DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

N601360292

FACILITY: CONTINENTAL ALUMINUM		**SRN / ID:** N6013
LOCATION: 29201 MILFORD RD, NEW HUDSON		**DISTRICT:** Warren
CITY: NEW HUDSON		**COUNTY:** OAKLAND
CONTACT: Mark Buchner , President		**ACTIVITY DATE:** 09/21/2021
STAFF: Iranna Konanahalli	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: FY 2021 SM CMS scheduled inspection of Continental Aluminum ("Continental"), an aluminum scrap recycling and remelting facility		
RESOLVED COMPLAINTS:		

Continental Aluminum (N6013)
29201 Milford Road
New Hudson, Michigan 48165-9741

NACIC Code: 331314 & SIC Code: 3341

Consent Order AQD No. 52-1 (AQD Division Chief terminated CO on February 27, 2007). Continental paid $33,000.00 settlement (Jan 24, 2002) and $15,000.00 stipulated penalty (Aug 11, 2005).

VNs: Recently, AQD issued Violation Notices dated February 5, 2013 (for failure to comply with NESHAP / MACT RRR / MACT 3R, 40 CFR, Part 63, Subpart RRR [Secondary Aluminum Production NESHAP]), September 10, 2014 (for failure to operate Rotary Furnace [RO] lime feeder), July 27, 2015 (for routinely exceeding RV1 flux usage limit of 209.68 pounds of flux per ton of scrap charge (i.e. 10.48%) per NESHAP/MACT RRR, 40 CFR, Part 63, Subpart RRR and PTI No. 504-96F, FG-RV1, II.2), February 06, 2020 (for non-compliance with PM2.5 limit of 1.4 pounds of PM2.5 per hour and Appendix A COMS [PTI No. 504-F, FG-RV2, SC I.4. and SC IV.3] per October 2019 repeat stack test results (1.7 Vs limit of 1.4 pph PM2.5) as July 2019 stack test results (2.9 Vs limit of 1.4 pph PM2.5) showed non-compliance as well when flue and baghouse stack emissions are combined. Based upon Oct 2019 stack test results, RV2 production limit is 1.4/1.7 ≈ 0.82 fraction of the scrap material input during the stack test. i.e., Scrap feed limit = 17,674 lbs/hr* 0.824 = 14,555 lb/hr.

Rule 336.1901 VNs: Recently, AQD issued Rule 901 Odor Violation Notices (VNs) dated September 28, 2016 (Tyler Salamasick) and June 11, 2019 (Joseph Forth).

Permit-to-Install (PTI) No. 504-96F dated September 27, 2013. Unlike the previous permit, PTI No. 504-96F incorporated NESHAP / MACT 3R correctly.

PTI Application voids: PTI Nos. 504-96E (01/15/2009: This application was for replacement of RV1 burners, which is exempt from Rule 336.1201 (Permit-to-Install) pursuant to Rule 336.1285(2)(c)(iii)), and 504-96G (07/08/2015, withdrawn due to guaranteed denial) and 504-96H (06/22/2020, withdrawn and would perhaps be applied later along with big project). In interim, Continental will comply with PS1 for COMS and reduce production for RV1 as stated elsewhere.

PTI voids: PTI Nos. 504-96 (10/08/1997), 504-96A (12/20/2001), 504-96B (10/06/2003) 504-96C (10/27/2006) and 504-96D (09/27/2013).

PTI Revisions (recent): PTI No. 504-96D dated October 27, 2006 ➔ PTI No. 504-96F dated September 27, 2013, as result of the February 05, 2013, NESHAP / MACT 3R violation notice (VN) and Continental's desire to change production limits. Further PTI revision was thought to be required to revise flux rate (x-hour block average & pounds of flux per ton of feed) for RV1 based upon additional stack testing for PTI and MACT 3R parameters because Continental was unable to comply with RV1 flux rate limits (PTI No. 504-96F, FG-RV1, II.2). AQD denied PTI modification (PTI No. 504-96F ➔ PTI No. 504-96G) to change flux rate averaging method (time and / or units) (3-hour maximum flux: pounds per ton of feed ➔ pounds per hour without considering feed) and, consequently, Continental withdrew the PTI application (PTI No. 504-96G). Besides, as stated above, AQD issued July 27, 2015, VN. At any rate, Continental was able to develop a software solution that warns an operator an amount of flux that can be added without violating flux limit (RV1: 10.48%) of the permit. While the continuous process RV1 had flux exceedance issue, the batch process RO had no such flux issue as operators could decide an amount of flux that was allowable in a batch in question. Obviously, continuous process RV1 flux rate is dynamic (transient) unlike RO, which is a batch process (≈3-hour batch). Although materials addition amounts and their proportions (fractions or ratios) can be easily controlled in a batch process such as RO, Continental installed a similar software for RO that instructs an operator how much more flux can be added to the batch such that flux addition is in compliance with RO's 18.9% flux limit (379 pounds of flux per ton of RO feed or charge). The flux limits were established based upon Sep 2013 stack tests. Due to exceeding PM2.5 emission limit based upon 2019 stack test and resulting limiting of production limit to 82% of stack test production (Scrap feed limit = 17,674 lbs/hr * 0.824 = 14,555 lb/hr), Continental may revise PTI No. 504-96F. Please note Continental conducted D/F (July 2019) test at different feed rate:14475.7 lb/hr feed. One of the purposes of the PTI revision is to increase total RV furnaces (RV1 + RV2) annual production limit.

