJ	**0.02 g/HP-hr**

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A. UTM Coordinate (E-W) (km):	428.84	B. UTM Coordinate (N-S) (km):	3424.666	C. Height above grade (ft):	6.39
D. Latitude:	30.95331	E. Longitude:	-87.74503	G. Exhaust Gas Volume (ACFM):	1,469
H. Inside Diameter at Exit (round) (ft):	0.42	I. Base Elevation (ft):	265	J. Exhaust Gas Temperature (°F):	1,407
K. Inside Area at Exit (not round) (sq. ft.):	0.139	L. GEP Stack Height (ft):	N/A		

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. RKHXB10.3TNL-008

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

KOHLER®

KG200

60 Hz. Gas Generator Set
EPA Certified for Stationary Emergency Applications
EMISSION DATA SHEET

ENGINE INFORMATION

Model:	KG10V08T-6DGS	Bore:	116.8mm (4.6 in.)
Max kW @ 1800 RPM:	227 (NG) 178 (LPG)	Stroke:	120.6mm (4.7 in.)
Type:	4-Cycle,V8 Cylinder	Displacement:	10.3 L (632 cu. in.)
Aspiration:	Turbocharged	EPA Family:	RKHXB10.3TNL
Compression Ratio:	9.3:1	EPA Certificate:	RKHXB10.3TNL-008
Catalyst Required:	Yes		

EXHAUST EMISSION DATA[1] (g/kW-hr):

	LPG	NG
CO_2	833	600
NOx	0.15	0.20
THC/VOC[2]	0.03	0.03
CO	0.54	0.40
BSFC	294	219

1) Emissions shown are certified third-party zero-hour data points suitable for site permitting calculations

2) LPG as THC, NG as VOC

TEST METHODS AND CONDITIONS

Standby and overload ratings based on ISO 3046. Continuous ratings based on ISO 8528.
Max power rating is measured at the flywheel operating at standard conditions in a test cell.
Production tolerances in engines and installed components can account for power variations of +/- 5%. Corrections for altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

Electrical ratings are an estimate based on assumed fan and generator losses and may vary depending on actual equipment losses.
Emission rates are based on multi-mode, cycle-weighted testing in accordance with EPA regulations.
BSFC is based on cycle-weighted gross flywheel power rating and does not include fan or generator losses.

Data was taken from a single engine test according to EPA engine test methods, fuel specifications and reference conditions and is subject to instrumentation and engine-to-engine variability. Tests conducted with alternate test methods, instrumentation, fuel or reference conditions may yield different results.

Data and specifications subject to change without notice.

BOM-SUP-CAT-001 ADMIN

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2024 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Kohler Co. (U.S. Manufacturer or Importer) **Certificate Number: RKHXB10.3TNL-008**	**Effective Date:** 12/01/2023 **Expiration Date:** 12/31/2024	Byron J. Bunker, Division Director Compliance Division	**Issue Date:** 12/01/2023 **Revision Date:** N/A

Manufacturer: Kohler Co.
Engine Family: RKHXB10.3TNL
Mobile/Stationary Certification Type: Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Emission Standards :
Stationary Part 1048
NMHC + NOx (g/kW-hr) : 2.7
CO (g/kW-hr) : 4.4
HC + NOx (g/kW-hr) : 2.7
Part 60 Subpart JJJ Table 1
VOC (g/Hp-hr) : 1.0
NOx (g/Hp-hr) : 2.0
CO (g/Hp-hr) : 4.0
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60, 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60, 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60, 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60, 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60, 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. an engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ■ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, please describe: _____

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: _____

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _____

3. Engine Identification:

A. Manufacturer's Name: Taylor B. Model Number: TG100 C. Model Year: 2023

D. Facility's Identification Number or Description: Emergency Generator Engine #5 (Hot Reversing Mill) (AS-10-1) E. Serial Number: _____

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2024 B. Date Manufactured: 2023 C. Date Modified/Reconstructed: _____

D. For a used engine, approximate date engine was first placed into service at any location: _____

5. Engine Function: ☐ Compression ☑ Electrical Generation (Maximum Electrical Output): 100 kW ☐ Fire/Other Pump Driver

☐ NFPA Certified ☐ Research & Development ☐ Test Cell/Stand ☐ Other, please describe: _____

6. Engine Operation: ☑ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: _____ B. Days Per Week: _____ C. Weeks per Year: _____

D. Peak Season (if any): _____

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 160.9 B. Maximum Engine Power (kWm): 120.0 C. Maximum Heat Input (MMBtu/hr): 1.39

D. Type: ☐ Simple Cycle Turbine ☐ Combined Cycle Turbine ☐ Regenerative Cycle Turbine ☑ Reciprocating Engine

E. Piston Movement: ☐ 2-Stroke RICE ☑ 4-Stroke RICE ☐ N/A ☐ Other: _____

F. Air/Fuel Mix: ☐ Rich Burn RICE ☑ Lean Burn RICE ☐ Diffusion Flame Turbine ☐ Lean Premix Turbine ☐ Other: _____

G. Ignition Type: ☑ Spark ☐ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): 0.71

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: _____ C. Location on well? ☐ Yes ☑ No

D. Compressor Installation Date: _____ E. Compressor Serial Number: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Natural Gas	1,000	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.014	3.47E-03	N/A	N/A	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)	
NOX	0.709	0.177	N/A	N/A	NSPS Subpart JJJJ Emis. Std.	
CO	1.419	0.355	N/A	N/A	NSPS Subpart JJJJ Emis. Std.	
VOC	0.355	8.87E-02	N/A	N/A	NSPS Subpart JJJJ Emis. Std.	
SO2	8.17E-04	2.04E-04	N/A	N/A	AP-42 Tables 3.2-2, 10/24	
Formaldehyde	1.63E-01	4.07E-02	N/A	N/A	AP-42 Table 3.2-2, 10/24	
THAP	1.55E-01	3.87E-02	N/A	N/A	AP-42 Tables 3.2-2 and 1.4-4	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☑ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx	2.0	g/hp-hr	NSPS Subpart JJJJ	**2.00 g/HP-hr**
CO	4.0	g/hp-hr	NSPS Subpart JJJJ	**4.00 g/HP-hr**
VOC	1.0	g/hp-hr	NSPS Subpart JJJJ	**1.00 g/HP-hr**

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A. UTM Coordinate (E-W) (km):	428.939	B. UTM Coordinate (N-S) (km):	3424.567	C. Height above grade (ft):	5.33
D. Latitude:	30.95243	E. Longitude:	-87.74398	G. Exhaust Gas Volume (ACFM):	846
H. Inside Diameter at Exit (round) (ft):	0.33	I. Base Elevation (ft):	275	J. Exhaust Gas Temperature (°F):	1,200
K. Inside Area at Exit (not round) (sq. ft.):	0.087	L. GEP Stack Height (ft):	N/A		

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. PPSIB5.70EMT-009

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Power Solutions International, Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: PPSIB5.70EMT-009

Effective Date: 05/09/2022

Expiration Date: 12/31/2023

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 05/09/2022

Revision Date: N/A

Manufacturer: Power Solutions International, Inc.
Engine Family: PPSIB5.70EMT
Mobile/Stationary Certification Type: Stationary
Fuel : Natural Gas (CNG/LNG)
LPG/Propane
Emission Standards :
Part 60 Subpart JJJJ Table 1
VOC (g/Hp-hr) : 1.0
NOx (g/Hp-hr) : 2.0
CO (g/Hp-hr) : 4.0
Stationary Part 1048
HC + NOx (g/kW-hr) : 2.7
NMHC + NOx (g/kW-hr) : 2.7
CO (g/kW-hr) : 4.4
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. an engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ■ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, please describe: _____

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: _____

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _____

3. Engine Identification:

A. Manufacturer's Name: Taylor B. Model Number: TG150 C. Model Year: 2023

D. Facility's Identification Number or Description: Emergency Generator Engine #6 (Hot Finishing Mill) (AS-11-1) E. Serial Number: _____

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2024 B. Date Manufactured: 2023 C. Date Modified/Reconstructed: _____

D. For a used engine, approximate date engine was first placed into service at any location: _____

5. Engine Function: ☐ Compression ☑ Electrical Generation (Maximum Electrical Output): 150 kW ☐ Fire/Other Pump Driver

☐ NFPA Certified ☐ Research & Development ☐ Test Cell/Stand ☐ Other, please describe: _____

6. Engine Operation: ☑ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: _____ B. Days Per Week: _____ C. Weeks per Year: _____

D. Peak Season (if any): _____

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 261.5 B. Maximum Engine Power (kWm): 195.0 C. Maximum Heat Input (MMBtu/hr): 1.97

D. Type: ☐ Simple Cycle Turbine ☐ Combined Cycle Turbine ☐ Regenerative Cycle Turbine ☑ Reciprocating Engine

E. Piston Movement: ☐ 2-Stroke RICE ☑ 4-Stroke RICE ☐ N/A ☐ Other: _____

F. Air/Fuel Mix: ☐ Rich Burn RICE ☑ Lean Burn RICE ☐ Diffusion Flame Turbine ☐ Lean Premix Turbine ☐ Other: _____

G. Ignition Type: ☑ Spark ☐ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): 1.10

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: _____ C. Location on well? ☐ Yes ☑ No

D. Compressor Installation Date: _____ E. Compressor Serial Number: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Natural Gas	1,000	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.020	4.91E-03	N/A	N/A	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)	
NOX	1.153	0.288	N/A	N/A	NSPS Subpart JJJJ Emis. Std.	
CO	2.306	0.577	N/A	N/A	NSPS Subpart JJJJ Emis. Std.	
VOC	0.577	1.44E-01	N/A	N/A	NSPS Subpart JJJJ Emis. Std.	
SO2	1.16E-03	2.89E-04	N/A	N/A	AP-42 Tables 3.2-2, 10/24	
Formaldehyde	2.65E-01	6.62E-02	N/A	N/A	AP-42 Table 3.2-2, 10/24	
THAP	2.19E-01	5.48E-02	N/A	N/A	AP-42 Tables 3.2-2 and 1.4-4	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☑ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx	2.0	g/hp-hr	NSPS Subpart JJJJ	**2.00 g/HP-hr**
CO	4.0	g/hp-hr	NSPS Subpart JJJJ	**4.00 g/HP-hr**
VOC	1.0	g/hp-hr	NSPS Subpart JJJJ	**1.00 g/HP-hr**

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A. UTM Coordinate (E-W) (km):	429.297	B. UTM Coordinate (N-S) (km):	3424.567	C. Height above grade (ft):	6.25
D. Latitude:	30.95244	E. Longitude:	-87.74023	G. Exhaust Gas Volume (ACFM):	1,178
H. Inside Diameter at Exit (round) (ft):	0.32	I. Base Elevation (ft):	289	J. Exhaust Gas Temperature (°F):	1,200
K. Inside Area at Exit (not round) (sq. ft.):	0.082	L. GEP Stack Height (ft):	N/A		

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. PPSIB8.80EMT-014

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Power Solutions International, Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: PPSIB8.80EMT-014

Effective Date: 05/23/2022

Expiration Date: 12/31/2023

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 05/23/2022

Revision Date: N/A

Manufacturer: Power Solutions International, Inc.
Engine Family: PPSIB8.80EMT
Mobile/Stationary Certification Type: Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Emission Standards :
Part 60 Subpart JJJ Table 1
CO (g/Hp-hr) : 4.0
VOC (g/Hp-hr) : 1.0
NOx (g/Hp-hr) : 2.0
Stationary Part 1048
NMHC + NOx (g/kW-hr) : 2.7
CO (g/kW-hr) : 4.4
HC + NOx (g/kW-hr) : 2.7
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. an engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ■ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, please describe: _____

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: _____

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _____

3. Engine Identification:

A. Manufacturer's Name: Taylor B. Model Number: TG150 C. Model Year: 2023

D. Facility's Identification Number or Description: Emergency Generator Engine #7 (Cold Mill) (AS-12-1) E. Serial Number: _____

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2024 B. Date Manufactured: 2023 C. Date Modified/Reconstructed: _____

D. For a used engine, approximate date engine was first placed into service at any location: _____

5. Engine Function: ☐ Compression ☑ Electrical Generation (Maximum Electrical Output): 150 kW ☐ Fire/Other Pump Driver

☐ NFPA Certified ☐ Research & Development ☐ Test Cell/Stand ☐ Other, please describe: _____

6. Engine Operation: ☑ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: _____ B. Days Per Week: _____ C. Weeks per Year: _____

D. Peak Season (if any): _____

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 261.5 B. Maximum Engine Power (kWm): 195.0 C. Maximum Heat Input (MMBtu/hr): 1.97

D. Type: ☐ Simple Cycle Turbine ☐ Combined Cycle Turbine ☐ Regenerative Cycle Turbine ☑ Reciprocating Engine

E. Piston Movement: ☐ 2-Stroke RICE ☑ 4-Stroke RICE ☐ N/A ☐ Other: _____

F. Air/Fuel Mix: ☐ Rich Burn RICE ☑ Lean Burn RICE ☐ Diffusion Flame Turbine ☐ Lean Premix Turbine ☐ Other: _____

G. Ignition Type: ☑ Spark ☐ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): 1.10

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: _____ C. Location on well? ☐ Yes ☑ No

D. Compressor Installation Date: _____ E. Compressor Serial Number: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Natural Gas	1,000	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.020	4.91E-03	N/A	N/A	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)	
NOX	1.153	0.288	N/A	N/A	NSPS Subpart JJJJ Emis. Std.	
CO	2.306	0.577	N/A	N/A	NSPS Subpart JJJJ Emis. Std.	
VOC	0.577	1.44E-01	N/A	N/A	NSPS Subpart JJJJ Emis. Std.	
SO2	1.16E-03	2.89E-04	N/A	N/A	AP-42 Tables 3.2-2, 10/24	
Formaldehyde	2.65E-01	6.62E-02	N/A	N/A	AP-42 Table 3.2-2, 10/24	
THAP	2.19E-01	5.48E-02	N/A	N/A	AP-42 Tables 3.2-2 and 1.4-4	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☑ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx	2.0	g/hp-hr	NSPS Subpart JJJJ	**2.00 g/HP-hr**
CO	4.0	g/hp-hr	NSPS Subpart JJJJ	**4.00 g/HP-hr**
VOC	1.0	g/hp-hr	NSPS Subpart JJJJ	**1.00 g/HP-hr**

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A. UTM Coordinate (E-W) (km):	428.661	B. UTM Coordinate (N-S) (km):	3424.585	C. Height above grade (ft):	6.25
D. Latitude:	30.95257	E. Longitude:	-87.74689	G. Exhaust Gas Volume (ACFM):	1,178
H. Inside Diameter at Exit (round) (ft):	0.32	I. Base Elevation (ft):	249	J. Exhaust Gas Temperature (°F):	1,200
K. Inside Area at Exit (not round) (sq. ft.):	0.082	L. GEP Stack Height (ft):	N/A		

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. PPSIB8.80EMT-014

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Power Solutions International, Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: PPSIB8.80EMT-014

Effective Date: 05/23/2022

Expiration Date: 12/31/2023

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 05/23/2022

Revision Date: N/A

Manufacturer: Power Solutions International, Inc.
Engine Family: PPSIB8.80EMT
Mobile/Stationary Certification Type: Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Emission Standards :
Part 60 Subpart JJJ Table 1
CO (g/Hp-hr) : 4.0
VOC (g/Hp-hr) : 1.0
NOx (g/Hp-hr) : 2.0
Stationary Part 1048
NMHC + NOx (g/kW-hr) : 2.7
CO (g/kW-hr) : 4.4
HC + NOx (g/kW-hr) : 2.7
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- [■] Initial installation of a new engine (i.e. engine that has never been in service at any location)
- [ ] Initial installation of a used engine (i.e. an engine that has been in service at another location)
- [ ] Modification/Reconstruction of an engine currently installed at the facility
- [ ] Update information for an engine currently installed at the facility
- [ ] Title V Application
- [ ] Other, please describe:

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2024

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility:

3. Engine Identification:

A. Manufacturer's Name: Kohler/Rehlko B. Model Number: KG10V08T-6DGS C. Model Year: 2024

D. Facility's Identification Number or Description: Emergency Generator Engine #10 (Maintenance Bldg) (AS-29-1) E. Serial Number:

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2024 B. Date Manufactured: 2024 C. Date Modified/Reconstructed:

D. For a used engine, approximate date engine was first placed into service at any location:

5. Engine Function: [ ] Compression [☑] Electrical Generation (Maximum Electrical Output): 200 kW [ ] Fire/Other Pump Driver [ ] NFPA Certified [ ] Research & Development [ ] Test Cell/Stand [ ] Other, please describe:

6. Engine Operation: [☑] Emergency Only [ ] Non-emergency, please provide typical operating schedule in Items A-D below: [ ] Limited Use (<100 hr/yr) A. Hours Per Day: B. Days Per Week: C. Weeks per Year: D. Peak Season (if any):

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 304 B. Maximum Engine Power (kWm): 226.7 C. Maximum Heat Input (MMBtu/hr): 2.40

D. Type: [ ] Simple Cycle Turbine [ ] Combined Cycle Turbine [ ] Regenerative Cycle Turbine [☑] Reciprocating Engine

E. Piston Movement: [ ] 2-Stroke RICE [☑] 4-Stroke RICE [ ] N/A [ ] Other:

F. Air/Fuel Mix: [ ] Rich Burn RICE [☑] Lean Burn RICE [ ] Diffusion Flame Turbine [ ] Lean Premix Turbine [ ] Other:

G. Ignition Type: [☑] Spark [ ] Compression [ ] N/A H. Cylinder Displacement (Liters per cylinder): 1.29

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: C. Location on well? [ ] Yes [☑] No

D. Compressor Installation Date: E. Compressor Serial Number: F. Compressor Brake Horsepower (bhp):

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Natural Gas	1,000	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.024	5.99E-03	N/A	N/A	AP-42 Table 3.2-2, 10/24 (filterable PM + condensable PM)	
NOX	0.100	0.025	N/A	N/A	Vendor estimate	
CO	0.200	0.050	N/A	N/A	Vendor estimate	
VOC	0.015	3.75E-03	N/A	N/A	Vendor estimate	
SO2	1.41E-03	3.53E-04	N/A	N/A	AP-42 Tables 3.2-2, 10/24	
Formaldehyde	6.88E-03	1.72E-03	N/A	N/A	AP-42 Table 3.2-2, 10/24	
THAP	2.68E-01	6.69E-02	N/A	N/A	AP-42 Tables 3.2-2 and 1.4-4	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☑ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx	2.0	g/hp-hr	NSPS Subpart JJJJ	0.15 g/HP-hr
CO	4.0	g/hp-hr	NSPS Subpart JJJJ	0.30 g/HP-hr
VOC	1.0	g/hp-hr	NSPS Subpart JJJJ	0.02 g/HP-hr

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A. UTM Coordinate (E-W) (km): 428.804 B. UTM Coordinate (N-S) (km): 3424.325 C. Height above grade (ft): 6.39

D. Latitude: 30.95023 E. Longitude: -87.74531 G. Exhaust Gas Volume (ACFM): 1,469

H. Inside Diameter at Exit (round) (ft): 0.42 I. Base Elevation (ft): 251 J. Exhaust Gas Temperature (°F): 1,407

K. Inside Area at Exit (not round) (sq. ft.): 0.139 L. GEP Stack Height (ft): N/A

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. RKHXB10.3TNL-008

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

KOHLER®

KG200

60 Hz. Gas Generator Set
EPA Certified for Stationary Emergency Applications
EMISSION DATA SHEET

ENGINE INFORMATION

Model:	KG10V08T-6DGS	Bore:	116.8mm (4.6 in.)
Max kW @ 1800 RPM:	227 (NG) 178 (LPG)	Stroke:	120.6mm (4.7 in.)
Type:	4-Cycle,V8 Cylinder	Displacement:	10.3 L (632 cu. in.)
Aspiration:	Turbocharged	EPA Family:	RKHXB10.3TNL
Compression Ratio:	9.3:1	EPA Certificate:	RKHXB10.3TNL-008
Catalyst Required:	Yes		

EXHAUST EMISSION DATA[1] (g/kW-hr):

	LPG	NG
CO_2	833	600
NOx	0.15	0.20
THC/VOC[2]	0.03	0.03
CO	0.54	0.40
BSFC	294	219

1) Emissions shown are certified third-party zero-hour data points suitable for site permitting calculations

2) LPG as THC, NG as VOC

TEST METHODS AND CONDITIONS

Standby and overload ratings based on ISO 3046. Continuous ratings based on ISO 8528.
Max power rating is measured at the flywheel operating at standard conditions in a test cell.
Production tolerances in engines and installed components can account for power variations of +/- 5%. Corrections for altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

Electrical ratings are an estimate based on assumed fan and generator losses and may vary depending on actual equipment losses.
Emission rates are based on multi-mode, cycle-weighted testing in accordance with EPA regulations.
BSFC is based on cycle-weighted gross flywheel power rating and does not include fan or generator losses.

Data was taken from a single engine test according to EPA engine test methods, fuel specifications and reference conditions and is subject to instrumentation and engine-to-engine variability. Tests conducted with alternate test methods, instrumentation, fuel or reference conditions may yield different results.

Data and specifications subject to change without notice.

BOM-SUP-CAT-001 MAINTENANCE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2024 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Kohler Co. (U.S. Manufacturer or Importer) **Certificate Number: RKHXB10.3TNL-008**	**Effective Date:** 12/01/2023 **Expiration Date:** 12/31/2024	Byron J. Bunker, Division Director Compliance Division	**Issue Date:** 12/01/2023 **Revision Date:** N/A

Manufacturer: Kohler Co.
Engine Family: RKHXB10.3TNL
Mobile/Stationary Certification Type: Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Emission Standards :
Stationary Part 1048
NMHC + NOx (g/kW-hr) : 2.7
CO (g/kW-hr) : 4.4
HC + NOx (g/kW-hr) : 2.7
Part 60 Subpart JJJ Table 1
VOC (g/Hp-hr) : 1.0
NOx (g/Hp-hr) : 2.0
CO (g/Hp-hr) : 4.0
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60, 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60, 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60, 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60, 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60, 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- [■] Initial installation of a new engine (i.e. engine that has never been in service at any location)
- [ ] Initial installation of a used engine (i.e. an engine that has been in service at another location)
- [ ] Modification/Reconstruction of an engine currently installed at the facility
- [ ] Update information for an engine currently installed at the facility
- [ ] Title V Application
- [ ] Other, please describe:

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2024

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility:

3. Engine Identification:

A. Manufacturer's Name: Kohler/Rehlko B. Model Number: KG2204T C. Model Year: 2025

D. Facility's Identification Number or Description: Emergency Generator Engine #11 (Decoater #1) (AS-30-1) E. Serial Number:

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2024 B. Date Manufactured: 2025 C. Date Modified/Reconstructed:

D. For a used engine, approximate date engine was first placed into service at any location:

5. Engine Function: [ ] Compression [☑] Electrical Generation (Maximum Electrical Output): 30 kW [ ] Fire/Other Pump Driver [ ] NFPA Certified [ ] Research & Development [ ] Test Cell/Stand [ ] Other, please describe:

6. Engine Operation: [☑] Emergency Only [ ] Non-emergency, please provide typical operating schedule in Items A-D below: [ ] Limited Use (<100 hr/yr) A. Hours Per Day: B. Days Per Week: C. Weeks per Year:

D. Peak Season (if any):

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 63.9 B. Maximum Engine Power (kWm): 47.7 C. Maximum Heat Input (MMBtu/hr): 0.42

D. Type: [ ] Simple Cycle Turbine [ ] Combined Cycle Turbine [ ] Regenerative Cycle Turbine [☑] Reciprocating Engine

E. Piston Movement: [ ] 2-Stroke RICE [☑] 4-Stroke RICE [ ] N/A [ ] Other:

F. Air/Fuel Mix: [☑] Rich Burn RICE [ ] Lean Burn RICE [ ] Diffusion Flame Turbine [ ] Lean Premix Turbine [ ] Other:

G. Ignition Type: [☑] Spark [ ] Compression [ ] N/A H. Cylinder Displacement (Liters per cylinder): 0.55

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: C. Location on well? [ ] Yes [☑] No

D. Compressor Installation Date: E. Compressor Serial Number: F. Compressor Brake Horsepower (bhp):

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Natural Gas	1,000	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.008	2.06E-03	N/A	N/A	AP-42 Table 3.2-3, 10/24 (filterable PM + condensable PM)	
NOX	0.242	0.060	N/A	N/A	Vendor estimate	
CO	10.295	2.574	N/A	N/A	Vendor estimate	
VOC	0.084	2.10E-02	N/A	N/A	Vendor estimate	
SO2	2.49E-04	6.23E-05	N/A	N/A	AP-42 Tables 3.2-3, 10/24	
Formaldehyde	2.99E-02	7.48E-03	N/A	N/A	AP-42 Table 3.2-3, 07/2000	
THAP	4.73E-02	1.18E-02	N/A	N/A	AP-42 Tables 3.2-3 and 1.4-4	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☑ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx	10.0	g/hp-hr	NSPS Subpart JJJJ	1.72 g/HP-hr
CO	387.0	g/hp-hr	NSPS Subpart JJJJ	73.08 g/HP-hr

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A.UTM Coordinate (E-W) (km): N/A B.UTM Coordinate (N-S) (km): N/A C.Height above grade (ft): N/A

D. Latitude: N/A E. Longitude: N/A G. Exhaust Gas Volume (ACFM): N/A

H. Inside Diameter at Exit (round) (ft): N/A I. Base Elevation (ft): N/A J. Exhaust Gas Temperature (°F): N/A

K. Inside Area at Exit (not round) (sq. ft.): N/A L. GEP Stack Height (ft): N/A

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. SKHXB02.2TNL-003

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

rehlko

30RCLA/38RCLC

60 Hz. Gas Generator Set
EPA Certified for Stationary Emergency Applications
EMISSION DATA SHEET

ENGINE INFORMATION

Model:	KG2204T	Bore:	91mm (3.5 in.)
Nameplate kW @ 1800 RPM:	50 (NG) 54 (LPG)	Stroke:	86mm (3.4 in.)
Type:	4-Cycle,4 Cylinder In Line	Displacement:	2.2 L (134 cu. in.)
Aspiration:	Turbocharged	EPA Family:	SKHXB02.2TNL
Compression Ratio:	10.5:1	EPA Certificate:	SKHXB02.2TNL-003
Catalyst Required:	No		

EXHAUST EMISSION DATA (g/kW-hr):

	LPG	NG
CO_2	624	624
NOx	2.6	2.3
THC+NOx*	4.8	3.1
CO	162	98
BSFC	294	293

*NG fuel is NMHC+NOx

TEST METHODS AND CONDITIONS

Standby and overload ratings based on ISO 3046. Continuous ratings based on ISO 8528.
Nameplate power rating is measured at the flywheel operating at standard conditions in a test cell.
Production tolerances in engines and installed components can account for power variations of +/- 5%. Corrections for altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

Electrical ratings are an estimate based on assumed fan and generator losses and may vary depending on actual equipment losses.
Emission rates are based on multi-mode, cycle-weighted testing in accordance with EPA regulations.
BSFC is based on cycle-weighted gross flywheel power rating and does not include fan or generator losses.

Data was taken from a single engine test according to EPA engine test methods, fuel specifications and reference conditions and is subject to instrumentation and engine-to-engine variability. Tests conducted with alternate test methods, instrumentation, fuel or reference conditions may yield different results.

Data and specifications subject to change without notice.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2025 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Discovery Energy, LLC.**
(U.S. Manufacturer or Importer)

Certificate Number: SKHXB02.2TNL-003

Effective Date: 12/13/2024

Expiration Date: 12/31/2025

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 12/13/2024

Revision Date: N/A

Manufacturer: Discovery Energy, LLC.
Engine Family: SKHXB02.2TNL
Mobile/Stationary Certification Type: Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Emission Standards :
Part 1054 Phase 1 Class II

Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- [■] Initial installation of a new engine (i.e. engine that has never been in service at any location)
- [ ] Initial installation of a used engine (i.e. an engine that has been in service at another location)
- [ ] Modification/Reconstruction of an engine currently installed at the facility
- [ ] Update information for an engine currently installed at the facility
- [ ] Title V Application
- [ ] Other, please describe:

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2024

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility:

3. Engine Identification:

A. Manufacturer's Name: Kohler/Rehlko B. Model Number: KG2204T C. Model Year: 2025

D. Facility's Identification Number or Description: Emergency Generator Engine #12 (Decoater #2) (AS-31-1) E. Serial Number:

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2024 B. Date Manufactured: 2025 C. Date Modified/Reconstructed:

D. For a used engine, approximate date engine was first placed into service at any location:

5. Engine Function: [ ] Compression [x] Electrical Generation (Maximum Electrical Output): 30 kW [ ] Fire/Other Pump Driver [ ] NFPA Certified [ ] Research & Development [ ] Test Cell/Stand [ ] Other, please describe:

6. Engine Operation: [x] Emergency Only [ ] Non-emergency, please provide typical operating schedule in Items A-D below: [ ] Limited Use (<100 hr/yr) A. Hours Per Day: B. Days Per Week: C. Weeks per Year: D. Peak Season (if any):

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 63.9 B. Maximum Engine Power (kWm): 47.7 C. Maximum Heat Input (MMBtu/hr): 0.42

D. Type: [ ] Simple Cycle Turbine [ ] Combined Cycle Turbine [ ] Regenerative Cycle Turbine [x] Reciprocating Engine

E. Piston Movement: [ ] 2-Stroke RICE [x] 4-Stroke RICE [ ] N/A [ ] Other:

F. Air/Fuel Mix: [x] Rich Burn RICE [ ] Lean Burn RICE [ ] Diffusion Flame Turbine [ ] Lean Premix Turbine [ ] Other:

G. Ignition Type: [x] Spark [ ] Compression [ ] N/A H. Cylinder Displacement (Liters per cylinder): 0.55

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: C. Location on well? [ ] Yes [x] No

D. Compressor Installation Date: E. Compressor Serial Number: F. Compressor Brake Horsepower (bhp):

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Natural Gas	1,000	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.008	2.06E-03	N/A	N/A	AP-42 Table 3.2-3, 10/24 (filterable PM + condensable PM)	
NOX	0.242	0.060	N/A	N/A	Vendor estimate	
CO	10.295	2.574	N/A	N/A	Vendor estimate	
VOC	0.084	2.10E-02	N/A	N/A	Vendor estimate	
SO2	2.49E-04	6.23E-05	N/A	N/A	AP-42 Tables 3.2-3, 10/24	
Formaldehyde	2.99E-02	7.48E-03	N/A	N/A	AP-42 Table 3.2-3, 07/2000	
THAP	4.73E-02	1.18E-02	N/A	N/A	AP-42 Tables 3.2-3 and 1.4-4	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☑ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx	10.0	g/hp-hr	NSPS Subpart JJJJ	1.72 g/HP-hr
CO	387.0	g/hp-hr	NSPS Subpart JJJJ	73.08 g/HP-hr

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A.UTM Coordinate (E-W) (km): N/A B.UTM Coordinate (N-S) (km): N/A C.Height above grade (ft): N/A

D. Latitude: N/A E. Longitude: N/A G. Exhaust Gas Volume (ACFM): N/A

H. Inside Diameter at Exit (round) (ft): N/A I. Base Elevation (ft): N/A J. Exhaust Gas Temperature (°F): N/A

K. Inside Area at Exit (not round) (sq. ft.): N/A L. GEP Stack Height (ft): N/A

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. SKHXB02.2TNL-003

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

rehlko

30RCLA/38RCLC

60 Hz. Gas Generator Set
EPA Certified for Stationary Emergency Applications
EMISSION DATA SHEET

ENGINE INFORMATION

Model:	KG2204T	Bore:	91mm (3.5 in.)
Nameplate kW @ 1800 RPM:	50 (NG) 54 (LPG)	Stroke:	86mm (3.4 in.)
Type:	4-Cycle,4 Cylinder In Line	Displacement:	2.2 L (134 cu. in.)
Aspiration:	Turbocharged	EPA Family:	SKHXB02.2TNL
Compression Ratio:	10.5:1	EPA Certificate:	SKHXB02.2TNL-003
Catalyst Required:	No		

EXHAUST EMISSION DATA (g/kW-hr):

	LPG	NG
CO_2	624	624
NOx	2.6	2.3
THC+NOx*	4.8	3.1
CO	162	98
BSFC	294	293

*NG fuel is NMHC+NOx

TEST METHODS AND CONDITIONS

Standby and overload ratings based on ISO 3046. Continuous ratings based on ISO 8528.
Nameplate power rating is measured at the flywheel operating at standard conditions in a test cell.
Production tolerances in engines and installed components can account for power variations of +/- 5%. Corrections for altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

Electrical ratings are an estimate based on assumed fan and generator losses and may vary depending on actual equipment losses.
Emission rates are based on multi-mode, cycle-weighted testing in accordance with EPA regulations.
BSFC is based on cycle-weighted gross flywheel power rating and does not include fan or generator losses.

Data was taken from a single engine test according to EPA engine test methods, fuel specifications and reference conditions and is subject to instrumentation and engine-to-engine variability. Tests conducted with alternate test methods, instrumentation, fuel or reference conditions may yield different results.

Data and specifications subject to change without notice.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2025 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Discovery Energy, LLC.**
(U.S. Manufacturer or Importer)

Certificate Number: SKHXB02.2TNL-003

Effective Date: 12/13/2024

Expiration Date: 12/31/2025

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 12/13/2024

Revision Date: N/A

Manufacturer: Discovery Energy, LLC.
Engine Family: SKHXB02.2TNL
Mobile/Stationary Certification Type: Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Emission Standards :
Part 1054 Phase 1 Class II

Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

____ – ____ – ____

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- [■] Initial installation of a new engine (i.e. engine that has never been in service at any location)
- [ ] Initial installation of a used engine (i.e. an engine that has been in service at another location)
- [ ] Modification/Reconstruction of an engine currently installed at the facility
- [ ] Update information for an engine currently installed at the facility
- [ ] Title V Application
- [ ] Other, please describe: _____

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2024

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _____

3. Engine Identification:

A. Manufacturer's Name: Kohler/Rehlko B. Model Number: KG2204T C. Model Year: 2025

D. Facility's Identification Number or Description: Emergency Generator Engine #13 (Decoater #3) (AS-32-1) E. Serial Number: _____

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2024 B. Date Manufactured: 2025 C. Date Modified/Reconstructed: _____

D. For a used engine, approximate date engine was first placed into service at any location: _____

5. Engine Function: [ ] Compression [☑] Electrical Generation (Maximum Electrical Output): 30 kW [ ] Fire/Other Pump Driver

[ ] NFPA Certified [ ] Research & Development [ ] Test Cell/Stand [ ] Other, please describe: _____

6. Engine Operation: [☑] Emergency Only [ ] Non-emergency, please provide typical operating schedule in Items A-D below:

[ ] Limited Use (<100 hr/yr) A. Hours Per Day: _____ B. Days Per Week: _____ C. Weeks per Year: _____

D. Peak Season (if any): _____

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 63.9 B. Maximum Engine Power (kWm): 47.7 C. Maximum Heat Input (MMBtu/hr): 0.42

D. Type: [ ] Simple Cycle Turbine [ ] Combined Cycle Turbine [ ] Regenerative Cycle Turbine [☑] Reciprocating Engine

E. Piston Movement: [ ] 2-Stroke RICE [☑] 4-Stroke RICE [ ] N/A [ ] Other: _____

F. Air/Fuel Mix: [☑] Rich Burn RICE [ ] Lean Burn RICE [ ] Diffusion Flame Turbine [ ] Lean Premix Turbine [ ] Other: _____

G. Ignition Type: [☑] Spark [ ] Compression [ ] N/A H. Cylinder Displacement (Liters per cylinder): 0.55

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: _____ C. Location on well? [ ] Yes [☑] No

D. Compressor Installation Date: _____ E. Compressor Serial Number: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Natural Gas	1,000	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.008	2.06E-03	N/A	N/A	AP-42 Table 3.2-3, 10/24 (filterable PM + condensable PM)	
NOX	0.242	0.060	N/A	N/A	Vendor estimate	
CO	10.295	2.574	N/A	N/A	Vendor estimate	
VOC	0.084	2.10E-02	N/A	N/A	Vendor estimate	
SO2	2.49E-04	6.23E-05	N/A	N/A	AP-42 Tables 3.2-3, 10/24	
Formaldehyde	2.99E-02	7.48E-03	N/A	N/A	AP-42 Table 3.2-3, 07/2000	
THAP	4.73E-02	1.18E-02	N/A	N/A	AP-42 Tables 3.2-3 and 1.4-4	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☑ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx	10.0	g/hp-hr	NSPS Subpart JJJJ	1.72 g/HP-hr
CO	387.0	g/hp-hr	NSPS Subpart JJJJ	73.08 g/HP-hr

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A.UTM Coordinate (E-W) (km): N/A B.UTM Coordinate (N-S) (km): N/A C.Height above grade (ft): N/A

D. Latitude: N/A E. Longitude: N/A G. Exhaust Gas Volume (ACFM): N/A

H. Inside Diameter at Exit (round) (ft): N/A I. Base Elevation (ft): N/A J. Exhaust Gas Temperature (°F): N/A

K. Inside Area at Exit (not round) (sq. ft.): N/A L. GEP Stack Height (ft): N/A

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. SKHXB02.2TNL-003

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

rehlko

30RCLA/38RCLC

60 Hz. Gas Generator Set
EPA Certified for Stationary Emergency Applications
EMISSION DATA SHEET

ENGINE INFORMATION

Model:	KG2204T	Bore:	91mm (3.5 in.)
Nameplate kW @ 1800 RPM:	50 (NG) 54 (LPG)	Stroke:	86mm (3.4 in.)
Type:	4-Cycle,4 Cylinder In Line	Displacement:	2.2 L (134 cu. in.)
Aspiration:	Turbocharged	EPA Family:	SKHXB02.2TNL
Compression Ratio:	10.5:1	EPA Certificate:	SKHXB02.2TNL-003
Catalyst Required:	No		

EXHAUST EMISSION DATA (g/kW-hr):

	LPG	NG
CO_2	624	624
NOx	2.6	2.3
THC+NOx*	4.8	3.1
CO	162	98
BSFC	294	293

*NG fuel is NMHC+NOx

TEST METHODS AND CONDITIONS

Standby and overload ratings based on ISO 3046. Continuous ratings based on ISO 8528.
Nameplate power rating is measured at the flywheel operating at standard conditions in a test cell.
Production tolerances in engines and installed components can account for power variations of +/- 5%. Corrections for altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

Electrical ratings are an estimate based on assumed fan and generator losses and may vary depending on actual equipment losses.
Emission rates are based on multi-mode, cycle-weighted testing in accordance with EPA regulations.
BSFC is based on cycle-weighted gross flywheel power rating and does not include fan or generator losses.