Subject to (Existing < Feb 11, 1999): Area Source NESHAP / MACT RRR, 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production; Final Rule (Page 15690, Federal Register / Vol. 65, No. 57 / Thursday, March 23, 2000 / Rules and Regulations / Final rule). Continental operates Group 1 furnaces (RV1, RV2 & RO) with dirty (paints, oils, etc.) charge & reactive (agitation by recirculating molten metal) fluxing and the furnaces are NOT Group 2 furnaces with only clean charge. Elemental chlorine is not used anymore as it is prohibited by the revised permit (PTI No. 504-96B ➔ PTI No. 504-96C), including subsequent revisions, based upon the June 2002 stack test that showed chlorine limit exceedance.

NESHAP / MACT RRR Amendments: National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production, Page 57513 Federal Register /Vol. 70, No. 190 /Monday, October 3, 2005 /Rules and Regulations /Direct final rule; amendments

NESHAP / MACT RRR Amendments: National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production, Page 56700 Federal Register / Vol. 80, No. 181 / Friday, September 18, 2015 / Rules and Regulations / Final rule. Effective date: September 18, 2015. These amendments will improve the monitoring, compliance and implementation of the rule. This action finalizes residual risk and technology review.

NESHAP / MACT RRR Amendments: National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production, Page 38085, Federal Register /Vol. 81, No. 113 /Monday, June 13, 2016 /Rules and Regulations / Direct final rule. Effective on September 12, 2016. This direct final rule amends the final rule that was published in the Federal Register on September 18, 2015, by correcting inadvertent errors, clarifying rule requirements for initial performance tests and submittal of malfunction reports, providing an additional option for new round top furnaces to account for unmeasured emissions during compliance testing, and clarifying what constitutes a change in furnace operating mode.

The commonly emitted HAPs are: HAP organics, inorganic HAPs (hydrogen chloride, hydrogen fluoride, and chlorine), and particulate HAP metals. Some of these pollutants, including 2,3,7,8- tetrachlorodibenzo-p-dioxin.

Not subject to ROP: Exemption of Certain Area Sources (MACT RRR) From Title V Operating Permit Programs; Final Rule, Page 75320 Federal Register / Vol. 70, No. 242 / Monday, December 19, 2005 / Rules and Regulations / Final Rule. US EPA exempted permanently five (5) categories of non-major (aka area) NESHAP / MACT sources from Title V operating permit requirements. Consistent with Clean Air Act, US EPA determined that Title V operating permit requirements are infeasible, impractical, or unnecessarily burdensome on the five source categories (dry cleaners [NESHAP / MACT M], halogenated solvent degreasers [NESHAP / MACT T], chrome electroplaters [NESHAP / MACT N], ethylene oxide (EO) sterilizers [NESHAP / MACT O], and secondary aluminum smelters RRR). However, secondary lead smelting plants [NESHAP / MACT X] are not exempt.

Fee: Subject to Area Source NESHAP / MACT 3R Cat III fee. On February 25, 2011, Continental paid $4,756.50 (Invoice No. 674489) as Category I source as AQD misclassified Continental's fee category; AQD refunded Cat I fee keeping $250 for Cat III.