Data was taken from a single engine test according to EPA engine test methods, fuel specifications and reference conditions and is subject to instrumentation and engine-to-engine variability. Tests conducted with alternate test methods, instrumentation, fuel or reference conditions may yield different results.

Data and specifications subject to change without notice.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2025 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Discovery Energy, LLC.**
(U.S. Manufacturer or Importer)

Certificate Number: SKHXB02.2TNL-003

Effective Date: 12/13/2024

Expiration Date: 12/31/2025

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 12/13/2024

Revision Date: N/A

Manufacturer: Discovery Energy, LLC.
Engine Family: SKHXB02.2TNL
Mobile/Stationary Certification Type: Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Emission Standards :
Part 1054 Phase 1 Class II

Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. an engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ■ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, please describe:

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: _____

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _____

3. Engine Identification:

A. Manufacturer's Name: Clarke B. Model Number: C18H0-UFAD70 C. Model Year: 2025

D. Facility's Identification Number or Description: Fire Pump Engine #1 (North Pump House) (AS-15-1) E. Serial Number: _____

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2022 B. Date Manufactured: 2023 C. Date Modified/Reconstructed: _____

D. For a used engine, approximate date engine was first placed into service at any location: _____

5. Engine Function: ☐ Compression ☐ Electrical Generation (Maximum Electrical Output): _____ ☑ Fire/Other Pump Driver

☐ NFPA Certified ☐ Research & Development ☐ Test Cell/Stand ☐ Other, please describe: _____

6. Engine Operation: ☑ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: _____ B. Days Per Week: _____ C. Weeks per Year: _____

D. Peak Season (if any): _____

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 700 B. Maximum Engine Power (kWm): 522.0 C. Maximum Heat Input (MMBtu/hr): 5.26

D. Type: ☐ Simple Cycle Turbine ☐ Combined Cycle Turbine ☐ Regenerative Cycle Turbine ☑ Reciprocating Engine

E. Piston Movement: ☐ 2-Stroke RICE ☑ 4-Stroke RICE ☐ N/A ☐ Other: _____

F. Air/Fuel Mix: ☑ Rich Burn RICE ☐ Lean Burn RICE ☐ Diffusion Flame Turbine ☐ Lean Premix Turbine ☐ Other: _____

G. Ignition Type: ☑ Spark ☐ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): 3.02

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: _____ C. Location on well? ☐ Yes ☑ No

D. Compressor Installation Date: _____ E. Compressor Serial Number: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Diesel	138,500	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.125	3.13E-02	N/A	N/A	Vendor estimate	
NOX	4.136	1.034	N/A	N/A	Vendor estimate	
CO	0.617	0.154	N/A	N/A	Vendor estimate	
VOC	0.108	2.70E-02	N/A	N/A	Vendor estimate	
SO2	7.97E-03	1.99E-03	N/A	N/A	AP-42 Table 3.4-1	
Formaldehyde	6.21E-03	1.55E-03	N/A	N/A	AP-42 Table 3.3-2, 4/2025	
THAP	2.10E-02	5.25E-03	N/A	N/A	AP-42 Tables 3.3-2 & 1.3-10	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☑ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NMHC + NOx	3.0	g/hp-hr	NSPS Subpart IIII	**2.68 g/HP-hr**
CO	2.6	g/hp-hr	NSPS Subpart IIII	**0.40 g/HP-hr**
Filterable PM	0.15	g/hp-hr	NSPS Subpart IIII	**0.081 g/HP-hr**

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A. UTM Coordinate (E-W) (km):	428.826	B. UTM Coordinate (N-S) (km):	3424.589	C. Height above grade (ft):	15.78
D. Latitude:	30.95262	E. Longitude:	-87.74516	G. Exhaust Gas Volume (ACFM):	4,258
H. Inside Diameter at Exit (round) (ft):	0.67	I. Base Elevation (ft):	256	J. Exhaust Gas Temperature (°F):	950
K. Inside Area at Exit (not round) (sq. ft.):	0.349	L. GEP Stack Height (ft):	N/A		

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. SCPXL18.1NZS-027

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

Clarke Model		C18H0-UFAD70		
Derived Rating	--	kW	--	hp
Rated Speed	--	rpm	--	rpm
NOx	--	g/kW-hr	--	g/hp-hr
HC	--	g/kW-hr	--	g/hp-hr
PM	--	g/kW-hr	--	g/hp-hr
CO	--	g/kW-hr	--	g/hp-hr
Certified Rating	522 kW		700 hp	
Rated Speed	1900 rpm		1900 rpm	
NOx	3.59 g/kW-hr		2.68 g/hp-hr	
HC	0.09 g/kW-hr		0.07 g/hp-hr	
PM	0.108 g/kW-hr		0.081 g/hp-hr	
CO	0.53 g/kW-hr		0.40 g/hp-hr	

-Applicable to Cat C18 800hp Tier 2, 700hp Tier 3 & 600hp Tier 3 firepump driver engines.

-PQ3058, PQ3057 & PQ3056 respectively

-800hp, 700hp and 600hp nameplate ratings have been certified according to EPA requirements for firepump driver engines at the stated speeds.

-Subsequent derivative rating cycle emissions have been calculated based on the available emissions data for the base rating, as depicted in the above tables. Emissions cycle requirements are only mandated for the base ratings.

-This information is the property of Caterpillar Inc. Unauthorized distribution of this information is prohibited.

Caterpillar: Confidential Green

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. an engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ■ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, please describe: _____

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: _____

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _____

3. Engine Identification:

A. Manufacturer's Name: Clarke B. Model Number: C18H0-UFAD28 C. Model Year: 2025

D. Facility's Identification Number or Description: Fire Pump Engine #3 (West Pump House) (AS-17-1) E. Serial Number: _____

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2022 B. Date Manufactured: 2023 C. Date Modified/Reconstructed: _____

D. For a used engine, approximate date engine was first placed into service at any location: _____

5. Engine Function: ☐ Compression ☐ Electrical Generation (Maximum Electrical Output): _____ ☑ Fire/Other Pump Driver

☐ NFPA Certified ☐ Research & Development ☐ Test Cell/Stand ☐ Other, please describe: _____

6. Engine Operation: ☑ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: _____ B. Days Per Week: _____ C. Weeks per Year: _____

D. Peak Season (if any): _____

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 510 B. Maximum Engine Power (kWm): 380.3 C. Maximum Heat Input (MMBtu/hr): 4.57

D. Type: ☐ Simple Cycle Turbine ☐ Combined Cycle Turbine ☐ Regenerative Cycle Turbine ☑ Reciprocating Engine

E. Piston Movement: ☐ 2-Stroke RICE ☑ 4-Stroke RICE ☐ N/A ☐ Other: _____

F. Air/Fuel Mix: ☑ Rich Burn RICE ☐ Lean Burn RICE ☐ Diffusion Flame Turbine ☐ Lean Premix Turbine ☐ Other: _____

G. Ignition Type: ☑ Spark ☐ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): 3.02

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: _____ C. Location on well? ☐ Yes ☑ No

D. Compressor Installation Date: _____ E. Compressor Serial Number: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Diesel	138,500	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.075	1.88E-02	N/A	N/A	Vendor estimate	
NOX	2.923	0.731	N/A	N/A	Vendor estimate	
CO	0.382	0.096	N/A	N/A	Vendor estimate	
VOC	0.079	1.97E-02	N/A	N/A	Vendor estimate	
SO2	6.92E-03	1.73E-03	N/A	N/A	AP-42 Table 3.4-1	
Formaldehyde	5.39E-03	1.35E-03	N/A	N/A	AP-42 Table 3.3-2, 4/2025	
THAP	1.83E-02	4.56E-03	N/A	N/A	AP-42 Tables 3.3-2 & 1.3-10	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☑ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NMHC + NOx	3.0	g/hp-hr	NSPS Subpart IIII	**2.60 g/HP-hr**
CO	2.6	g/hp-hr	NSPS Subpart IIII	**0.34 g/HP-hr**
Filterable PM	0.15	g/hp-hr	NSPS Subpart IIII	**0.067 g/HP-hr**

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A. UTM Coordinate (E-W) (km):	428.159	B. UTM Coordinate (N-S) (km):	3424.135	C. Height above grade (ft):	16.42
D. Latitude:	30.94849	E. Longitude:	-87.75212	G. Exhaust Gas Volume (ACFM):	3,341
H. Inside Diameter at Exit (round) (ft):	0.67	I. Base Elevation (ft):	245	J. Exhaust Gas Temperature (°F):	924
K. Inside Area at Exit (not round) (sq. ft.):	0.35	L. GEP Stack Height (ft):	N/A		

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. SCPXL18.1NZS-027

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

Clarke Model	C18H0-UFAD28	
Derived Rating	381 kW	510 hp
Rated Speed	1760 rpm	1760 rpm
NOx	3.43 g/kW-hr	2.56 g/hp-hr
HC	0.12 g/kW-hr	0.09 g/hp-hr
PM	0.099 g/kW-hr	0.074 g/hp-hr
CO	0.48 g/kW-hr	0.36 g/hp-hr
Certified Rating	448 kW	600 hp
Rated Speed	1760 rpm	1760 rpm
NOx	3.48 g/kW-hr	2.60 g/hp-hr
HC	0.1 g/kW-hr	0.07 g/hp-hr
PM	0.09 g/kW-hr	0.067 g/hp-hr
CO	0.46 g/kW-hr	0.34 g/hp-hr

-Applicable to Cat C18 800hp Tier 2, 700hp Tier 3 & 600hp Tier 3 firepump driver engines.

-PQ3058, PQ3057 & PQ3056 respectively

-800hp, 700hp and 600hp nameplate ratings have been certified according to EPA requirements for firepump driver engines at the stated speeds.

-Subsequent derivative rating cycle emissions have been calculated based on the available emissions data for the base rating, as depicted in the above tables. Emissions cycle requirements are only mandated for the base ratings.

-This information is the property of Caterpillar Inc. Unauthorized distribution of this information is prohibited.

Caterpillar: Confidential Green

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

Permit Number (ADEM Use Only)

1. Facility or Organization Name: Novelis Corp. - Bay Minette Facility **Location:** Bay Minette, AL

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. an engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ■ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, please describe:

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: _____

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _____

3. Engine Identification:

A. Manufacturer's Name: Clarke B. Model Number: C18H0-UFAD28 C. Model Year: 2025

D. Facility's Identification Number or Description: Fire Pump Engine #4 (West Pump House) (AS-18-1) E. Serial Number: _____

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2022 B. Date Manufactured: 2023 C. Date Modified/Reconstructed: _____

D. For a used engine, approximate date engine was first placed into service at any location: _____

5. Engine Function: ☐ Compression ☐ Electrical Generation (Maximum Electrical Output): _____ ☑ Fire/Other Pump Driver

☐ NFPA Certified ☐ Research & Development ☐ Test Cell/Stand ☐ Other, please describe: _____

6. Engine Operation: ☑ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: _____ B. Days Per Week: _____ C. Weeks per Year: _____

D. Peak Season (if any): _____

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 510 B. Maximum Engine Power (kWm): 380.3 C. Maximum Heat Input (MMBtu/hr): 4.57

D. Type: ☐ Simple Cycle Turbine ☐ Combined Cycle Turbine ☐ Regenerative Cycle Turbine ☑ Reciprocating Engine

E. Piston Movement: ☐ 2-Stroke RICE ☑ 4-Stroke RICE ☐ N/A ☐ Other: _____

F. Air/Fuel Mix: ☑ Rich Burn RICE ☐ Lean Burn RICE ☐ Diffusion Flame Turbine ☐ Lean Premix Turbine ☐ Other: _____

G. Ignition Type: ☑ Spark ☐ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): 3.02

8. Compressor Specifications:

A. Compressor Type: N/A B. Compressor Mfg. Date: _____ C. Location on well? ☐ Yes ☑ No

D. Compressor Installation Date: _____ E. Compressor Serial Number: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Diesel	138,500	N/A	N/A	N/A	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
PM	0.075	1.88E-02	N/A	N/A	Vendor estimate	
NOX	2.923	0.731	N/A	N/A	Vendor estimate	
CO	0.382	0.096	N/A	N/A	Vendor estimate	
VOC	0.079	1.97E-02	N/A	N/A	Vendor estimate	
SO2	6.92E-03	1.73E-03	N/A	N/A	AP-42 Table 3.4-1	
Formaldehyde	5.39E-03	1.35E-03	N/A	N/A	AP-42 Table 3.3-2, 4/2025	
THAP	1.83E-02	4.56E-03	N/A	N/A	AP-42 Tables 3.3-2 & 1.3-10	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☑ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NMHC + NOx	3.0	g/hp-hr	NSPS Subpart IIII	**2.60 g/HP-hr**
CO	2.6	g/hp-hr	NSPS Subpart IIII	**0.34 g/HP-hr**
Filterable PM	0.15	g/hp-hr	NSPS Subpart IIII	**0.067 g/HP-hr**

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? N/A ☐ No ☐ Yes ☑ (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? N/A ☐ No ☐ Yes ☑

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NOx Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

N/A

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? Yes [x] No [ ] (If "No", must attach ADEM Form 437)

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A. UTM Coordinate (E-W) (km):	428.153	B. UTM Coordinate (N-S) (km):	3424.135	C. Height above grade (ft):	16.42
D. Latitude:	30.94848	E. Longitude:	-87.75218	G. Exhaust Gas Volume (ACFM):	3,341
H. Inside Diameter at Exit (round) (ft):	0.67	I. Base Elevation (ft):	245	J. Exhaust Gas Temperature (°F):	924
K. Inside Area at Exit (not round) (sq. ft.):	0.35	L. GEP Stack Height (ft):	N/A		

M. Are sampling ports available? Yes [ ] No [x]

16. Clarifying/Supplemental Information (Optional):

EPA Certification No. SCPXL18.1NZS-027

Please provide the following for the person preparing this application:

Name (Print or Type): John Colebrook Company/Affiliation: Trinity Consultants

Signature: John Colebrook Date: 11/25/2025

Clarke Model	C18H0-UFAD28	
Derived Rating	381 kW	510 hp
Rated Speed	1760 rpm	1760 rpm
NOx	3.43 g/kW-hr	2.56 g/hp-hr
HC	0.12 g/kW-hr	0.09 g/hp-hr
PM	0.099 g/kW-hr	0.074 g/hp-hr
CO	0.48 g/kW-hr	0.36 g/hp-hr
Certified Rating	448 kW	600 hp
Rated Speed	1760 rpm	1760 rpm
NOx	3.48 g/kW-hr	2.60 g/hp-hr
HC	0.1 g/kW-hr	0.07 g/hp-hr
PM	0.09 g/kW-hr	0.067 g/hp-hr
CO	0.46 g/kW-hr	0.34 g/hp-hr

-Applicable to Cat C18 800hp Tier 2, 700hp Tier 3 & 600hp Tier 3 firepump driver engines.

-PQ3058, PQ3057 & PQ3056 respectively

-800hp, 700hp and 600hp nameplate ratings have been certified according to EPA requirements for firepump driver engines at the stated speeds.

-Subsequent derivative rating cycle emissions have been calculated based on the available emissions data for the base rating, as depicted in the above tables. Emissions cycle requirements are only mandated for the base ratings.

-This information is the property of Caterpillar Inc. Unauthorized distribution of this information is prohibited.

Caterpillar: Confidential Green

Novelis Corp. - Bay Minette Facility

ADEM 109 Forms - Surface Coating Lines

PERMIT APPLICATION FOR VOLATILE ORGANIC COMPOUND (VOC) SURFACE COATING EMISSION SOURCES

Do not write in this space

1. **Name of firm or organization:** Novelis Corp. - Bay Minette Facility

2. **Identification Name or Number given to this process:** Coating Line #1 (CF-03)

3. **Type of surface coating process:**

- ☐ Can coating
- ☑ Coil coating
- ☐ Metal furniture coating
- ☐ Surface coating of large appliances
- ☐ Misc. metal parts & products
- ☐ Other (specify):
- ☐ Flatwood paneling coating
- ☐ Paper, fabric and vinyl coating
- ☐ Magnet wire coating
- ☐ Automobile and light duty truck manufacturing

4. **Briefly describe the operation of this surface coating process in your facility:**

See Section 2 of the application narrative for a detailed write-up of all process flows, emissions units, and control devices.

5. **Normal operating schedule:**

Hours/ day: 24 **Days/ week:** 7 **Weeks/ year:** 52

Peak production season (if any): N/A

6. Coating material used in unit or process (as applied). Do not include diluents added to coatings (see item 7).

Coating Material	Coating Method	Max. gal/hr	Total gal/yr.	Density lbs/gal	% wt Solid	% wt Water	% wt VOC	VOC's applied lbs/year
Various Water-Based and Solvent-Based Can Stock Coatings	Roll Coating	~390	~3,413,793	8.65	30.20%	63.2%-73.6%	26.4%-36.8%	10,371,840

Total (lbs/year)	10,371,840
Total (tons/year)	5,186

7. Description of organic liquid diluents (coating thinners & additives) added to the surface coatings:

Diluents	Amt. added per gallon	Coating material	Total gal/yr.	Density lbs/gal	% wt Water	% wt VOC	VOC's lbs/year
N/A							
					Total (lbs/year)		
					Total (tons/year)		

8. Description of all organic liquid solvents used for wash or clean up:

Solvents	Total gal/yr.	Density lbs/gal	% wt Water	% wt VOC	VOC's lbs/year
TBD					
			Total (lbs/year)		
			Total (tons/year)		

9. After coating, materials are: ☑ Oven dried ☐ Air dried ☐ Warm air tunnel dried

If oven or warm air tunnel dried, the total fuel heat input is (exclude fuels used by indirect heating equipment previously described on ADEM Form 104.): 44.1 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,000	Btu/ft 3	N/A	N/A	N/A	N/A
L. P. Gas		Btu/ft 3				
Wood		Btu/lb				
Other (specify)						

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack							
	UTM Coordinates		Height Above Grade (Ft)	Base Elevation (Ft)	Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharge d (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
CL1	428.52	3424.42	95.1	265	6.56	30.9	62,676	428

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
CF-03	PM	2.73	11.95	RTO Emissions Performance Spec.	2.73	BACT
CF-03	PM10	2.64	11.56	PM Calculator	2.64	BACT
CF-03	PM2.5	2.22	9.71	PM Calculator	2.22	BACT
CF-03	NOX	6.61	28.97	RTO Emissions Performance Spec.	6.61	BACT
CF-03	CO	13.23	57.94	RTO Emissions Performance Spec.	13.23	BACT
CF-03	VOC	2.89	12.65	RTO Emissions Performance Spec.	2.89	BACT
CF-03	SO2	0.03	0.12	AP-42 Table 1.4-2	176.24	4.0 lb/MMBtu
CF-03	CO2e	5,159	22,598	40 CFR 98 Subpart C	22,598 tpy	BACT
CF-03	Pb	2.20E-05	9.65E-05	AP-42 Table 1.4-4	N/A	N/A
CF-03	THAP	2.73	11.95	AP-42 Tables 1.4-3 & 1.4-4	N/A	N/A

12. Is there any emission control equipment on this unit or process?

☑ yes ☐ no (if "yes", complete ADEM Form 110)

13. Does this process have particulate filters?

☐ yes ☑ no

14. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional pages if necessary):

Novelis requests BACT limits consistent with the PTE values included in Item 11. Compliance with the requested BACT limits will ensure compliance with all other applicable standards.

15. Is this surface coating process in compliance with all applicable air pollution rules and regulations?

☑ yes ☐ no (if "no", complete ADEM Form 437)

16. For existing sources only, include a chronological history of the process, including original installation date, modification date(s), and detailed description of the modification(s).

Name of person preparing application John Colebrook

Signature: John Colebrook **Date:** 11/25/2025

Using a flow diagram, illustrate locations of air contaminant release so that emission points under item 10 can be identified: See Process Flow Diagrams included in Appendix B of the PSD App. As-Built Reconciliation

Novelis Corp. - Bay Minette Facility

ADEM 110 Forms - Scrap Processing Area

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(SCRAP PROCESSING AREA)

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Cold Baghouse #1 for Scrap Processing Line #1 (Flex Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	56.6	28.9	8.5
Designed	5.66	2.89	0.85
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	90%	90%	90%
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	330,000		330,000
(ACFM, existing conditions)	330,000		330,000
Temperature (°F)	80		80
Velocity (ft/sec)	64.5		64.5
Percent moisture			

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.94	(km)	UTM Coordinate (N-S)	3,424.02	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	80.0	(°F)
Inside diameter at exit (round)	10.42	(sq. feet)	Gas Velocity	64.5	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	330,000	(ACFM)
Base Elevation	270	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

N/A

Name of person preparing application John Colebrook

Signature John Colebrook Date 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(SCRAP PROCESSING AREA)

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Cold Baghouse #2 for Scrap Processing Line #2 (CBS Line - UBC)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	53.1	27.1	8.0
Designed	5.31	2.71	0.80
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	90%	90%	90%
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	310,040		310,040
(ACFM, existing conditions)	310,040		310,040
Temperature (°F)	80		80
Velocity (ft/sec)	60.6		60.6
Percent moisture			

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.94	(km)	UTM Coordinate (N-S)	3,423.99	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	80.0	(°F)
Inside diameter at exit (round)	10.42	(sq. feet)	Gas Velocity	60.6	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	310,040	(ACFM)
Base Elevation	270	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(SCRAP PROCESSING AREA)

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Cold Baghouse #3 for Scrap Processing Line #3 (CBS Line - Class 1 & 3)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	20.7	10.6	3.1
Designed	2.07	1.06	0.31
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	90%	90%	90%
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	120,800		120,800
(ACFM, existing conditions)	120,800		120,800
Temperature (°F)	80		80
Velocity (ft/sec)	63.9		63.9
Percent moisture			

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.96	(km)	UTM Coordinate (N-S)	3,424.04	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	80.0	(°F)
Inside diameter at exit (round)	6.33	(sq. feet)	Gas Velocity	63.9	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	120,800	(ACFM)
Base Elevation	270	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(SCRAP PROCESSING AREA)

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Cold Baghouse #4 for Scrap Sorting Line #1 (XRT/Surge Hopper for Flex Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	18.9	9.6	2.8
Designed	1.89	0.96	0.28
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	90%	90%	90%
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	110,000		110,000
(ACFM, existing conditions)	110,000		110,000
Temperature (°F)	80		80
Velocity (ft/sec)	58.2		58.2
Percent moisture			

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.96	(km)	UTM Coordinate (N-S)	3,424.07	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	80.0	(°F)
Inside diameter at exit (round)	6.33	(sq. feet)	Gas Velocity	58.2	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	110,000	(ACFM)
Base Elevation	270	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 110 Forms - Melting & Casting Area

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(MELTING & CASTING AREA)

			-					-				

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Hot Baghouse #1 for Decoater #3 (Flex Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	HCl	
Mass emission rate (#/hr)			
Uncontrolled	80.8	85.4	
Designed	1.62	8.54	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	98%	90%	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	94,305		94,305
(ACFM, existing conditions)	148,500		148,500
Temperature (°F)	338.0		338.0
Velocity (ft/sec)	61.95		61.95
Percent moisture	0.040		0.040

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.90	(km)	UTM Coordinate (N-S)	3424.18	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	216.57	(°F)
Inside diameter at exit (round)	17.00	(sq. feet)	Gas Velocity	62.0	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	843,700	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(MELTING & CASTING AREA)

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Hot Baghouse #2 for Decoater #2 (CBS Line) and Dross House

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	HCl	
Mass emission rate (#/hr)			
Uncontrolled	88.45	85.43	
Designed	2.51	8.54	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	97.2%	90%	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	146,404		146,404
(ACFM, existing conditions)	194,700		194,700
Temperature (°F)	214		214
Velocity (ft/sec)	61.95		61.95
Percent moisture	0.040		0.040

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.90	(km)	UTM Coordinate (N-S)	3424.18	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	216.57	(°F)
Inside diameter at exit (round)	17.00	(sq. feet)	Gas Velocity	62.0	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	843,700	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(MELTING & CASTING AREA)

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Hot Baghouse #3 for Decoater #1 (CBS Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	HCl	
Mass emission rate (#/hr)			
Uncontrolled	84.4	85.4	
Designed	1.69	8.54	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	98%	90%	
Manufacturer's guaranteed			

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	98,504		98,504
(ACFM, existing conditions)	148,500		148,500
Temperature (°F)	304.0		304.0
Velocity (ft/sec)	61.95		61.95
Percent moisture	0.040		0.040

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.90	(km)	UTM Coordinate (N-S)	3424.18	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	216.57	(°F)
Inside diameter at exit (round)	17.00	(sq. feet)	Gas Velocity	62.0	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	843,700	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(MELTING & CASTING AREA)

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Hot Baghouse #4 for Sidewell Melting Furnace #5 (Flex Line) and Sidewell Melting Furnace #4 (Flex Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	HCl	
Mass emission rate (#/hr)			
Uncontrolled	45.7	10.7	
Designed	2.37	1.07	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	94.8%	90%	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	137,967		137,967
(ACFM, existing conditions)	176,000		176,000
Temperature (°F)	200		200
Velocity (ft/sec)	61.95		61.95
Percent moisture	0.020		0.020

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.90	(km)	UTM Coordinate (N-S)	3424.18	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	216.57	(°F)
Inside diameter at exit (round)	17.00	(sq. feet)	Gas Velocity	62.0	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	843,700	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(MELTING & CASTING AREA)

			-					-				

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Hot Baghouse #5 for Sidewell Melting Furnace #2 (CBS Line) and Sidewell Melting Furnace #1 (CBS Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	HCl	
Mass emission rate (#/hr)			
Uncontrolled	45.7	10.7	
Designed	2.37	1.07	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	94.8%	90%	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	137,967		137,967
(ACFM, existing conditions)	176,000		176,000
Temperature (°F)	200		200
Velocity (ft/sec)	61.95		61.95
Percent moisture	0.020		0.020

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.90	(km)	UTM Coordinate (N-S)	3424.18	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	216.57	(°F)
Inside diameter at exit (round)	17.00	(sq. feet)	Gas Velocity	62.0	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	843,700	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(MELTING & CASTING AREA)

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Hot Baghouse #6 for Sidewell Melting Furnace #3 (CBS Line), Holding Furnace #2 (CBS Line), and In-Line Degasser #2 (CBS Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	HCl	
Mass emission rate (#/hr)			
Uncontrolled	34.30	66.84	
Designed	2.94	6.68	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	91.43%	90%	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	107,840		107,840
(ACFM, existing conditions)	135,900		135,900
Temperature (°F)	192		192
Velocity (ft/sec)	62.27		62.27
Percent moisture	0.020		0.020

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.98	(km)	UTM Coordinate (N-S)	3424.30	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	180	(feet)	Gas temperature at exit	203.75	(°F)
Inside diameter at exit (round)	14.83	(sq. feet)	Gas Velocity	62.3	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	645,700	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(MELTING & CASTING AREA)

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Hot Baghouse #7 for Novelis Dual Chamber (NDC) Recycle Furnace #1 (Flex Line), Holding Furnace #3 (Flex Line), and In-Line Degasser #3 (Flex Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	HCl	
Mass emission rate (#/hr)			
Uncontrolled	37.55	68.07	
Designed	3.98	6.81	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	89.41%	90%	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	168,327		168,327
(ACFM, existing conditions)	211,800		211,800
Temperature (°F)	191		191
Velocity (ft/sec)	62.27		62.27
Percent moisture	0.020		0.034

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.98	(km)	UTM Coordinate (N-S)	3424.30	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	180	(feet)	Gas temperature at exit	203.75	(°F)
Inside diameter at exit (round)	14.83	(sq. feet)	Gas Velocity	62.3	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	645,700	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(MELTING & CASTING AREA)

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Hot Baghouse #8 for Round Top Furnace #2 (Flex Line), Holding Furnace #4 (Flex Line), and In-Line Degasser #4 (Flex Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	HCl	
Mass emission rate (#/hr)			
Uncontrolled	26.7	70.19	
Designed	2.95	7.02	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	89.0%	90%	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	108,340		108,340
(ACFM, existing conditions)	149,100		149,100
Temperature (°F)	252		252
Velocity (ft/sec)	62.27		62.27
Percent moisture	0.020		0.020

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.98	(km)	UTM Coordinate (N-S)	3424.30	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	180	(feet)	Gas temperature at exit	203.75	(°F)
Inside diameter at exit (round)	14.83	(sq. feet)	Gas Velocity	62.3	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	645,700	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(MELTING & CASTING AREA)

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☑ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Schust/CAMCORP Model No.: 18TRW14x270

4. Emission source to which device is installed or is to be installed:

Hot Baghouse #9 for Round Top Furnace #1 (CBS Line), Holding Furnace #1 (CBS Line), and In-Line Degasser #1 (CBS Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	HCl	
Mass emission rate (#/hr)			
Uncontrolled	26.6	69.70	
Designed	2.95	6.97	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	88.9%	90%	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	108,340		108,340
(ACFM, existing conditions)	149,100		149,100
Temperature (°F)	252		252
Velocity (ft/sec)	62.27		62.27
Percent moisture	0.020		0.020

Pressure drop across device: 0.5-12 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.98	(km)	UTM Coordinate (N-S)	3424.30	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	180	(feet)	Gas temperature at exit	203.75	(°F)
Inside diameter at exit (round)	14.83	(sq. feet)	Gas Velocity	62.3	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	645,700	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 110 Forms - Hot Rolling Mill

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(HOT ROLLING MILL)

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): Post-Cyclone Filtration Unit

3. Control device manufacturer's information:

Name of manufacturer: Donaldson Torit® or Equivalent Model No. _____

4. Emission source to which device is installed or is to be installed:

Filtration Unit #4 for Scalper #1

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM		
Mass emission rate (#/hr)			
Uncontrolled	6.2		
Designed	0.65		
Manufacturer's guaranteed	N/A		
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A		
Removal efficiency (%)			
Designed	89.4%		
Manufacturer's guaranteed	N/A		

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	76,328		76,328
(ACFM, existing conditions)	78,063		78,063
Temperature (°F)	80		80
Velocity (ft/sec)	54.8		54.8
Percent moisture	0.000		Neg.

Pressure drop across device: 0.5-6 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	429.02	(km)	UTM Coordinate (N-S)	3,424.40	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	145	(feet)	Gas temperature at exit	80.0	(°F)
Inside diameter at exit (round)	5.50	(sq. feet)	Gas Velocity	54.8	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	78,063	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(HOT ROLLING MILL)

			-					-				

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): Mult-Stage Mist Eliminator

3. Control device manufacturer's information:

Name of manufacturer: CECO Busch Model No.: Custom Fume Exhaust System

4. Emission source to which device is installed or is to be installed:

Mist Eliminator #1 for Hot Reversing Mill

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filt. PM	Total PM10	Total PM2.5
Mass emission rate (#/hr)			
Uncontrolled	7.62	11.24	9.33
Designed	3.20	7.07	6.50
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	58.0%	37.1%	30.3%
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	186,651		186,651
(ACFM, existing conditions)	217,500		217,500
Temperature (°F)	130.0		130.0
Velocity (ft/sec)	32.1		32.1
Percent moisture	0.041		0.041

Pressure drop across device: 3-7 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	429.35	(km)	UTM Coordinate (N-S)	3,424.60	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	150	(feet)	Gas temperature at exit	130.0	(°F)
Inside diameter at exit (round)	12.00	(sq. feet)	Gas Velocity	32.1	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	217,500	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(HOT ROLLING MILL)

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind):

Stage 1 - Vapor balance (type):

Other (describe): Mult-Stage Mist Eliminator

3. Control device manufacturer's information:

Name of manufacturer: CECO Busch Model No.: Custom Fume Exhaust System

4. Emission source to which device is installed or is to be installed:

Mist Eliminator #2 for Hot Finishing Mill

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filt. PM	Total PM10	Total PM2.5
Mass emission rate (#/hr)			
Uncontrolled	17.49	24.52	21.40
Designed	6.36	14.44	13.03
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	63.7%	41.1%	39.1%
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	370,755		370,755
(ACFM, existing conditions)	435,000		435,000
Temperature (°F)	130.0		130.0
Velocity (ft/sec)	31.9		31.9
Percent moisture	0.040		0.040

Pressure drop across device: 3-7 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	429.03	(km)	UTM Coordinate (N-S)	3,424.61	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	150	(feet)	Gas temperature at exit	130.0	(°F)
Inside diameter at exit (round)	17.0	(sq. feet)	Gas Velocity	31.9	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	435,000	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 110 Forms - Cold Rolling Mill

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(COLD ROLLING MILL)

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind):

Stage 1 - Vapor balance (type):

Other (describe): Mult-Stage Mist Eliminator

3. Control device manufacturer's information:

Name of manufacturer: CECO Busch Model No.: Custom

4. Emission source to which device is installed or is to be installed:

Condenser #1 and Mist Eliminator #3 for Tandem Cold Mill #1

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filt. PM	Filt. PM10	Filt. PM2.5
Mass emission rate (#/hr)			
Uncontrolled	15.61	8.88	2.20
Designed	2.34	2.22	1.98
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	85%	75%	10%
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	136,568		136,568
(ACFM, existing conditions)	142,000		142,000
Temperature (°F)	74.7		74.7
Velocity (ft/sec)	27.3		27.3
Percent moisture	0.019		0.019

Pressure drop across device: 0.5-2 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.59	(km)	UTM Coordinate (N-S)	3,424.61	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	74.7	(°F)
Inside diameter at exit (round)	10.5	(sq. feet)	Gas Velocity	27.3	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	142,000	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(COLD ROLLING MILL)

			-					-				

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☑ Condenser
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: CECO Busch Model No.: Custom Fume Exhaust System

4. Emission source to which device is installed or is to be installed:

Condenser #1 and Mist Eliminator #3 for Tandem Cold Mill #1

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	VOC		
Mass emission rate (#/hr)			
Uncontrolled	45.74		
Designed	22.87		
Manufacturer's guaranteed	N/A		
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A		
Removal efficiency (%)			
Designed	50%		
Manufacturer's guaranteed	N/A		

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	136,568		136,568
(ACFM, existing conditions)	142,000		142,000
Temperature (°F)	74.7		74.7
Velocity (ft/sec)	27.3		27.3
Percent moisture	0.019		0.019

Pressure drop across device: 0.5-2 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.59	(km)	UTM Coordinate (N-S)	3,424.61	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	120	(feet)	Gas temperature at exit	74.7	(°F)
Inside diameter at exit (round)	10.5	(sq. feet)	Gas Velocity	27.3	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	142,000	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

Novelis Corp. - Bay Minette Facility

ADEM 110 Forms - Coil Finishing Area

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(COIL FINISHING AREA)

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): Packed Bed

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Various/Custom Model No.: Custom

4. Emission source to which device is installed or is to be installed:

Demister/Scrubber #1 for Alkaline Cleaning Line #1 (Can Coating Line)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	1.4	1.4	1.4
Designed	0.14	0.14	0.14
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	90%	90%	90%
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	6,433		6,433
(ACFM, existing conditions)	7,653		7,653
Temperature (°F)	131		131
Velocity (ft/sec)	41.8		41.8
Percent moisture	0.059		0.059

Pressure drop across device: <4 (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.53	(km)	UTM Coordinate (N-S)	3,424.35	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	98.0	(feet)	Gas temperature at exit	131.0	(°F)
Inside diameter at exit (round)	1.97	(sq. feet)	Gas Velocity	41.8	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	7,653	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(COIL FINISHING AREA)

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☑ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer: Airprotech Model No.: N13410 RTO

4. Emission source to which device is installed or is to be installed:

Regenerative Thermal Oxidizer (RTO) #1 for Coating Line #1

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	VOC		
Mass emission rate (#/hr)			
Uncontrolled	1,184		
Designed	2.89		
Manufacturer's guaranteed	N/A		
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A		
Removal efficiency (%)			
Designed	99.8%		
Manufacturer's guaranteed	N/A		

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	35,313		35,677
(ACFM, existing conditions)	65,410		62,676
Temperature (°F)	518		428
Velocity (ft/sec)	--		30.9
Percent moisture	--		0.043

Pressure drop across device: TBD (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.52	(km)	UTM Coordinate (N-S)	3,424.42	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	95.1	(feet)	Gas temperature at exit	428.0	(°F)
Inside diameter at exit (round)	6.56	(sq. feet)	Gas Velocity	30.9	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	62,676	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height	Refer to BPIP Output	(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE
(COIL FINISHING AREA)

			-					-				

(ADEM Use Only)

1. Name of facility or organization: Novelis Corp. - Bay Minette Facility

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Settling chamber
- ☐ Wet Suppression

Wet scrubber (kind): Venturi

Stage 1 - Vapor balance (type):

Other (describe):

3. Control device manufacturer's information:

Name of manufacturer: Danieli Model No.: Custom

4. Emission source to which device is installed or is to be installed:

Demister/Scrubber #2 for Edge Trimmer- Scrap Baller

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	2.7	2.7	2.7
Designed	0.27	0.27	0.27
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation			
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	90%	90%	90%
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	3,590		3,590
(ACFM, existing conditions)	3,590		3,590
Temperature (ºF)	Amb.		Amb.
Velocity (ft/sec)	45.1		45.1
Percent moisture	--		--

Pressure drop across device: TBD (inches H20)

7. Stack dimensions:

UTM Coordinate (E-W)	428.62	(km)	UTM Coordinate (N-S)	3,424.40	(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade	88.0	(feet)	Gas temperature at exit	Amb.	(°F)
Inside diameter at exit (round)	1.30	(sq. feet)	Gas Velocity	45.1	(Ft/Sec)
Inside area at exit (not round)		(feet)	Volume of gas discharged	3,590	(ACFM)
Base Elevation	265	(feet)	GEP Stack Height		(feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports. See Appendix B for Process and Exhaust Flow Diagrams

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device. N/A

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Standard devices to be installed, no unusual design or operating parameters.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application John Colebrook

Signature John Colebrook **Date** 11/25/2025

APPENDIX E. SAFETY DATA SHEETS (SDS)

As a supplement to the previously provided package of SDS included in the original PSD application, the SDS for chemicals associated with the Bay Minette facility emission units referenced directly in the updated as-built potential emission calculations or other sections of the PSD application not previously provided are summarized in **Table E-1**. A copy of each SDS is included in an electronic file (Appendix E- SDS Elec. Files.zip) provided on a flash drive submitted with this as-built reconciliation application.