Recent stack tests: September 24-26, 2013 (RO [Baghouse under two conditions: Condiltion1 - max. flux and Conditon2 - max. temperature & minimum required lime] and RV1 (sidewell Baghouse)), and June 12-13, 2014 (natural gas fired RV1 combustion / hearth stack – uncontrolled, i.e., no baghouse) stack tests. 2013-14 performance tests were required by PTI No. 504-96F (PM, HCl, HF, D/F) and NESHAP / MACT 3R (dioxin / furan or D/F). Aug 2003 D/F test was inadequate (as cited in Feb 05, 2013 VN) to satisfy MACT 3R. Both RO and RV1 were tested; RV2 on long-term idle requiring substantial repairs and hence not tested in September 2013; however, Continental performed stack test on RV2 about July 8-10 (D/F, HCl, HF, PM, etc.) & October 29-30 (repeat test for PM only), 2019. Furthermore, Continental must perform Field Performance Audit (FPA) on RV2 opacity monitor (COMS) according to PS1. In October 29-30, 2019 (1.7 Vs limit of 1.4 pph PM2.5), Continental conducted

repeat stack test as July 2019 (2.9 Vs limit of 1.4 pph PM2.5) showed non-compliance. Since both July and October 2019 stack tests showed non-compliance, when flue and baghouse stack emissions are combined, RV2 production limit is 1.4/1.7 ≈ 0.82 fraction of the scrap material input during the stack test when flue and baghouse stack emissions are combined. Based upon Oct 2019 stack test results, RV2 production limit is 1.4/1.7 ≈ 0.824 fraction of the scrap material input during the stack test. i.e., Scrap feed limit = 17,674 lbs/hr* 0.824 = 14,555 lb/hr. It may be noted that while July 2019 test feed rate was 14,476 (D/F), the October 2019 (PM) test feed rate was 17,674, both in pounds of scrap per hour. Since the PM2.5 test was repeated in October 2019, 17,674 lbs/hr was chosen.

On September 15 & 21, 2021, I conducted an annual level-2 **FY 2021 SM CMS scheduled** inspection of Continental Aluminum ("Continental"), an aluminum scrap recycling and remelting facility, located at 29201 Milford Road, New Hudson, Michigan 48165-9741. The inspection was conducted to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994, PA 451; Michigan Department of Environment, Great Lakes and Energy, Air Quality Division (EGLE-AQD) administrative rules; Area Source NESHAP / MACT RRR; and the permit (PTI No. 504-96F).

During the inspection, Mr. Mark Buchner (Phone: 248-437-1001-ext. 5102; Cell: 248-379-7290; Fax: 248-437-8885; E-mail: mBuchner@ContAlum.com or mBuchner@MetalExchangeCorp.com), President (mostly in absentia), and Ms. Courtney Boc (Phone: 248-437-1001-ext. 5120; Cell: 248-977-7630; Fax: 248-437-8885; E-mail: cBoc@ContAlum.com or cBoc@MetalExchangeCorp.com), Quality & EHS Manager (mostly via phone), and Mr. Konrad Makaro (Phone: 248-437-1001-ext. 5110; Cell: 248-379-7306; Fax: 248-437-8885; E-mail: cMakaro@ContAlum.com or cMakaro@MetalExchangeCorp.com), Production Manager, assisted me.

On July 10, 2019, when RV2 stack tests per the permit (PTI No. 504-96F dated September 27, 2013) and NESHAP / MACT 3R were being performed as a trial operation of RV2 started about March 2019, US EPA inspectors, Ms. Marie St. Peter (Phone: 312-886+4746; Fax: 312-353-8289; E-mail: StPeter.Marie@EPA.gov; Mail Code: AE-17J), Environmental Engineer, and Ms. Sarah Clark (Phone: 312-886+9733; Fax: 312-353-8289; E-mail: Clark.Sarah@EPA.gov, Environmental Engineer Mail Code: AE-18J), both at US EPA Region 5, 77 W. Jackson Blvd, accompanied me for the FY 2019 inspection.

Continental's New Hudson facility operates two reverberatory sidewell furnaces (RV1-Deox & RV2-Alloy; RV2 – previously, long-term idled and in serious disrepair; however, upon completing repairs, Continental started trial operation in 2019 and conducted stack tests in July and October 2019) and one rotary furnace (RO). While RV is a continuous process, RO is a batch process (about 3-4 hours per batch). A sidwell reverberatory furnace chamber (typically known as hearth) is an open sidewell. The configuration of the furnace is such that an arched passage connects the open sidewell (lime and carbon injected baghouse) and enclosed hearth (uncontrolled natural gas combustion). During normal operation molten aluminum fills hearth and sidewell at a level (liquid seal) that prevents any air or gas migration from the sidewell into the hearth. i.e., hearth's natural gas combustion

products, which are practically free of PM, do not comingle with up to 100% opacity sidewell emissions. Hearth, where flame is directed towards the bricks, is heated using two natural fired burners (each 10 MM BTU per hour, total 20 MM BTU per hour). The hearth is principal source of heat for melting aluminum scrap that is introduced into the sidewell. As metal cast continuously from the furnace, scrap is charged, using a shaker to feed slowly and practically continuously, in sidewell to maintain the molten aluminum level (and hence liquid seal) in the furnace and sidewell. Sidewell contains molten aluminum at temperature ≈1300 ºF and the scrap aluminum melts as it sinks into the molten metal producing visible emissions, which are captured by capture device and delivered to a lime injected baghouse. Reactive fluxing (not cover flux) of aluminum is performed in the sidewell. It is considered reactive fluxing because molten metal is pumped (and hence agitated) to transfer heat to sidewell. Incorrect interpretation of reactive flux was used in the previous permit that also incorporated into the permit MACT 3R incorrectly (PTI No. 504-96C & PTI No. 504-96D). An interlock is present to prevent operation of the pump when liquid level is not adequate. Unlike earlier years (2000s), gaseous (elemental or Cl2) chlorine is not used as flux as current permit prohibits its use. Instead, sodium aluminum tetra fluoride flux (or similar flux) is used. The scrap charge may be covered with a salt flux to reduce potential for oxidation especially when casting is interrupted. Pumping molten metal helps transfer heat from hearth, where natural gas furnace heats molten metal, to sidewell where scrap melts.

Aluminum Scrap Management

The facility operation consists of Aluminum Scrap Management (inspection, screening for radioactive materials), Raw Material Shredding, Rotary Furnace (RO) and Reverberatory Furnaces (RV1, which always runs and RV2, which is a backup furnace and about March 2019 trial operation started). Scrap inspection is to qualify, quantify, monitor, etc. level of non-aluminum contaminants in the scrap. Contaminants are also the cause of odor. Lab samples are taken for inspection and analysis. Ferrous metals are removed using magnets. Non-metallic fluffy material is removed using eddy currents. Various blends of Types 1, 2, etc. are used to limit volatiles. Scrap management is a part of odor control as well.

Centrifuges (2-in-1: One system with two centrifuges)

About February 2017, Continental installed one centrifuge system with two centrifuges to remove oil, water, non-Al material from turnings or chips, which contain oil due to machining. Due to centrifugal forces action, oil and water are separated from scrap. Oil and water are pumped to four (4: 2 installed in Feb 2017 plus 2 installed in Feb 2018) 1,000-gallon tanks. About 4,000 gallons of water and oil per week are collected and disposed of. Thus, the dewatered and de-oiled scrap is pneumatically conveyed to scrap bins (mostly RV1 feed / charge). Removal of oil has a potential to reduce odor and increase longevity of bags. Also, removal of water saves energy (sensible heat and latent heat of evaporation: nearly 1,000 BTU per pound of water = nearly 1 SCF of natural gas; ≈$5.00 per million BTU). Furthermore, small quantities (<< 1%) of ferrous materials are removed via magnetic separation.

February 2020: 165,000 pounds of water removed.

Rotary furnace (RO) – Lime and carbon injected baghouse (RO-BH2)

Rotary furnace (RO) consists of a refractory lined steel cylinder. Heat energy is supplied to the furnace by firing natural gas in a packaged burner (14 MM BTU per hour). The rotary furnace operates as batch process (about 3-4 hours) unlike RV1 / RV2. Once a desired temperature is reached, sodium aluminum tetra fluoride flux (or similar flux) is used. Flux is to remove impurities from molten aluminum. RO processes both Continental (RV1) dross and toll (other aluminum scrap facilities) dross to recover aluminum. Use of toll dross, recently (FY 2019), has been substantially reduced. **Dross** is waste material that still contains economically recoverable aluminum (5-15%). RO dross, which hardly contains aluminum (not economical to recover), is known as **salt cake** or **oxide slag**. Salt cake is disposed of in a landfill. RO is also used to process more dirty (higher volatiles) scrap.

Rotary Furnace (RO): RO is 14 MMBTU / hour natural gas fired furnace heater with maximum materials (scrap, dross, flux, etc.) allowance as determined by stack test (RO limit = 26,139 pounds of charge per cycle / batch based upon September 24-26, 2013 {RO [Baghouse under two conditions: Condiltion1 - max. flux and Conditon2 - max. temperature & minimum required lime]} stack tests). RO visible emissions are captured by a capture device and delivered to a lime injected baghouse. When RO door is closed all visible emissions are efficiently ducted to the RO baghouse. RO emissions are controlled by 45,000 SCFM high temperature bagahouse (RO BH-2: Nomex bags, air-to cloth ratio = 3:1). RO bags are shaken at the end of ≈3-hour batch; prior to next batch. Lime and activated carbon are injected into the bags to control acid gases and odor, respectively. The injection starts before the batch begins. Thorough cleaning of bags ended in December 2010 as per my recommendation. I explained to the company that 50% clean-up via shaking bags may be sufficient. Carbon and lime retained on the bags would help control odor and acid gases during the beginning of next batch. Continental, about 2015, installed electronic systems to prevent excessive shaking. RO produces molten aluminum for RV1 if the material is owned by Continental or sow product for toll processing.