Table E-1. Summary of SDS by Emission Unit

Emission Unit	App. C Section	Chemicals	Material Type
DC1-DC4 Casting Unit-Lubricant Usage	Sect. 12.4.1.	MOBIL GARGOYLE ARCTIC SHC	Casting Unit Lubricant
Edge Trimmer-Electrostatic Oiler	Sect. 24.2.1.	BONDERITE L-FM 9800	Tension Leveler Lubricant
		Coralube 4000 CPL 610-014	Tension Leveler Lubricant
		BONDERITE L-FM PL-A	Tension Leveler Lubricant
HRM Storage Tanks	Sect. 33.4.1.	QH EVEROLL™ A 2300 NS1	HRM Base Roll Coolant
HFM Storage Tanks	Sect. 33.4.2.	LMC-xx	HFM Base Roll Coolant
Coating Tank A and Alkaline Cleaning Day Tank	Sect. 33.4.4.	GardoClean S 5675	Alkaline Cleaning Agent
Coating Tank A and Alkaline Cleaning Day Tank	Sect. 33.4.4.	Permatreat 1700	Chromium-Based Strip Pretreatment Chemical
Pretreatment Day Tank 3 and 4	Sect. 33.4.4.	Permatreat 1903	Chromium-Free Strip Pretreatment
Coating Line Tank B and Paint Day Tank 1	Sect. 33.4.4.	Valspar EzDEX® RFU Interior (13Q80AG)	Water-Based Coating
Coating Line Tank C and Paint Day Tank 2	Sect. 33.4.4.	Valpure™ Waterbased End Coating (V70Q05AC)	Water-Based Coating
Coating Line Tank D and Paint Day Tank 3	Sect. 33.4.4.	Valspar EzDEX® Exterior Clear (13Q80CE)	Water-Based Coating
Coating Line Tank E and Paint Day Tank 4	Sect. 33.4.4.	Sherwin-Williams EzDEX® Exterior Clear (4000R008)	Water-Based Coating
Coating Line Tank G	Sect. 33.4.4.	External End Coating (80X-12759)	Water-Based Coating
Paint Day Tank 6	Sect. 33.4.4.	EzDEX® Modified Exterior (13Q80CA)	Water-Based Coating
Paint Day Tank 7	Sect. 33.4.4.	EZDEX(R) COKE GOLD EXTERIOR (13Q80MJ)	Water-Based Coating
Cold Mill Coil Marking Machine	Sect. 37.1.1.	FPD3207618	Ink
Cold Mill Coil Marking Machine	Sect. 37.1.2.	FPD2400929	Ink Solvent
Mill Roll Grinding Machines	Sect. 38.2.1.	Mobilcut 100	Cutting Oil
Bearings Washing Machine, Hot Mill Parts Washing Bay, & Solvent-Containing Parts Washers	Sect. 40.2.1., Sect 41.2.1., & Sect 42.2.1	HOUGHTO-CLEAN(HC)™ 8131	Cleaning Product

APPENDIX F. RBLC AND SIMILAR FACILITY BACT LIMIT SEARCH SUMMARY

- Placeholder – Refer to original PSD application **Appendix F** contents

APPENDIX G. NO_X CONTROL COST ANALYSIS

G-1. Design Information and Assumptions for NOX BACT Cost Evaluations

Table G-1.1. NO_X Emissions Profile and Exhaust Gas Conditions

Parameter	NDC Recycle Furnace and Holding Furnace #3	Units	Reference/Notes
PM Control	Hot Baghouse #7	--	
Exhaust Temperature (Inlet to Control Device)	191	°F	Based on vendor design data
Stack Gas Actual Volumetric Flow Rate	211,800	acfm	Based on vendor design data
Stack Gas Wet Standard Volumetric Flow Rate, at 68°F	171,782	wscfm	Calculated using exhaust temperature and standard temperature (68F)
Nominal Stack Gas Moisture Content	0.020	Moisture Fraction	Nominal stack gas moisture content estimated from similar source stack testing.
Stack Gas Dry Standard Volumetric Flow Rate, at 68°F	168,347	dscfm	Calculated from wet standard flow rate and nominal stack gas moisture content.
Stack Gas Standard Volumetric Flow Rate, at 77°F	174,711	scfm	SCFM flow rates from ACFM flow rates corrected to alternative standard temperature (77F), as several OAQPS correlations use 77F to represent standard conditions; no moisture correction or pressure correction applied.
Stack Gas Actual Volumetric Flow Rate at 700°F	377,401	acfm	ACFM flow rates adjusted to 700F (the inlet temperature for the SCR).
Equivalent Heat Input Capacity	739	MMBtu/hr	Calculated equivalent heat input capacity using equipment wet standard flow rate, wet F-factor for natural gas from EPA Method 19 Table 19-2, and nominal stack gas O2 content of 5%.
Maximum Hourly NO_X Emission Rate	**13.84**	lb/hr	Appendix C - Emission Calculations (Section 3. Rotary Decoater, Section 4. Sidewell Melting Furnaces #1-5, Section 5. Novelis Dual Chamber (NDC) Recycle Furnace,Section 6. Round Top Furnaces, Section 7. Holding Furnaces, Section 17. Pusher Furnaces, and Section 23. Coating Line #1))
Maximum Annual NO_X Emission Rate	**60.63**	ton/yr	Annual NO_X emission rate for each source calculated from hourly emission rate and assuming continuous annual operations.
NO_X Emission Factor	0.019	lb/MMBtu	Calculated equivalent lb/MMBtu based emission factors based on equivalent heat input capacity and hourly emission rate.

Table G-1.2. Preheater Design Basis

Parameter	Hot Baghouse #7	Units	Reference/Notes
Exhaust Flow Rate, Mass Basis	773,932	lb/hr	Dry standard volumetric flow rate converted to mass basis using standard molar volume of an ideal gas and molecular weight of air
Desired SCR Operating Temperature	700	°F	Per EPA's CCM Section 4, Chapter 2, Figure 2.2, a 90% NOx removal efficiency is achieved at a flue gas temperature of 700F
Mean Heat Capacity of Exhaust Stream	0.248	Btu/(lb-°F)	EPA's CCM Section 3.2 Chapter 2, page 2-37; represents the mean heat capacity of the exhaust stream over the temperature range of a SCR system
Heat Required to Increase Exhaust Temperature	126	Btu/lb	Calculation of heat required to raise one pound of exhaust gas from process temperature to desired temperature for selective catalytic reduction (700F)
Natural Gas Usage (No Energy Recovery)	98	MMBtu/hr	Calculation of natural gas usage required to increase exhaust gas temperature to desired level; no energy recovery
Energy Recovery Rate	0.70	--	EPA's CCM Section 3.2 Chapter 2, page 2-43; 70% represents maximum energy recovery accomplished by a catalytic oxidation system (assumed to represent SCR system energy recovery capabilities)
Hourly Natural Gas Usage (with Energy Recovery)	29.3	MMBtu/hr	Calculation of natural gas usage required to increase exhaust gas temperature to desired level; accounting for maximum energy recovery rate
Annual Natural Gas Usage (with Energy Recovery)	256.7	MMscf/yr	Assuming a heating value of 1,000 Btu/scf and continuous annual operations
Annual Cost of Auxiliary Fuel	$1,756,118.76	--	Based on Bay Minette site-specific natural gas pricing ($6.84/Mscf)

Table G-1.3. Constants and Unit Conversions

Constants	**Reference/Notes**
Ideal Gas Constant (R)	
Adder to Convert from Fahrenheit to Rankine	
Standard Temperature	Standard temperature generally defined as 68F
Alternative Standard Temperature	Several OAQPS chapters define standard temperature as 77F, so this value is provided in the constants table as an alternative standard reference temperature
Standard Pressure	
Standard Molar Volume	Volume occupied by 1 lb-mol at standard conditions (77^{o}F, 1 atm)
Molecular Weight of Dry Air (MW_{Air})	Molecular weight calculated for dry air based on 77.9% N2, 20.9% O2, and 0.9% Ar
Density of Air (ρ_{Air})	Molecular weight divided by standard molar volume
Molecular Weight of CO (MW_{CO})	
Density of CO (ρ_{CO})	Molecular weight divided by standard molar volume
Molecular Weight of Fuel (MW_{Fuel})	Fuel is natural gas; molecular weight from EPA NVFEL natural gas fuel analysis spreadsheet, http://www.epa.gov/nvfel/testing/methods.htm
Density of Fuel (ρ_{Fuel})	Molecular weight divided by standard molar volume
Heating Value of Fuel	NG heating value used in all fuel usage calculations based on nominal HHV of natural gas representative for proposed Bay Minette project
Conversions	**Reference/Notes**
Minutes per Hour	
Pounds per Ton	
Days per Year	
Shifts per Day	
Operating Hours per Year	Anticipated maximum operating level
Utility Costs and Employee Wages	
Natural Gas Price	Site-specific estimate based on annual operating costs projections for project budgeting
Electricity Price	Site-specific estimate based on annual operating costs projections for project budgeting
Chemical Engineering Plant Cost Indices	
1990	
1999	https://www.chemengonline.com/pci-home
2002	
2003	https://www.chemengonline.com/pci-home
2022	April 2022 CEPCI cost index

G-7.1. NDC Recycle Furnace and Holding Furnace #3 Data Inputs

Enter the following data for your combustion unit:

Is the combustion unit a utility or industrial boiler? Industrial

What type of fuel does the unit burn? Natural Gas

Is the SCR for a new boiler or retrofit of an existing boiler? New Construction

Complete all of the highlighted data fields:

What is the maximum heat input rate (QB)?	739	MMBtu/hour
What is the higher heating value (HHV) of the fuel?	1,000	Btu/scf
What is the estimated actual annual fuel consumption?	6,473,955,362	scf/Year
Enter the net plant heat input rate (NPHR)	8.2	MMBtu/MW
Plant Elevation	265	Feet above sea level

If the NPHR is not known, use the default NPHR value:

Fuel Type	Default NPHR
Coal	10 MMBtu/MW
Fuel Oil	11 MMBtu/MW
Natural Gas	8.2 MMBtu/MW

Not applicable to units burning fuel oil or natural gas

Type of coal burned: Not Applicable

Enter the sulfur content (%S) = _____ percent by weight

Not applicable to units buring fuel oil or natural gas

Note: The table below is pre-populated with default values for HHV and %S. Please enter the actual values for these parameters in the table below. If the actual value for any parameter is not known, you may use the default values provided.

Coal Type	Fraction in Coal Blend	%S	HHV (Btu/lb)
Bituminous	0	1.84	11,841
Sub-Bituminous	0	0.41	8,826
Lignite	0	0.82	6,685

Please click the calculate button to calculate weighted average values based on the data in the table above.

For coal-fired boilers, you may use either Method 1 or Method 2 to calculate the catalyst replacement cost. The equations for both methods are shown on rows 85 and 86 on the ***Cost Estimate*** tab. Please select your preferred method:

- ○ Method 1
- ○ Method 2
- ◉ Not applicable

Enter the following design parameters for the proposed SCR:

G-7.1. NDC Recycle Furnace and Holding Furnace #3 Data Inputs

Number of days the SCR operates (t_{SCR})	365	days
Number of days the boiler operates (t_{plant})	365	days
Inlet NO_x Emissions (NOx_{in}) to SCR	0.019	lb/MMBtu
Outlet NO_x Emissions (NOx_{out}) from SCR	0.0019	lb/MMBtu
Stoichiometric Ratio Factor (SRF)	0.525	

*The SRF value of 0.525 is a default value. User should enter actual value, if known.

Number of SCR reactor chambers (n_{scr})	1	
Number of catalyst layers (R_{layer})	3	
Number of empty catalyst layers (R_{empty})	1	
Ammonia Slip (Slip) provided by vendor	2	ppm
Volume of the catalyst layers ($Vol_{catalyst}$) (Enter "UNK" if value is not known)	UNK	Cubic feet
Flue gas flow rate ($Q_{fluegas}$) (Enter "UNK" if value is not known)	377,401	acfm

Estimated operating life of the catalyst ($H_{catalyst}$)	24,000	hours
Estimated SCR equipment life	25	Years*

* For industrial boilers, the typical equipment life is between 20 and 25 years.

Gas temperature at the SCR inlet (T)	700	°F
Base case fuel gas volumetric flow rate factor (Q_{fuel})	510.67	ft^3/min-MMBtu/hour

Concentration of reagent as stored (C_{stored})	50	percent*
Density of reagent as stored (ρ_{stored})	71	lb/cubic feet*
Number of days reagent is stored ($t_{storage}$)	14	days

*The reagent concentration of 50% and density of 71 lbs/cft are default values for urea reagent. User should enter actual values for reagent, if different from the default values provided.

Densities of typical SCR reagents:

50% urea solution	71 lbs/ft^3
29.4% aqueous NH_3	56 lbs/ft^3

Select the reagent used: Urea

G-7.1. NDC Recycle Furnace and Holding Furnace #3 Data Inputs

Enter the cost data for the proposed SCR:

Desired dollar-year	2022				
CEPCI for 2022	816.3	Enter the CEPCI value for 2022	541.7	2016 CEPCI	CEPCI = Chemical Engineering Plant Cost Index
Annual Interest Rate (i)	5.5	Percent*			* 5.5 percent is the default bank prime rate. User should enter current bank prime rate (available at https://www.federalreserve.gov/releases/h15/.)
Reagent ($Cost_{reag}$)	1.620	$/gallon for 50% urea			
Electricity ($Cost_{elect}$)	0.0400	$/kWh			
Catalyst cost ($CC_{replace}$)	227.00	$/cubic foot (includes removal and disposal/regeneration of existing catalyst and installation of new catalyst			* $227/cf is a default value for the catalyst cost based on 2016 prices. User should enter actual value, if known.
Operator Labor Rate	24.00	$/hour (including benefits)			
Operator Hours/Day	4.00	hours/day*			* 4 hours/day is a default value for the operator labor. User should enter actual value, if known.

Note: The use of CEPCI in this spreadsheet is not an endorsement of the index, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable.

Maintenance and Administrative Charges Cost Factors:

Maintenance Cost Factor (MCF) =	0.005
Administrative Charges Factor (ACF) =	0.03

G-7.1. NDC Recycle Furnace and Holding Furnace #3 Data Inputs

Data Sources for Default Values Used in Calculations:

Data Element	Default Value	Sources for Default Value	If you used your own site-specific values, please enter the value used and the reference source . . .
Reagent Cost ($/gallon)	$1.66/gallon 50% urea solution	U.S. Environmental Protection Agency (EPA). Documentation for EPA's Power Sector Modeling Platform v6 Using the Integrated Planning Model, Updates to the Cost and Performance for APC Technologies, SCR Cost Development Methodology, Chapter 5, Attachment 5-3, January 2017. Available at: https://www.epa.gov/sites/production/files/2018-05/documents/attachment_5-3_scr_cost_development_methodology.pdf.	
Electricity Cost ($/kWh)	0.0676	U.S. Energy Information Administration. Electric Power Monthly. Table 5.3. Published December 2017. Available at: https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a.	Site-specific estimate based on annual operating costs projections for project budgeting
Percent sulfur content for Coal (% weight)		Not applicable to units burning fuel oil or natural gas	
Higher Heating Value (HHV) (Btu/lb)	1,033	2016 natural gas data compiled by the Office of Oil, Gas, and Coal Supply Statistics, U.S. Energy Information Administration (EIA) from data reported on EIA Form EIA-923, Power Plant Operations Report. Available at http://www.eia.gov/electricity/data/eia923/.	NG heating value used in all fuel usage calculations based on nominal HHV of natural gas representative for proposed casting project
Catalyst Cost ($/cubic foot)	227	U.S. Environmental Protection Agency (EPA). Documentation for EPA's Power Sector Modeling Platform v6 Using the Integrated Planning Model. Office of Air and Radiation. May 2018. Available at: https://www.epa.gov/airmarkets/documentation-epas-power-sector-modeling-platform-v6.	
Operator Labor Rate ($/hour)	$60.00	U.S. Environmental Protection Agency (EPA). Documentation for EPA's Power Sector Modeling Platform v6 Using the Integrated Planning Model. Office of Air and Radiation. May 2018. Available at: https://www.epa.gov/airmarkets/documentation-epas-power-sector-modeling-platform-v6.	Site-specific estimate based on annual operating costs projections for project budgeting
Interest Rate (Percent)	5.5	Default bank prime rate	

G-7.2. NDC Recycle Furnace and Holding Furnace #3 SCR Design Parameters

The following design parameters for the SCR were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

Parameter	Equation	Calculated Value	Units	
Maximum Annual Heat Input Rate (Q_B) =	HHV x Max. Fuel Rate =	739	MMBtu/hour	
Maximum Annual fuel consumption (mfuel) =	(QB x 1.0E6 x 8760)/HHV =	6,473,955,362	scf/Year	
Actual Annual fuel consumption (Mactual) =		6,473,955,362	scf/Year	
Heat Rate Factor (HRF) =	NPHR/10 =	0.82		
Total System Capacity Factor (CF_{total}) =	(Mactual/Mfuel) x (tscr/tplant) =	1.000	fraction	
Total operating time for the SCR (t_{op}) =	CF_{total} x 8760 =	8760	hours	
NOx Removal Efficiency (EF) =	(NOx_{in} - NOx_{out})/NOx_{in} =	90.0	percent	
NOx removed per hour =	NOx_{in} x EF x Q_B =	12.46	lb/hour	
Total NO_x removed per year =	(NOx_{in} x EF x Q_B x t_{op})/2000 =	54.57	tons/year	
NO_x removal factor (NRF) =	EF/80 =	1.13		
Volumetric flue gas flow rate ($q_{flue\ gas}$) =	Q_{fuel} x QB x (460 + T)/(460 + 700)n_{scr} =	377,401	acfm	
Space velocity (V_{space}) =	$q_{flue\ gas}$/$Vol_{catalyst}$ =	147.55	/hour	
Residence Time	1/V_{space}	0.01	hour	
Coal Factor (CoalF) =	1 for oil and natural gas; 1 for bituminous; 1.05 for sub-bituminous; 1.07 for lignite (weighted average is used for coal blends)	1.00		
SO_2 Emission rate =	(%S/100)x(64/32)*1x10^6)/HHV =			Not applicable; factor applies only to coal-fired boilers
Elevation Factor (ELEVF) =	14.7 psia/P =			Not applicable; elevation factor does not apply to plants located at elevations below 500 feet.
Atmospheric pressure at sea level (P) =	2116 x [(59-(0.00356xh)+459.7)/518.6]$^{5.256}$ x (1/144)* =	14.6	psia	
Retrofit Factor (RF)	New Construction	0.80		

* Equation is from the National Aeronautics and Space Administration (NASA), Earth Atmosphere Model. Available at https://spaceflightsystems.grc.nasa.gov/education/rocket/atmos.html.

G-7.2. NDC Recycle Furnace and Holding Furnace #3 SCR Design Parameters

Catalyst Data:

Parameter	Equation	Calculated Value	Units
Future worth factor (FWF) =	(interest rate)(1/((1+ interest rate)^{Y} -1) , where Y = $H_{catalyts}/(t_{SCR}$ x 24 hours) rounded to the nearest integer	0.3157	Fraction
Catalyst volume ($Vol_{catalyst}$) =	2.81 x Q_B x EF_{adj} x Slipadj x NOx_{adj} x S_{adj} x (T_{adj}/N_{scr})	2,557.78	Cubic feet
Cross sectional area of the catalyst ($A_{catalyst}$) =	$q_{flue\ gas}$ /(16ft/sec x 60 sec/min)	393	ft^2
Height of each catalyst layer (H_{layer}) =	($Vol_{catalyst}/(R_{layer}$ x $A_{catalyst}$)) + 1 (rounded to next highest integer)	3	feet

SCR Reactor Data:

Parameter	Equation	Calculated Value	Units
Cross sectional area of the reactor (A_{SCR}) =	1.15 x $A_{catalyst}$	452	ft^2
Reactor length and width dimensions for a square reactor =	$(A_{SCR})^{0.5}$	21.3	feet
Reactor height =	(R_{layer} + R_{empty}) x (7ft + h_{layer}) + 9ft	50	feet

Reagent Data:

Type of reagent used: Urea

Molecular Weight of Reagent (MW) = 60.06 g/mole

Density = 71 lb/ft^3

Parameter	Equation	Calculated Value	Units
Reagent consumption rate ($m_{reagent}$) =	(NOx_{in} x Q_B x EF x SRF x MW_R)/MW_{NOx} =	9	lb/hour
Reagent Usage Rate (m_{sol}) =	$m_{reagent}$/Csol =	17	lb/hour
	(m_{sol} x 7.4805)/Reagent Density	2	gal/hour
Estimated tank volume for reagent storage =	(m_{sol} x 7.4805 x $t_{storage}$ x 24)/Reagent Density =	700	gallons (storage needed to store a 14 day reagent supply rounded to the nearest 100 gallons)

Capital Recovery Factor:

Parameter	Equation	Calculated Value
Capital Recovery Factor (CRF) =	i (1+ i)^{n}/(1+ i)^{n} - 1 = Where n = Equipment Life and i= Interest Rate	0.0745

Other parameters	Equation	Calculated Value	Units
Electricity Usage: Electricity Consumption (P) =	A x 1,000 x 0.0056 x (CoalF x HRF)$^{0.43}$ = where A = (0.1 x QB) for industrial boilers.	380.01	kW

G-7.3. NDC Recycle Furnace and Holding Furnace #3 Cost Estimate

Total Capital Investment (TCI)

TCI for Oil and Natural Gas Boilers

For Oil and Natural Gas-Fired Utility Boilers between 25MW and 500 MW:

$$TCI = 86{,}380 \times (200/B_{MW})^{0.35} \times B_{MW} \times ELEVF \times RF$$

For Oil and Natural Gas-Fired Utility Boilers >500 MW:

$$TCI = 62{,}680 \times B_{MW} \times ELEVF \times RF$$

For Oil-Fired Industrial Boilers between 275 and 5,500 MMBTU/hour :

$$TCI = 7{,}850 \times (2{,}200/Q_B)^{0.35} \times Q_B \times ELEVF \times RF$$

For Natural Gas-Fired Industrial Boilers between 205 and 4,100 MMBTU/hour :

$$TCI = 10{,}530 \times (1{,}640/Q_B)^{0.35} \times Q_B \times ELEVF \times RF$$

For Oil-Fired Industrial Boilers >5,500 MMBtu/hour:

$$TCI = 5{,}700 \times Q_B \times ELEVF \times RF$$

For Natural Gas-Fired Industrial Boilers >4,100 MMBtu/hour:

$$TCI = 7{,}640 \times Q_B \times ELEVF \times RF$$

Total Capital Investment (TCI) =	$12,400,446	in 2022 dollars

Annual Costs

Total Annual Cost (TAC)

TAC = Direct Annual Costs + Indirect Annual Costs

Direct Annual Costs (DAC) =	$281,788	in 2022 dollars
Indirect Annual Costs (IDAC) =	$925,628	in 2022 dollars
Total annual costs (TAC) = DAC + IDAC	$1,207,416	in 2022 dollars

G-7.3. NDC Recycle Furnace and Holding Furnace #3 Cost Estimate

Direct Annual Costs (DAC)

DAC = (Annual Maintenance Cost) + (Annual Reagent Cost) + (Annual Electricity Cost) + (Annual Catalyst Cost)

Annual Maintenance Cost =	0.005 x TCI =	$62,002 in 2022 dollars
Annual Reagent Cost =	m_{sol} x $Cost_{reag}$ x t_{op} =	$25,530 in 2022 dollars
Annual Electricity Cost =	P x $Cost_{elect}$ x t_{op} =	$133,155 in 2022 dollars
Annual Catalyst Replacement Cost =		$61,100 in 2022 dollars
	n_{scr} x Vol_{cat} x ($CC_{replace}/R_{layer}$) x FWF	
Direct Annual Cost =		$281,788 in 2022 dollars

Indirect Annual Cost (IDAC)

IDAC = Administrative Charges + Capital Recovery Costs

Administrative Charges (AC) =	0.03 x (Operator Cost + 0.4 x Annual Maintenance Cost) =	$1,795 in 2022 dollars
Capital Recovery Costs (CR)=	CRF x TCI =	$923,833 in 2022 dollars
Indirect Annual Cost (IDAC) =	AC + CR =	$925,628 in 2022 dollars

Cost Effectiveness

Cost Effectiveness = Total Annual Cost/ NOx Removed/year

Total Annual Cost (TAC) =	$1,207,416	per year in 2022 dollars
Total Annual Auxilary Fuel Cost =	$1,745,912	per year in 2022 dollars
NOx Removed =	55	tons/year
Cost Effectiveness =	$54,125	per ton of NOx removed in 2022 dollars

APPENDIX H. CO CONTROL COST ANALYSIS

- Placeholder – Refer to original PSD application **Appendix H** contents

APPENDIX I. VOC CONTROL COST ANALYSIS

I-7.1. Tandem Cold Mill with RTO Data Inputs

Select the type of oxidizer: Regenerative Thermal Oxidizer

Enter the following information for your emission source:

Composition of Inlet Gas Stream

Pollutant Name	Concentration (ppmv)	Lower Explosive Limit (LEL) (ppmv)*	Heat of Combustion (Btu/scf)	Molecular Weight
Tetradecane	5.14	5,000	9,753	198.39

Note: The lower explosion limit (LEL), heat of combustion and molecular weight for some commonly used VOC/HAP are provided in the table below.

Enter the design data for the proposed oxidizer:

Number of operating hours/year	8,760	hours/year	
Inlet volumetric flow rate(Q_{wi}) at 77°F and 1 atm.	138,896	scfm	
Inlet volumetric flow rate(Q_{wi}) (actual conditions)	142,000	acfm	
Pressure drop (ΔP)	19	inches of water	* 23 inches of water is the default pressure drop for thermal oxidizers; 19 inches of water is the default pressure drop for catalytic oxidizers. Enter actual value, if known.
Motor/Fan Efficiency (ε)	60	percent*	* 60% is a default fan efficiency. User should enter actual value, if known.
Inlet Waste Gas Temperature (T_{wi})	74.7	°F	
Operating Temperature (T_{fi})	1,900	°F	* Note: Default value for Tfi is 2000°F for thermal regenerative oxidizers. Use actual value if known. Tfi for regenerative oxidizers typically between 1800 and 2000°F.
Destruction and Removal Efficiency (DRE)	99	percent*	* 99 percent is a default control efficiency. User should enter actual value, if known.
Estimated Equipment Life	20	Years*	* 20 years is the typical equipment life. User should enter actual value, if known.
Heat Loss (η)	1	percent*	* 1 percent is a default value for the heat loss. User should enter actual value, if known. Heat loss is typically between 0.2 and 1.5%.

Percent Energy Recovery (HR) = 0 percent

Enter the cost data:

Desired dollar-year	2022			
CEPCI* for 2022	816.3	Enter the CEPCI value for 2022	541.7	2016 CEPCI
Annual Interest Rate (i)	4.75	Percent		
Electricity ($Cost_{elect}$)	0.04	$/kWh		
Natural Gas Fuel Cost ($Cost_{fuel}$)	0.006705882	$/scf		
Operator Labor Rate	$24.00	per hour		
Maintenance Labor rate	$40.00	per hour		
Contingency Factor (CF)	10.0	Percent		

* 10 percent is a default value for construction contingencies. User may enter values between 5 and 15 percent.

* CEPCI is the Chemical Engineering Plant Cost Escalation/De-escalation Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purposes of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable.

I-7.1. Tandem Cold Mill with RTO Data Inputs

Data Sources for Default Values Used in Calculations:

Parameters for Common Compounds:

Compound	LEL (ppmv)	Heat of Combustion (Btu/scf)	Molecular Weight
Methane*	50,000	911	16.04
Ethane	30,000	1,631	30.07
Propane	21,000	2,353	44.09
Butane	19,000	3,101	58.12
Pentane	14,000	3,709	72.15
Hexane	11,000	4,404	86.17
Octane	10,000	5,796	114.23
Nonane	8,000	6,493	128.25
Decane	8,000	7,190	142.28
Ethylene**	27,000	1,499	28.05
Propylene	20,000	2,182	42.08
Cyclohexane	13,000	4,180	84.16
Benzene**	14,000	3,475	78.11
Toluene**	11,000	4,274	92.13
Methyl Chloride (Chloromethane)**	82,500	705	50.49
Footnotes			
* Greenhouse gas.			
** Hazardous air pollutant.			

Data Element	Default Value	Sources for Default Values used in the calculation . . .	If you used your own site-specific values, please enter the value used and the reference source . . .
Electricity Cost ($/kWh)	0.04	Average annual electricity cost for industrial plants is based on 2016 price data compiled by the U.S. Energy Information Administration from data reported on Form EIA-861 and 861S, (http://www.eia.gov/electricity/data.cfm#sales).	Site-specific estimate based on annual operating costs projections for project budgeting
Fuel Cost ($/MMBtu)	6.706	Annual average price paid for natural gas by industrial facilities in 2016 from the U.S. Energy Information Administration. Available at http://www.eia.gov/dnav/ng/hist/n3035us3A.htm.	Site-specific estimate based on annual operating costs projections for project budgeting
Operator Labor ($/hour)	24.00	Bureau of Labor Statistics, May 2016 National Occupational Employment and Wage Estimates – United States, May 2016 (https://www.bls.gov/oes/current/oes_nat.htm). Hourly rates for operators based on data for plant and System Operators – other (51-8099).	Site-specific estimate based on annual operating costs projections for project budgeting
Maintenance Labor ($/hour)	40.00	Bureau of Labor Statistics, May 2016 National Occupational Employment and Wage Estimates – United States, May 2016 (https://www.bls.gov/oes/current/oes_nat.htm). Hourly rates for maintenance workers based on electrical and electronics commercial and industrial equipment repairers (49-2094).	Site-specific estimate based on annual operating costs projections for project budgeting

I-7.2. Tandem Cold Mill with RTO Design Parameters

The following design parameters for the oxidizer were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

Composition of Inlet Gas Stream		
Pollutant Name	**Concentration in Waste Stream (ppmv) From Data Inputs Tab**	**Adjusted Concentration with Dilution Air (ppmv)**
Tetradecane	5	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
Total	5	0

Constants used in calculations:

Temperature of auxiliary fuel (T_{af}) =	Reference Temperature (T_{ref}) =	77.0	°F
Density of auxiliary Fuel at 77 °F (ρ_{af}) =		0.0408	lb/ft^3
Heat Input of auxiliary fuel ($-\Delta h_{caf}$) =		21,502	Btu/lb
Density of waste gas at 77 °F (ρ_{wi}) =		0.0739	lb/ft^3
Mean Heat Capacity of Air (C_{pmair})	(For thermal oxidizers)	0.255	Btu/lb °F

I-7.2. Tandem Cold Mill with RTO Design Parameters

Parameter	Equation	Calculated Value	Units	Calculated Value	Units
Sum of volume fraction of combustible components =	= ($\sum x_i$) =	5	ppmv		
Lower Explosive Limit of waste gas (LEL_{mix})	= $[\sum((x_i)/((\sum x_i) \times LEL_j))]^{-1}$ =	5,000	ppmv		
	Where x_j is the volume fraction and LEL_j the lower explosive limit for each combustible component in the waste gas.				
% LEL_{mix}	= (Total Combustible Conc. In Mixture/LEL_{mix}) × 100 =	0.10	percent	* Note: Since the LEL of the waste gas stream is below 25%, no dilution air is needed.	
Dilution Factor	= (LEL_{mix} x 0.249)/($\sum x_i$) =	Not applicable			
Lower Explosive Limit (LEL) of waste gas after addition of dilution air	= (Total Adjusted Conc. With Dilution Air/LEL_{mix}) × 100 =	Not Applicable			
Inlet volumetric flow rate(Qwi) at 77°F and 1 atm.	(From Data Inputs Tab) =	138,896	scfm		
Oxygen Content of gas stream	= 100 - ($\sum x_j \times 100/10^6$) x 0.209 =	20.90	percent		
Fan Power Consumption (FP)	= $[(1.17 \times 10^{-4}) \times Q_{wi} \times \Delta P]/\varepsilon$	526.1	kW		
Q_{wo}	≈ Q_{wi} =	138,896	scfm		
Operating temperature of oxidizer (T_{fi})	(From Data Inputs Tab)	1,900	°F		
Temperature of waste gas at outlet to preheater (T_{wo})	= Heat Recovery × (T_{fi} - T_{wi}) + T_{wi} =	75	°F		
Temperature of flue gas exiting the regenerative oxidizer (T_{fo})	= T_{fi} - 0.95(T_{fi} - T_{wi}) =	166	°F		
Heat Input of waste gas (-Δh_{cwi})					
	= $\sum$ (-Δh_{ci}) x_i				
	Where (-Δh_{ci}) is the heat of combustion and x_i the fraction of component "i" at 77 °F.	0.05	Btu/scf	0.7	Btu/lb
Estimated Auxiliary Fuel Flow (Q_{af}) at 77 °F and 1 atm.	(Calculated using Equation 2.45 in Appendix B)	1.92	scfm		
Auxiliary fuel Energy Input =		1,688	Btu/min		
Minimum Energy required for combustion stabilization =	= 5% × Total Energy Input = 0.05 × ρ_{fi} × Q_{fi} × C_{pmfi} × (T_{fi} - T_{ref}) =	238,581	Btu/min		
Is the calculated auxiliary fuel sufficient to stabilize combustion? input > 5% of Total Energy Input, then the auxilary fuel is sufficient.)	(Note: If the auxiliary fuel energy	No		Note: Additional auxiliary fuel equivalent to 5% of total energy input is required to stabilize combustion.	
Auxiliary fuel flow (Qaf) (adjusted for fuel required for combustion stabilization)	at 77°F and 1 atm. =	272	scfm		
Total Volumetric Throughput (Q_{tot}) at 77 °F and 1 atm.	= Q_{fi} = Q_{wo} + Q_a + Q_{af} = Q_{wi} + Q_{af} =	139,168	scfm		

Capital Recovery Factor:

Parameter	Equation	Calculated Value
Capital Recovery Factor (CRF) =	$i(1+i)^n/(1+i)^n - 1$ =	0.0786
	Where n = Equipment Life and i= Interest Rate	

I-7.3. Tandem Cold Mill with RTO Cost Estimate

Direct Costs			
Total Purchased equipment costs (in 2022 dollars)			
Incinerator + auxiliary equipment[a] (A) =			
Equipment Costs (EC) for Regenerative Oxidizer	=[2.664 x 100,000 + (13.98 x Qtot)] x (2022 CEPI/2016 CEPCI) =	$3,333,262	in 2022 dollars
Instrumentation[b] =	0.10 × A =	$333,326	
Sales taxes =	0.03 × A =	$99,998	
Freight =	0.05 × A =	$166,663	
	Total Purchased equipment costs (B) =	$3,933,249	in 2022 dollars

Footnotes
a - Auxiliary equipment includes equipment (e.g., duct work) normally not included with unit furnished by incinerator vendor.
b - Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (in 2022 dollars)			
Foundations and Supports =	0.08 × B =	$314,660	
Handlong and Errection =	0.14 × B =	$550,655	
Electrical =	0.04 × B =	$157,330	
Piping =	0.02 × B =	$78,665	
Insulation for Ductwork =	0.01 × B =	$39,332	
Painting =	0.01 × B =	$39,332	
Site Preparation (SP) =		$0	
Buildings (Bldg) =		$0	
	Total Direct Installaton Costs =	$1,179,975	
Total Direct Costs (DC) =	Total Purchase Equipment Costs (B) + Total Direct Installation Costs =	$5,113,224	in 2022 dollars

Total Indirect Installation Costs (in 2022 dollars)			
Engineering =	0.10 × B =	$393,325	
Construction and field expenses =	0.05 × B =	$196,662	
Contractor fees =	0.10 × B =	$393,325	
Start-up =	0.02 × B =	$78,665	
Performance test =	0.01 × B =	$39,332	
	Total Indirect Costs (IC) =	$1,101,310	
Continency Cost (C) =	CF(IC+DC)=	$621,453	
Total Capital Investment =	**DC + IC +C =**	**$6,835,987**	**in 2022 dollars**

I-7.3. Tandem Cold Mill with RTO Cost Estimate

Direct Annual Costs

Annual Electricity Cost	= Fan Power Consumption × Operating Hours/year × Electricity Price =	$184,349
Annual Fuel Costs for Natural Gas	= $Cost_{fuel}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$958,537
Operating Labor	Operator = 0.5hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$13,140
	Supervisor = 15% of Operator	$1,971
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$21,900
	Materials = 100% of maintenance labor	$21,900

Direct Annual Costs (DC) = $1,201,797 in 2022 dollars

Indirect Annual Costs

Overhead	= 60% of sum of operating, supervisor, maintenance labor and maintenance materials	$35,347
Administrative Charges	= 2% of TCI	$136,720
Property Taxes	= 1% of TCI	$68,360
Insurance	= 1% of TCI	$68,360
Capital Recovery	= CRF[TCI-1.08(cat. Cost)]	$536,970

Indirect Annual Costs (IC) = $845,756 in 2022 dollars

Total Annual Cost = DC + IC = $2,047,553 in 2022 dollars

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$2,047,553	per year in 2022 dollars
VOC/HAP Pollutants Destroyed =	78.8	tons/year
Cost Effectiveness =	$25,983	per ton of pollutants removed in 2022 dollars

I-8.1. Tandem Cold Mill with Condenser Data Inputs

Is the condenser a packaged, custom or gasoline vapor recovery system? Packaged Condenser System

Enter the design data for the proposed condenser:

Number of operating hours per year and per day (Θ_s)	8,760	hours/year	24	hours/day
Volumetric flow rate of the waste stream (Q_{in})	138,896	scfm (at 77 °F; 1 atm)		
Inlet stream temperature (T_{in})	74.67	°F		
Required VOC removal efficiency (η)	90	%*	* 90% is a default control efficiency. User should enter actual value, if known.	
Specific heat of the coolant ($C_{p,cool}$)	0.65	Btu/lb-mole-°F*	* 0.65 Btu/lb-mole-°F is a default value. User should enter actual value, if known.	
Estimated equipment life (n)	15	Years*	* 15 years is a default equipment life. User should enter actual value, if known.	
Overall heat transfer coefficient (U)	20	Btu/hour-ft^2-°F*	* 20 Btu/hour-ft^2-°F is a default heat transfer coefficient. User should enter actual value, if known.	
Mechanical efficiency of compressor (η_{comp})	85	%*	* 85% is a default value. User should enter actual value, if known.	