Based upon the inspection, all visible emissions are captured using a capture device and ducted to RO baghouse (RO BH-2). During scrap aluminum charging period, natural gas firing is not done. Towards the end of RO batch, molten aluminum is transferred to preheated crucibles, whose tear weight is known. From the crucibles, upon skimming dross, molten aluminum is poured into reverberatory furnace (RV1). RO enhances throughput of RV1 as it adds molten aluminum to it. In addition, RO enables the plant to process high volatile (combustibles) aluminum scrap. End of an operating cycle, for example RO, is known as **tap / pour**.

When operating, based upon observed visible emissions (VE) near the RO capture device and high volatile content (RO up to 10% Vs RV1 up to 2%), RO may be predominant source of odor that is variable with time (transient). Initially when an ≈3-hour batch begins, most combustibles are burnt, odor may be intense.

Deox / Alloy

Deox is deoxidant product for steel mills. Although RV1 is known as Deox furnace, RV1 can make both alloy and deox products depending upon market demands.

Reverberatory Furnace 1 (RV1- De-ox) - Lime and carbon injected baghouse (RV1-BH3)

RV1 is a continuous process (casting) unlike RO. RV1 consists of two (2) natural gas fired burners of capacity 10 MMBTU per hour, each burner; total heat input of 20 MMBTU per hour. Entire natural gas combustion takes place at hearth. Flame is directed towards bricks. RV1 melts aluminum scrap, dross, etc. at a charge rate (pounds per hour, all materials including flux, scrap, dross, etc.) determined by the stack test (47,148 lbs. / 3-hr = 15,716 lbs. / hr. based upon September 24-26, 2013 {RO [Baghouse under two conditions: Condiltion1 - max. flux and Conditon2 - max. temperature & minimum required lime] and RV1 [sidewell Baghouse], and June 12-13, 2014 [natural gas fired RV1 combustion / hearth stack – uncontrolled, i.e., no baghouse]} Stack Tests). Like RO, RV1 is controlled by 45,000 SCFM high temperature baghouse (RV1-BH-3: woven polyester bags, air-to cloth ratio = 3:1). Lime and carbon are injected into the bags to control acid gases and odor, respectively. The bags are shaken to maintain pressure drop (ΔP) across the bags. Thorough cleaning of bags ended in December 2010 as per my recommendations. I explained to the company that 50% clean-up via shaking bags may be sufficient. Carbon and lime retained on the bags would help control odor and acid gases. Continental installed electronic systems to prevent excessive bags shaking. Natural gas combustion emissions from hearth are uncontrolled; i.e. no baghouse.

When operating, based upon the inspection, all visible emissions are captured using a capture device and ducted to RV1 baghouse.

Reverberatory Furnace 2 (RV2- Alloy – long-term idle, since March 2019 trial operation and stack testing performed in July & October 2019) – RV2-BH1

Reverberatory Furnace 2 (RV2- Alloy) was previously long-term idled and in disrepair; however, Continental about March 2019 started trial operation; also Continental performed required stack testing in July & October 2019. Neither lime nor carbon injection was taking place when RV2 was idle. As a matter of fact, RV2's lime injection system was converted to carbon injection system for RV1 and RO. However, upon starting trial operation, RV2 was equipped brand new lime and carbon feeder that also feeds carbon mixed with lime. RV2 consists of two (2) natural gas fired burners of capacity 10 MMBTU per hour, each burner. Total capacity is 20 MM BTU per hour. RV2 is controlled by 45,000 SCFM high temperature baghouse (RV2-BH-1: woven polyester bags, air-to cloth ratio = 3:1). Alloy (RV2) baghouse was, until 2019, equipped with Continuous Opacity Monitoring System (COMS / CEMS). COMS: Environmental Monitoring Service Model 1304 S/N 246. COMS met Performance Spec 1, 40 CFR, Part 60, Appendix B. Continental must submit EER per PTI No. 504-96B, SC 36(g) / PTI No. 504-96D, SC 2.15; RV2 is was idled since 2008 until 2019 when RV2 restarted on trial basis. Alloy baghouse (RV2-BH-1) is operating at this time on trial basis as the Alloy process (RV-2) restarted in March 2019 after being idled for over a decade. About February 2019, Continental purchased from Environmental Monitor Service, Inc. (Yalesville, CT 06492, Phone: 203-935-0102) and installed COMS (EMS-510; S/N: 1138; 40 CFR, Part 60, Appendix B, PS1; Invoice No. 10913; 12/03/201; $19,521.43)