Enter the Characteristics of the VOC/HAP:

Name of VOC/HAP	Chemical Surrogate		
Molecular Weight of Chemical Surrogate (MW)	198.39	lb./mole	**Note:**
Density of Chemical Surrogate	6.32	lb./gallon	Values for several common compounds are included on the
Heat Capacity of Chemical Surrogate (Cp,voc)	79.58	Btu/lb.-mole-°F	Table A (Physical Properties) and Table B (Antoine Constants)
Heat of Condensation of Chemical Surrogate (ΔHref)	29,559	Btu/lb.-mole	tabs.
Boiling Point of Chemical Surrogate	488.44	°F	
Antoine Equation Constants for Chemical Surrogate	A	B	C
	7.26	1914.86	183.519
Critical Temperature for Chemical Surrogate	1247.73	°R	
Volume Fraction of Chemical Surrogate in waste stream entering the condenser (Yvoc,in)	0.00000514		

Enter the cost data for the condenser:

Electricity ($Cost_{elect}$)	$0.0400	per kWh		
Operator Labor Rate	$24.00	per hour		
Maintenance Labor Rate	$40.00	per hour		
Re-Sale Value of Recovered VOC (Credit)	$0.00	per lb		
Contingency Factor (CF)	10.0	percent*	* 10 percent is a default value. The contingency factor should be between 5 and 15 percent.	
If known, enter any additional costs for site preparation and building construction/modification:				
Site Preparation (SP) =	$0	* Default value. User should enter actual value, if known.		
Buildings (Bldg) =	$0	* Default value. User should enter actual value, if known.		
Desired dollar-year	2022			
CEPCI* for 2022	816.3	Enter the CEPCI value for 2022	576.1	2014 CEPCI
Annual Interest Rate (i)	4.75	% (Default value is 4.25%)		

* CEPCI is the Chemical Engineering Plant Cost Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purpose of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable.

Data Sources for Default Values Used in Calculations:

Data Element	Default Value	Sources for Default Value	If you used your own site-specific values, please reference the source from which the site-specific value was derived.
Electricity Cost ($/kWh)	0.04	Average annual electricity cost for industrial plants is based on 2016 price data compiled by the U.S. Energy Information Administration from data reported on Form EIA-861 and 861S, (http://www.eia.gov/electricity/data.cfm#sales).	Site-specific estimate based on annual operating costs projections for project budgeting
Operator Labor Rate ($/hour)	24.00	Bureau of Labor Statistics, May 2016 National Occupational Employment and Wage Estimates – United States, May 2016 (https://www.bls.gov/oes/current/oes_nat.htm). Hourly rates for operators based on data for plant and System Operators – other (51-8099).	Site-specific estimate based on annual operating costs projections for project budgeting
Maintenance Labor Rate ($/hour)	40.00	Bureau of Labor Statistics, May 2015 National Occupational Employment and Wage Estimates – United States, May 2016 (https://www.bls.gov/oes/current/oes_nat.htm). Hourly rates for maintenance workers based on electrical and electronics commercial and industrial equipment repairers (49-2094).	Site-specific estimate based on annual operating costs projections for project budgeting
Value of Recovered VOC ($/lb.)	$0.00		Assumes no value as recovered VOC will be sent for disposal.

I-8.2. Tandem Cold Mill with Condenser Design Parameters

The following design parameters for the condenser were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

VOC	VOC volume Fraction of waste stream entering the condenser ($Y_{voc,in}$)	Heat Capacity ($C_{p,voc}$) (Btu/lb.-mole-°F)	Heat of Condensation (ΔH_{ref}) (Btu/lb.-mole)
Chemical Surrogate	0.00000514	79.58	29559

Parameter	Equation		Calculated Value	Units
Partial Pressure of Chemical Surrogate VOC in Exit Stream (Pvoc) =	$760 \times (M_{voc,out} / (M_{in} - M_{voc,recovered}))$ =	$760 \times [Y_{voc,in} \times (1 - \eta)] / [1 - (\eta \times Y_{voc,in})]$ =	0.0	mmHg
Estimated Condensation Temperature for Chemical Surrogate (Tcon) =	$((B / (A - \log (P_{voc}))) - C) \times 1.8 + 32$ =		24.8	°F

Parameter	Equation	Calculated Value	Units	Calculated Value	Units
Quantities of VOC in Inlet and Outlet streams:					
Moles of VOC in the inlet stream ($M_{voc,in}$) =	$(Q_{in} / 392) \times (Y_{voc,in}) \times 60$ =	0.109	lb.-moles/hour		
Moles of VOC in the outlet stream ($M_{voc,out}$) =	$M_{voc,in} \times (1 - \eta)$ =	0.011	lb.-moles/hour		
Quantity of VOC Recovered:					
Moles of VOC Recovered ($M_{voc, recovered}$) =	$M_{voc,in} \times \eta$ =	0.098	lb.-moles/hour		
Quantity of VOC Recovered (W_{voc}) =	$M_{voc, recovered} \times MW_{voc}$ =	20	lb./operating hour	85.46	Tons/year
Calculation of Enthalpy of Condensation:					
Critical Temperature for VOC (T_c) =		1248	°R		
Reference Temperature for Heat of Condensation (T_1) =		948	°R		
Condensation Temperature (T_2) =	$T_{con} + 459.67$ =	484	°R		
Enthalpy of condensation of VOC (ΔHvoc) at 24.8 °F =	$\Delta H_{ref} \times [(1 - T_2 / T_c) / (1 - T_1 / T_c)]^{0.38}$ =	42,171	Btu/lb.-mole		
Calculation of Condenser Heat Load:					
Heat capacity of air ($C_{p, air}$) =		6.95	Btu/lb.-mole-°F @ 77 °F and 1 atm.		
Mean Temperature (T_{mean}) =	$(T_{in} + T_{con}) / 2$ =	50	°F		
Enthalpy change associated with the condensed VOC (ΔH_{con}) =	$M_{voc,recovered} \times [\Delta H_{voc} + C_{p,voc} (T_{in} - T_{con})]$=	4,538	Btu/hour		
Enthalpy change associated with the uncondensed VOC (ΔH_{uncon}) =	$M_{voc,out} \times C_{p,voc} \times (T_{in} - T_{con})$ =	43	Btu/hour		
Enthalpy change associated with the non-condensable air (ΔHnoncon) =	$[((Q_{in} / 392) \times 60) - M_{voc,in}] \times C_{p,air} \times (T_{in} - T_{con})$ =	7,375,645	Btu/hour		
Condenser Heat Load (H_{load}) =	$\Delta H_{con} + \Delta H_{uncon} + \Delta H_{noncon}$ =	7,380,227	Btu/hour		
Calculation of Surface Area:					
Temperature of coolant entering the condenser ($T_{cool,in}$) =	$T_{con} - 15$ °F =	9.8	°F		
Temperature of coolant exiting the condenser ($T_{cool,out}$) =	$T_{cool,in} + 25$ °F =	34.8	°F		
Logarithmic mean temperature difference (ΔT_{lm}) =	$\frac{[(T_{in} - T_{cool,out}) - (T_{con} - T_{cool,in})]}{[\ln\{(T_{in} - T_{cool, out})/(T_{con} - T_{cool,in})\}]}$	25.5	°F		
Condenser Surface Area (A_{con}) =	$H_{load} / (U \times \Delta T_{lm})$ =	14494.6	ft^2		
Calculation of Coolant Flow Rate and Refrigeration Capacity:					
Coolant Flow Rate (W_{cool}) =	$H_{load} / (C_{p,cool} \times (T_{cool,out} - T_{cool,in}))$ =	454,168	lb./hour		
Refrigeration Capacity (R) =	H_{load} / 12,000 Btu/ton =	615.02	Tons/hour		
Calculation of Electricity Consumption:					
Estimated Electricity Consumption (E) =	$2.7411 \times \exp(-0.015 \times T_{con})$ =	1.89	kW/ton		
Capital Recovery Factor:					
Capital Recovery Factor (CRF) =	$[i \times (1 + i)^n] / [(1 + i)^n - 1]$ = Where n = Equipment Life and i = Interest Rate	0.0947			

I-8.3. Tandem Cold Mill with Condenser Cost Estimate

Capital Costs

Estimated purchase costs for a packaged condenser

VOC Controlled/Recovered = Chemical Surrogate
Refrigeration Capacity (R) = 615.02 tons/hour
Condensation Temperature for Waste Stream (T_{con}) = 25 °F

Total Capital Investment (TCI) (in 2022 dollars)

Parameter	Equation	Single Stage	Multi-Stage	
Equipment Costs for Single Stage Refrigeration Unit:				
	ECr = 1.611 × exp[9.26 - 0.007 × Tcon + 0.627 × ln(R)] × [2022 CEPCI / 2014 CEPCI] =	$1,130,842		
Equipment Costs for Multistage Refrigeration Unit:				
	ECr = 1.611 × exp[9.73 - 0.012 × Tcon + 0.58 × ln(R)] × [2022 CEPCI / 2014 CEPCI] =		Not applicable*	* A multi-stage condenser is not necessary where Tcon is above -5 °F.
Other Equipment Costs for a Packaged Solvent Recovery System:				
	ECp = 0.25 × ECr =	$282,710	Not applicable	
Costs for Refrigerated Condenser (A) =	ECp + ECr =	$1,413,552	Not applicable	
Instrumentation =	0.10 × A =	Included in A	Included in A	
Sales taxes =	0.03 × A =	$42,407	Not applicable	
Freight =	0.05 × A =	$70,678	Not applicable	
	Total Purchased Equipment Costs (B) =	$1,526,636	Not applicable	
Total Capital Investment For Packaged System=	**Direct Ccsts + Indirect Costs + Contingency = (1.15 × B) =**	**$1,755,632**	**Not applicable**	**in 2022 dollars**

I-8.3. Tandem Cold Mill with Condenser Cost Estimate

Annual Costs

Direct Annual Costs

Parameter	Equation	Single Stage	Multi-Stage	
Annual Electricity Cost =	$(R / \eta_{Comp}) \times E \times \Theta_s \times p_e$ =	$479,422	Not applicable	
Operating Labor =	Operator = 0.5 hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$13,140	Not applicable	
	Supervisor = 15% of Operator	$1,971	Not applicable	
Maintenance Costs =	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$21,900	Not applicable	
	Materials = 100% of maintenance labor	$21,900	Not applicable	
Direct Annual Costs (DAC) =		**$538,333**	**Not applicable**	**in 2022 dollars**

Indirect Annual Costs

Parameter	Equation	Single Stage	Multi-Stage	
Overhead	= 60% of sum of operator, supervisor, maintenance labor Plus maintenance materials	$35,346.60	Not applicable	
Administrative Charges	= 2% of TCI	$35,112.64	Not applicable	
Property Taxes	= 1% of TCI	$17,556.32	Not applicable	
Insurance	= 1% of TCI	$17,556.32	Not applicable	
Capital Recovery	= CRF × TCI	$166,295.44	Not applicable	
Indirect Annual Costs (IAC) =		**$271,867**	**Not applicable**	**in 2022 dollars**

VOC Recovery Credit

Parameter	Equation	Single Stage	Multi-Stage	
Annual Recovery Credit for Condensate (RC)	$= W_{voc} \times Credit \times \Theta_s$ =	$0	Not applicable	
Total Annual Cost (TAC) =	**DAC + IAC - RC =**	**$810,200**	**Not applicable**	**in 2022 dollars**

Cost Effectiveness

Cost Effectiveness

Parameter	Equation	Single Stage	Multi-Stage	
Total Annual Cost =	TAC =	$810,200	Not applicable	per year in 2022 dollars
Annual Quantity of VOC Removed/Recovered =		71.6	71.6	tons/year
Cost Effectiveness =	Total Annual Cost/Annual Quantity of VOC Removed/Recovered =	$11,309	Not applicable	per ton of pollutants removed/recovered in 2022 dollars

Table A: Physical Properties for Selected Compounds

Compound	Critical Temp.[a] (°R)	Boiling Point (°F)	Molecular Weight (lb/lb-mole)	Heat of Condensation[b] (Btu/lb-mole)	Heat Capacity[c] (Btu/lb-mole-°F)	State
Acetone	915	134	58.08	12,520	30.19 17.81	Liquid Gas
Acetylene	555	-119	26.02	7,310	10.54	Gas
Acrylonitrile	965	171	53.06	14,030	15.25	Gas
Aniline	1258	364	93.13	18,240	45.87 25.79	Liquid Gas
Benzene	1012	176	78.11	13,210	32.51	Liquid
Benzonitrile	1259	375 [d]	103.12	19,750	26.08	Gas
Butane	765	31	58.12	9,640	23.31	Gas
Chloroethane	829	54	64.52	10,630	14.96	Gas
Chloroform	966	143	119.39	12,560	15.71	Gas
Chloromethane	749	-12	50.49	9,210	9.75	Gas
Cyclobutane	828	55	56.1	10,410	17.26	Gas
Cyclohexane	996	177	84.16	12,910	37.03 25.41	Liquid Gas
Cyclopentane	921	121	70.13	11,750	30.81 19.84	Liquid Gas
Cyclopropane	716	-27	42.08	8,650	13.29	Gas
Diethyl ether	840	94	74.12	11,400	41.26 28.57	Liquid Gas
Dimethylamine	787	44	45.09	11,360	16.9	Gas
Ethylbenzene	1111	277	106.17	15,320	30.69 [d]	Gas
Ethylene oxide	844	51	44.05	10,970	11.45	Gas
Heptane	972	209	100.12	13,680	53.76 39.68	Liquid Gas
Hexane	914	156	86.18	12,440	46.76 34.21	Liquid Gas
Methanol	923	148	32.04	15,150	19.41 10.54	Liquid Gas
Octane	1024	258	114.23	14,800	45.16	Gas
Pentane	845 [d]	97	72.15	11,100	28.73	Gas
Toluene	1065	231	92.14	14,290	37.53 24.76	Liquid Gas
o - Xylene	1135	292	106.17	15,880	44.49 31.86	Liquid Gas
m - Xylene	1111	282	106.17	15,360	43.82 30.5	Liquid Gas
p - Xylene	1109	281	106.17	15.36	30.33	Gas

[a] Reprinted with permission from the 16th edition of *Lange's Handbook of Chemistry* , Table 2.55 (Speight, 2005).

[b] Reprinted with permission from the 16th edition of *Lange's Handbook of Chemistry* , Table 2.54 (Speight, 2005). (Measured at boiling point).

[c] Reprinted with permission from the 16th edition of *Lange's Handbook of Chemistry* , Table 2.53 (Speight, 2005). (Measured at 77 °F).

[d] These values are taken from the 14th edition of *Lange's Handbook of Chemistry* (Dean, 1992).

Table B: Antoine Equation Constants for Selected Compounds[a]

Compound	Antoine Equation Constants			Valid Temperature Range (°F)
	A	B	C	
Acetone	7.11714	1210.595	229.664	Liquid
Acetylene	9.1402	1232.6	280.9	-202 to -117
	7.0999	711	253.4	-116 to -98
Acrylonitrile	7.03855	1232.53	222.47	-4 to 284
Aniline	7.3201	1731.515	206.049	216 to 365
Benzene	9.1064	1885.9	244.2	10 to 37
	6.90565	1211.033	220.79	46 to 217
Benzonitrile	6.74631	1436.72	181	Liquid
n-Butane	6.80898	935.86	238.73	-107 to 66
Chloroethane	6.98647	1030.01	238.61	-69 to 54
Chloroethylene	6.89117	905.01	239.48	-85 to 9
Chloroform	6.4934	929.44	196.03	-31 to 142
Chloromethane	7.09349	948.58	249.34	-103 to 23
Cyanic acid	7.56859	1251.86	243.79	-105 to 21
Cyclobutane	6.91631	1054.54	241.37	-76 to 54
Cyclohexane	6.8413	1201.53	222.65	68 to 178
Cyclopentane	6.88676	1124.162	231.36	-40 to 162
Cyclopropane	6.88788	856.01	246.5	-130 to -26
Diethyl ether	6.92032	1064.07	228.8	-78 to 68
Diethylamine	5.8016	583.3	144.1	88 to 142
Dimethylamine	7.08212	960.242	221.67	-98 to 44
1,4-Dioxane	7.43158	1554.68	240.34	68 to 221
Ethylbenzene	6.95719	1424.255	213.21	79 to 327
Ethylene oxide	7.12843	1054.54	237.76	-56 to 54
Heptane	6.89677	1264.9	216.54	28 to 255
Hexane	6.87601	1171.17	224.41	-13 to 198
Methanol	7.8975	1474.08	229.13	7 to 149
	7.97328	1515.14	232.85	147 to 230
Octane	6.91868	1351.99	209.15	66 to 306
Pentane	6.85296	1064.84	233.01	-58 to 136
Toluene	6.95464	1344.8	219.48	43 to 279
Vinyl acetate	7.2101	1296.13	226.66	72 to 162
o-Xylene	6.99891	1474.679	213.69	90 to 342
m-Xylene	7.00908	1462.266	215.11	82 to 331
p-Xylene	6.99052	1453.43	215.31	81 to 331

a Reprinted with permission from the 16th edition of *Lange's Handbook of Chemistry* , Table 2.36 (Speight, 2005).