After RV2 steady operation, Continental is required to conduct PTI and MACT 3R stack testing, which was performed about July 8-10 (2.9 Vs limit of 1.4 pph PM2.5) and October 29-30 (1.7 Vs limit of 1.4 pph PM2.5), 2019, and performance audit of COMS according to

PS1. Continental performed repeat stack test in October 29-30, 2020. Both stack tests showed non-compliance with 1.4 pounds of PM 2.5 per hour limit as stated above. Based upon Oct 2019 stack test results, RV2 production limit is 1.4/1.7 ≈ 0.82 fraction of the scrap material input during the stack test. i.e., Scrap feed limit = 17,674 lbs/hr* 0.824 = 14,555 lb/hr.

RV2 is mirror image identical to RV1.

Shredder – In series cyclone and baghouse

Shredder pulverizes large metal (Al) scrap into smaller pieces. Shredder is capable of processing 20,000 pounds of Al scrap per hour. One **magnetic separator** is present to take out ferrous metals. Garbage materials such as paper, plastic, etc. are taken out using **eddy current separator.** Shredder baghouse is only baghouse that uses pulse-jet mechanism for cleaning; rest use shaker mechanism for bag cleaning. These operations are a part of odor management and product quality. Large particles are captured by a cyclone which is operated in series with the shredder baghouse. The cyclone protects the bags from impact by large particles which have high momentum. Fine particles are, of course, captured by the baghouse. The shredder baghouse emissions are released to in-plant environment.

Bails are broken and containers / vessels are removed to prevent potential explosion. Non-conforming bails are separated by visual inspection. Bails are broken and placed on a conveyor to carry the materials to the shredder, which is equipped with cutters. After shredding, the material is conveyed to a **magnetic drum (magnetic separator)** to pull out ferrous materials. Ferrous and non-aluminum materials accounted for and refund is sought. The materials are transferred to a **shaker table** and large aluminum pieces are pulled out. The material is sent to a ring mill where more shredding takes place. Materials fall through grates resulting in separation of large pieces. Material is carried to a magnetic separator. **Eddy separator** is present to take out non-aluminum materials such as paper, plastics, etc. A **vibrating table** is used to separate fluff (loose dirt). In the end, scrap aluminum raw material that can be fed to the furnaces is obtained.

According to March 28, 2000, letter from Mr. William A. Wickers II to Ms. Lisa Scarpelli, Continental installed ring mill, eddy currents separator to remove non-metallic materials such as paper, plastics. In addition, one magnetic separator was installed.

In-plant emissions

Farr baghouse (cartridge filters), which was located near southeast corner of the building, used to control in-plant fugitive emissions until it was removed. The Farr baghouse was inadequate and did not have properly designed capture and ventilation system. It has been removed about 2012. Occasionally, visible emissions are observed from the building from salt cake handling; these visible emissions are confused with smoke. However, opacity readings showed it is in compliance with 20 % opacity limit (6-minute average)

NESHAP / MACT RRR Group 1

Concerning the MACT RRR, Group 1 furnaces include RO, RV1 and RV2 (idle and in serious disrepair but started trial operation in March 2019) because all furnaces process dirty charge with reactive fluxing. While Group 1 furnaces melt, hold, process dirty (paint, oil, lubricants, coatings, etc.) charge, also process clean charge with reactive fluxing. Group 2 furnaces process only clean charge with non-reactive fluxing or no fluxing. Continental uses flux for all its furnaces (RV1, RV2 & RO). However, elemental chlorine (Cl) flux is prohibited by the permit.

Baghouses

In summary, four process baghouses are present: one for Rotary (RO) Furnace, two for Reverberatory (RV1 Deox / RV2 Alloy) Furnaces, one for Shredder. RV2 Alloy baghouse is equipped with Continuous Opacity Monitoring System (COMS / CEMS). COMS is required to be certified w.r.t. PS1 upon restarting RV2 Alloy process. While activated carbon is injected into Rotary and RV1 Deox baghouses to control odor, lime is injected into these baghouses to control acid gases. All baghouses are cleaned using shaker mechanism except Shredder baghouse, which uses pulse-jet mechanism.