I-9.1. Tandem Cold Mill with Adsorber Data Inputs

Select the type of carbon adsorber system: Fixed-Bed Carbon Adsorber with Steam Regeneration

For fixed-bed carbon adsorbers, provide the following information:

Select the type of operation: Continuous Operation

Select the type of material used to fabricate the carbon adsorber vessels: Stainless Steel, 304

Select the orientation for the adsorber vessels: Horizontal

Enter the design data for the proposed Fixed-Bed Carbon Adsorber with Steam Regeneration

Number of operating hours per year (Θ_a)	8,760	hours/year	
Waste Gas Flow Rate (Q)	142,000	acfm*	*acfm is actual cubic feet/min
VOC Emission Rate (m_{voc})	22.870	lbs/hour	
Required VOC removal efficiency (E)	87.5	percent	
Superficial Bed Velocity (v_b)	75.00	ft/min	
Estimated equipment life of adsorber vessels and auxiliary Equipment (n)	15	Years*	* 15 years is a default equipment life. User should enter actual value, if known.
Estimated Carbon life (n)	5	Years	
Total Number of carbon beds (N_{total})	6	Beds	
Number of carbon beds adsorbing VOC when system is operating (N_A)	4	Beds	
Total time for adsorption (Θ_A)	12	hours*	* 12 hours is a default value. User should enter actual value, if known.
Total time for desorption (Θ_D)	5	hours*	* 5 hours is a default value. User should enter actual value, if known.
Estimated Carbon Replacement Rate (CRR)	379	lbs/hour*	* 379 lbs./hour is a default value. User should enter actual value, if known.

Enter the Characteristics of the VOC/HAP:

Name of VOC/HAP	Vinyl Chloride Surrogate	
Partial Pressure of Vinyl Chloride Surrogate in waste gas stream	0.0001	psia
Parameter "k" for Vinyl Chloride Surrogate	0.2	**Note:**
Parameter "m" for Vinyl Chloride Surrogate	0.477	Typical values of "k" and "m" for some common VOCs are shown in Table A.

Enter the cost data for the carbon adsorber:

Desired dollar-year	2022			
CEPCI* for 2022	816.3	CEPCI value for 2022	390.6	1999
Annual Interest Rate (i)	4.75	percent (Current bank prime rate)		

* CEPCI is the Chemical Engineering Plant Cost Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purpose of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable.

Electricity (P_{elec})	$0.0400	per kWh	
Steam (P_s)	$6.88	per 1,000 lbs	
Cooling Water (P_{cw})	$3.55	per 1,000 gallons of water*	* $3.55/1,000 gallons is a default value. User should enter actual value, if known.
Operator Labor Rate	$24.00	per hour	
Maintenance Labor Rate	$40.00	per hour	
Carbon Cost (CC)	$1.90	per lb*	
Re-Sale Value of Recovered VOC (P_{voc})	$0.00	per lb	
Disposal/Treatment Cost for Recovered VOC (D_{voc})	$0.00	per lb*	* $0/lb is a default value for disposal and/or treatment of recovered VOC/HAP. User should enter actual value, if known. Enter zero if the recovered VOC/HAP can be sold or re-used onsite without additional treatment.

If known, enter any additional costs for site preparation and building construction/modification:

Site Preparation (SP) =	$0	* Default value. User should enter actual value, if known.
Buildings (Bldg) =	$0	* Default value. User should enter actual value, if known.
Equipment Costs for auxiliary equipment (e.g., ductwork, dampers, and stack) (EC_{aux}) =	$32,000	* Default value. User should enter actual value, if known.
Contingency Factor (CF)	10.0	percent* * 10 percent is a default value. The contingency factor should be between 5 and 15 percent.

I-9.1. Tandem Cold Mill with Adsorber Data Inputs

Data Sources for Default Values Used in Calculations:

Data Element	Default Value	Sources for Default Value	If you used your own site-specific values, please reference the source from which the site-specific value was derived.
Carbon Cost ($/lb)	$1.90	January 2018 market price for virgin carbon.	
Operator Labor Rate ($/hour)	24.00	Bureau of Labor Statistics, May 2017 National Occupational Employment and Wage Estimates – United States, May 2017 (https://www.bls.gov/oes/current/oes_nat.htm). Hourly rates for operators based on data for plant and System Operators – other (51-8099).	Site-specific estimate based on annual operating costs projections for project budgeting
Maintenance Labor Rate ($/hour)	40.00	Estimated as 110 percent of operator labor rate.	Site-specific estimate based on annual operating costs projections for project budgeting
Value of Recovered VOC ($/lb.)	$0.00	January 2018 market price for recovered toluene.	Assumes no value as recovered VOC will be sent for disposal.
Disposal/Treatment Cost for Recovered VOC ($/lb)	$0.00	No additional treatment or disposal costs - Recovered VOC can be sold to a solvent recovery company.	Conservatively assumes zero cost for disposal.
Steam ($/1,000 lb)	$6.88	Price of steam was estimated by multiplying the average price of natural gas for industrial facilities ($4.00/MMBtu) by 1.3 and converting to $/1,000 lb of steam. Natural gas price is the 2017 average price for industrial facilities published by the U.S. Department of Energy, Energy Information Administration (see https://www.eia.gov/dnav/ng/ng_pri_sum_dcu_nus_a.htm).	Price adjusted using the default methodology, adjusted using the Annual average price paid for natural gas by industrial facilities in 2021 from the U.S. Energy Information Administration. Available at http://www.eia.gov/dnav/ng/hist/n3035us3A.htm.
Cooling Water ($/1,000 gallons)	$3.55	Average water rates for industrial facilities in 2013, compiled by Black & Veatch. (see 2012/2013 "50 Largest Cities Water/Wastewater Rate Survey." Available at http://www.saws.org/who_we_are/community/RAC/docs/2014/50-largest-cities-brochure-water-wastewater-rate-survey.pdf.	
Electricity Cost ($/kWh)	0.04	Average annual electricity cost for industrial plants is based on 2017 price data compiled by the U.S. Energy Information Administration from data reported on Form EIA-861 and 861S, (http://www.eia.gov/electricity/data.cfm#sales).	Site-specific estimate based on annual operating costs projections for project budgeting

I-9.2. Tandem Cold Mill with Adsorber Design Parameters

The following design parameters for the carbon adsorber were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

Type of Carbon Adsorber:	**Fixed-Bed Carbon Adsorber with Steam Regeneration**
Name of VOC Controlled:	**Vinyl Chloride Surrogate**

Parameter	Equation	Calculated Value	Units
Quantity of Vinyl Chloride Surrogate Recovered:			
Quantity of Vinyl Chloride Surrogate Recovered (Wvoc) =	$W_{voc} = m_{voc} \times \Theta_s \times E =$	87.649	tons/year
Time required for Desorption (Θ_D) =		5	hours
Time for Adsorption (Θ_A) =		12	hours
Time Available for Desorption =	$\Theta_A (N_D/N_A)$ =	6	hours
Adsorber Parameters:			
Equilibrium Capacity at the Inlet ($W_{e(max)}$) =	$k \times P^m$ =	0.002	lb. VOC/lb. Carbon
Working Capacity (w_c) =	$0.5 \times w_{e(max)}$ =	0.001	lb. VOC/lb. Carbon
Adjustment Factor for Adorber Vessel Material (F_m) =		1.0	(* Stainless Steel, 304)
Number of Bed Desorbing (N_D) =	$N_{total} - N_A$ =	2	Bed
Number of Bed Adsorbing (N_A) =		4	Bed
Volumetric Flow Rate for each Vessel (Q') =	Q/N_A =	35,500	acfm/Bed
Carbon Bed Thickness (t_b) =	$(M_c'/\rho_b)/(Q'/v_b)$, where the density of carbon (ρb) = 30 lb/sq.ft	3.91	ft.
Pressure Drop (ΔP_s) =	$t_b \times (0.03679 v_b + 1.107 \times 10^{-4} v_b^2) + 1$ =	14.22	inches
Cooling Fan Operating Time (Θ_{cf}) =	$0.4 \times \Theta_D \times (N_A \times \Theta_s)/\Theta_A$ =	5,840	hours
Estimated Carbon Required:			
Estimated Carbon Consumption (M_c) for a continuously operated system =	$(m_{voc}/w_c) \times \Theta_A (1 + N_D/N_A)$ =	333,072	lbs.
Carbon Required for each Vessel (M_c') =	$M_c/(N_A + N_D)$ =	55,512	lbs./Bed
Estimated Adsorber Vessel Dimensions and Surface Area:			
Vessel Orientation =		Horizontal	
Vessel Diameter (D) =	$(0.127 \times M_c' \times v_b)/Q'$ =	14.89	ft.
Vessel Length (L) =	$(7.87/Mc') \times (Q'/v_b)^2$ =	31.76	ft.
Surface Area of Adsorber Vessel (S) =	$\pi \times D \times (L+D/2)$ =	1835	sq.ft
Electricity Consumption:			
Electricity Consumed by the system fan (Q_{sf}) =	$(0.746kW/hp) \times 2.5 \times 10^{-4} \times Q \times \Delta P_s \times \Theta_s$ =	3,299,148	kWh/year
Electricity Consumed by the cooling fan (Q_{cf}) =	$(0.746kW/hp) \times 2.5 \times 10^{-4} \times Q_{cf} \times \Delta P_s \times \Theta_{cf}$ =	46,467	kWh/year
Electricity Consumed by the Cooling Water Fan (Q_{cwf}) =	$(0.746kW/hp) \times [2.52 \times 10^{-4} \times 100/\eta] \times [\Theta_{cwp}/(0.6 \times \Theta_D \times N_A \times \Theta_D/\Theta_A) \times 60$ mins/hour] =	492	kWh/year
Total Estimated Electricity Consumption (Q_{Elec}) =	Qsf + Qcf + Qcsf =	3,346,106	kWh/year
Steam Consumption:			
Total Steam Consumption (Q_{Steam}) =	$= 3.5 \times M_{voc} \times \Theta_s$ =	701,194	lbs./year
Cooling Water Consumption:			
Total Cooling Water Consumption (Q_{cw}) =	$= 3.43 \times C_w/P_s$ =	2,405,096	gallons/year
Capital Recovery Factor:			
Capital Recovery Factor for adsorber vessels and auxiliary equipment (CFRabsorber)=	$[i \times (1 + i)^n] / [(1 + i)^n - 1]$ = Where n = Equipment Life and i = Interest Rate	0.0947	
Capital Recovery Factor for carbon (CRF_{Carbon}) =	$[i \times (1 + i)^n] / [(1 + i)^n - 1]$ = Where n = Carbon Life and i = Interest Rate	0.2294	

I-9.3. Tandem Cold Mill with Adsorber Cost Estimate

Capital Costs

Estimated capital costs for a Fixed-Bed Carbon Adsorber with Steam Regeneration with the following characteristics:

VOC Controlled/Recovered = Vinyl Chloride Surrogate
Adsorber Vessel Orientation = Horizontal
Operating Schedule = Continuous Operation

Total Capital Investment (TCI) (in 2022 dollars)

Parameter	Equation	Cost	
Costs for Each Carbon Adsorber Vessel (C_v) =	271 x F_m x $S^{0.778}$ =	$195,951	
Total Cost for All Carbon Adsorber Vessels and Carbon(EC_{Adsorb}) =	5.82 x $Q^{-0.133}$ x [C_c + (N_A + N_D) x C_v] =	$2,172,687	
Auxiliary Equipment (EC_{aux}) =	(Based on design costs or estimated using methods provided in Section 2)	$32,000	
Total Purchased Equipment Costs for Carbon Adsorber (A) =	= EC_{Adsorb} + EC_{aux} =	$2,204,687	
Instrumentation =	0.10 × A =	Included in A	
Sales taxes =	0.03 × A =	$66,141	
Freight =	0.05 × A =	$110,234	
	Total Purchased Equipment Costs (B) =	$2,381,062	

Direct Installation Costs (in 2022 dollars)

Parameter	Equation	Cost	
Foundations and Supports =	0.08 × B =	$190,485	
Handling and Erection =	0.14 × B =	$333,349	
Electrical =	0.04 × B =	$95,242	
Piping =	0.02 × B =	$47,621	
Insulation =	0.01 × B =	$23,811	
Painting =	0.01 × B =	$23,811	
Site Preparation (SP) =		$0	
Buildings (Bldg) =		$0	
	Total Direct Costs (DC) = B + (0.3 × B) + SP + Bldg =	$3,095,380	

Total Indirect Installation Costs (in 2022 dollars)

Parameter	Equation	Cost	
Engineering =	0.10 × B =	$238,106	
Construction and field expenses =	0.05 × B =	$119,053	
Contractor fees =	0.10 × B =	$238,106	
Start-up =	0.02 × B =	$47,621	
Performance test =	0.01 × B =	$23,811	
	Total Indirect Costs (IC) =	$666,697	
Contingency Cost (C) =	CF(IC+DC)=	$376,208	
Total Capital Investment (TCI) =	**DC + IC + C = (1.28 × B) + SP + Bldg. + C =**	**$4,138,286**	**in 2022 dollars**

I-9.3. Tandem Cold Mill with Adsorber Cost Estimate

Annual Costs

Direct Annual Costs

Parameter	Equation	Cost	
Annual Electricity Cost =	$Q_{Elec} \times P_{elec}$ =	$133,844	
Annual Steam Cost (C_s) =	3.50 x m_{voc} x Θ_s x P_s =	$4,821	
Annual Cooling Water Cost (C_{cs}) =	3.43 x C_s/P_s x P_{wc} =	$8,538	
Operating Labor Costs:	Operator = 0.5 hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$13,140	
	Supervisor = 15% of Operator	$1,971	
Maintenance Costs:	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$21,900	
	Materials = 100% of maintenance labor	$21,900	
Carbon Replacement Costs:	Labor = CRF_{carbon} x (Labor Rate × M_c)/CRR =	$8,063	
	Carbon = CRF_{carbon} x CC x M_c x 1.08 =	$156,774	

Direct Annual Costs (DAC) =		**$370,951**	**in 2022 dollars**

Indirect Annual Costs

Parameter	Equation	Cost
Overhead	= 60% of sum of operator, supervisor, maintenance labor Plus maintenance materials	$35,347
Administrative Charges	= 2% of TCI	$82,766
Property Taxes	= 1% of TCI	$41,383
Insurance	= 1% of TCI	$41,383
Capital Recovery	= $CRF_{Adsorber}$ × (TCI - [(1.08 x CC x M_c) + (LR x M_c/CRR)] =	$323,915

Indirect Annual Costs (IAC) =		**$524,793**	**in 2022 dollars**

Recovered Solvent Credit/Disposal Costs

Disposal Cost

Parameter	Equation	Cost
VOC Disposal/Treatment Costs (*Disposal $_{cost}$*)	$= m_{voc} \times \theta_s \times D_{voc} \times E =$	$0

VOC Recovery Credit

Parameter	Equation	Cost
Annual Recovery Credit for Condensate (RC)	$= m_{voc} \times \theta_s \times P_{voc} \times E =$	$0

Total Annual Cost (TAC) =	**DAC + IAC + C + $Disposal_{Cost}$ - RC =**	**$895,744**	**in 2022 dollars**

Cost Effectiveness

Cost Effectiveness

Parameter	Equation	Cost	
Total Annual Cost =	TAC =	$895,744	per year in 2022 dollars
Annual Quantity of VOC Removed/Recovered =		69.7	tons/year
Cost Effectiveness =	Total Annual Cost (TAC) / Annual Quantity of VOC Removed/Recovered =	$12,861	per ton of pollutants removed/recovered in 2022 dollars

Table A: Typical Parameters for Selected Adsorption Isotherms[a]

Compound	Adsorption Temperature (°F)	Isotherm Parameters		Range of Isotherm[b] (psia)
		k	m	
Acetone	100	0.412	0.389	0.0001 - 0.05
Acrylonitrile	100	0.935	0.424	0.0001 - 0.015
Benzene	77	0.597	0.176	0.0001 - 0.05
Chlorobenzene	77	1.05	0.188	0.0001 - 0.01
Cyclohexane	100	0.505	0.210	0.0001 - 0.05
Dichloroethane	77	0.976	0.281	0.0001 - 0.04
m - Xylene	77	0.708	0.113	0.0001 - 0.001
Phenol	104	0.855	0.153	0.0001 - 0.03
Toluene	77	0.551	0.110	0.001 - 0.05
Trichloroethane	77	1.06	0.161	0.0001 - 0.04
Vinyl Chloride	100	0.2	0.477	0.0001 - 0.05

[a] Each isotherm is of the form w = kPm, where w is the equilibrium adsorptivity (lb adsorbated/lb adsorbant), P is the partial pressure of VOC in the gas stream (psia), and k and m are empirical parameters based on Calgon BPL carbon.

[b] Adsorptivity equation should not be extrapolated outside these ranges.

Table B: Typical Equipment Costs for Carbon Adsorber Canisters[a]

Canister Size (in pounds of activated carbon)	Maximum Flow Rate (cfm)	Canister Type	Cost with Virgin Carbon (in 2022 dollars)	Cost with Reactivated Carbon (in 2022 dollars)
140	500	Polyethylene	$1,505	-
140	500	Epoxy-Lined Steel	$2,309	-
170	300	Epoxy-Lined Steel	$2,278	-
180	100	Epoxy-Lined Steel	$3,344	$2,048
200	100	Epoxy-Lined Steel	$1,641	-
1,000	600	Epoxy-Lined Steel	$13,793	-
1,000	1,000	Epoxy-Lined Steel	$24,033	$14,629
2,000	2,000	Epoxy-Lined Steel	$39,707	$20,899
2,000	750	Carbon Steel	$45,977	$27,586
3,000	2,000	Epoxy-Lined Steel	$29,049	-
4,100	8,000	Polypropylene	$94,044	-
5,000	2,500	Carbon Steel	$89,028	$42,006
8,000	4,500	Carbon Steel	$137,931	$62,696
10,000	18,000	Polypropylene	$197,492	-

(a) Equipment costs based on 2018 data provided by Calgon Carbon Corporation and Carbtrol Corporation.

APPENDIX J. GHG CONTROL COST ANALYSIS

- Placeholder – Refer to original PSD application **Appendix J** contents

APPENDIX K. EMERGENCY ENGINE CONTROL COST ANALYSIS

- Placeholder – Refer to original PSD application **Appendix K** contents

APPENDIX L. HOT ROLLING MILL CONDENSABLE PM CONTROL COST ANALYSIS

- Placeholder – Refer to original PSD application **Appendix L** contents