Unlike, previously, RV1 baghouse, RV2 Alloy baghouse was idle and in disrepair as RV2 furnace was idled; however, trial operation of RV2 started in March 2019. As stack test was completed in July & October 2019, Continental is allowed to operate RV2 on production basis provided production is limited to 0.82% of the stack test production or the permit is revised for PM2.5 limits.

Lime and carbon injection

Into the baghouses (RO-BH2, RV1-BH3, RV2-BH1-idle) lime injection is continuous. According to Rinehart's letter dated July 27, 2009, during the fourth quarter of 2009 (4Q2009), Continental engaged Mr. Bruce Begeson of Begeson Technologies to develop a practice of activated carbon injection into RO (BH-2) and RV1 (BH-3) baghouse systems.

Two lime injection (one each for RO & RV1) and one common carbon injection systems are present. Based upon the inspection, carbon injection system uses a mixture consisting of 50% carbon and 50% lime. The carbon injection system serves both RO and RV1 baghouses. RV2 lime injection system has been converted to one common (RO & RV1) carbon injection system. Per the inspection, 30-40 pounds per hour lime & carbon mixture (1:1 by mass) is injected; one half mixture into RO-BH2 and rest into RV1-BH3. New lime injection and carbon injection system was installed for RV2 upon start up in March 2019.

Lime injection system can be used to feed carbon with two components mixed together. Three (3) lime injection systems are present; one for each furnace (RV1, RV2 & RO). New lime injection system has been installed for RV1. RV2 is mostly operating on trial basis. Unlike RO, which often supplies molten metal to either RV1 or RV2, hardly both RV1 and RV2 are operating simultaneously.

Rotory Furnace Barrel is heated to about 1300 ºF using natural gas. Molten aluminum metal from RO is held in heated crucibles before being transferred to Deox furnace (RV1). Reverberatory furnace may act as Deox or Alloy furnace depending upon the product.

Deox product is used in steel mills. RV1 is used as an Alloy furnace as well as Deox furnace.

Shredded aluminum is fed to either RO or RV1 or RV2. While materials with less than 2% volatiles are fed to RV1 or RV2, RO can handle up to 10% volatiles. Volatiles means combustibles in the scrap. As stated before, RO is a batch process running 6-7 batches per day (24 hours). Due to higher volatile (non-metallic) content, RO is more likely to be a source of odor. Because RO is batch process (about 3 hours per batch), odors tend to be transient if properly operated; highest intensity odor in the beginning of the batch and tapering towards the end.

On January 21, 2011, I discussed lowering exhaust gas temperature to the baghouses to improve effectiveness of carbon adsorption as lower temperature favors carbon adsorption because it is an exothermic process with release of kinetic energy of the molecules being adsorbed as heat. As a result of these discussions, Continental was staying below 250 ºF (PTI No. 504-96D, SC 3.9 limit: 400 ºF; this limit itself was incorrect per February 5, 2013, violation notice) at the inlet of bags. This 400 ºF temperature limit was incorrect per MACT 3R. The baghouse temperature limit must be based upon MACT 3R stack testing. September 24-26, 2013, stack tests (required per February 05, 2013 VN) established the maximum baghouse temperature limits for both RO (**RO T < 216 ºF**) and RV1 (**RV1 T < 182 ºF**) per MACT 3R. In addition, July (D/F, HCl, HF, etc.), October (retest for PM only) 2019, stack tests established the maximum baghouse temperature limit for RV2 (**RV2 T < 190 ºF**) per MACT 3R. The previous permit (before 2013) and inspections inadvertently and erroneously and, moreover, inconsistent with adsorption principles, allowing up to 400 ºF. These lower temperatures are now (after Sep 2013 & July 2019 stack tests) maintained and monitored. The lower exhaust gas temperature is helping adsorption (adsorption isotherm) of odors onto activated carbon cake on bag surfaces. Unlike absorption, which gas-liquid contact mass transfer operation, adsorption is gas-solid contact mass transfer operation. In adsorption, solute (contaminant) is transferred from gas phase to solid resulting in release of heat (exothermic). Hence, lower temperature favors higher adsorption rate. Removing heat of adsorption and maintaining lower temperatures favors adsorption.

Carbon and lime injection are started before a RO batch is started. Unlike RO, both RV1 and RV2 (previously idled) are continuous processes. RV2-alloy is equipped with its own lime and carbon injection system; lime injection system is used to inject carbon unlike RO and RV1. Each process (RO & RV1) has its own dedicated lime injection system; two systems in all; brand new lime feeder for RV1. However, one common carbon injection system serves both RO and RV1; RV2 lime injection system is converted to this common carbon injection system.

On September 15, 2011, I discussed operating baghouses at higher ΔP but still within permit limits. RO bags (BH-2) are shaken at the end of the batch. I asked Messrs. Rinehart and O'Neil to minimize bag-shaking at the end of RO batch by trial-and-error such that ΔP (BH-2) is on higher side of the permit limit (PTI No. 504-96D, SC 3.7 limit: 3.0 ≤ ΔP ≤ 10 inches WG). Since RV1 is a continuous (not batch) process, one press for shake may be sufficient to clean bags so that RV1 (BH-3) is always operated at higher ΔP; but still within the permit limit (PTI No. 504-96D, SC 1.8 limit: 2.25 ≤ ΔP ≤ 15.35 inches WG). About 2015, Continental installed an electronic system for each baghouse (RO & RV1) that

prevents excessive bag shaking. RV2 is equipped with the same PLC system upon start up in March 2019.

Public Health Assessment Petition

Via Dec 26, 2001 letter, Charter Township of Lyon and State Environmental Advocacy Organization petitioned Dr. Henry Falk, Asst. Administrator, US EPA Agency for Toxic Substances and Disease Registry (ATSDR) for public health assessment. At New Hudson, Continental started operation in 1998; moved from Detroit.

Michigan Dept. of Community Health Report

Exposure Investigations Report (Contact T. J. Bucholz 517-241-2112) states that MDCH concludes that Continental Aluminum poses no apparent public health hazard. MDCH conducted exposure investigation concerning toxic pollutants emitting from Continental from March 1 through May 31, 2004.

MDCH conducted an investigation under cooperative agreement with US Dept. of Health and Human Services, Agency for Toxic Substances and Disease Registry. MDCH (US EPA ID: MI 0001941699) conducted exposure investigation using Air Monitoring. MDCH investigated presence of acid aerosols, concentrations of air-borne metal particles, elevated mercury (Hg), volatile organic compounds (VOC). MDCH concluded, based upon exposure investigation of 2004 that the concentrations of chemicals in the ambient air were below health based comparison values. Hence, there was no apparent current (2004) public health hazard. Meteorological parameters were considered.

The November 15, 2005, letter from Ms. Christina Bush, Toxicologist, MDCH, to Mr. G. Vinson Hellwig, AQD Chief, stated that Continental Aluminum was not a significant source of mercury (Hg).

Consent Order 52-2001

AQD issued a Violation Notice dated March 20, 2000, for failure to install and operate lime injection system for RV-2 baghouse as indicated by HCl and Cl2 emissions and for submitting inaccurate information (RV1 & RV2 Rule 303) in permit application #504-96, which was subsequently revised to 504-96A.

On April 11, 2000, AQD-SEMI DO (Pinga) referred the odor violations (Rule 336.1901, PTI No. 504-96A, SC 13 & 14) for an escalated enforcement action.

Consent Order No. 52-2001 was finalized on December 20, 2001. PTI No. 504-96B was issued and made part of the consent order. PTI modification PTI No. 504-96B ➔ PTI No. 504-96C removed the required use of chlorine. The NESHAP / MACT RRR requirements were incorporated (March 23, 2000). During the permit review (PTI No. 504-96C), the MACT 3R requirements were not correctly incorporated.

Stipulated penalty

October 17, 2002, letter from AQD's Ron Pollom to Bill Altgibers, President of Continental, stated that Continental failed HCl limit (PTI No. 504-96B) per June 2002 sampling. HCl limit failure subjects the company to $3,000.00 per day stipulated penalty (CO No. 52-2001)

AQD Chief G. Vinson Hellwig terminated on February 1, 2007, Consent Order No. 52-2001 based upon Mr. J. David Rinehart's (President of Continental) letter dated February 2, 2007. The letter stated that Continental paid $33,000.00 (settlement) on January 24, 2002, $15,000.00 (stipulated penalty) on August 11, 2005, and that Continental complied with Paragraphs 11 thru 17.

PTI Modifications

As a result of inaccurate information (RV1 & RV2 and Rule 303) in permit application #504-96, PTI No. 504-96 was revised to PTI No. 504-96A.

PTI No. 504-96B was issued and made part of the consent order. PTI modification PTI No. 504-96B ➔ PTI No. 504-96C removed the required use of chlorine as flux as a result of failure to meet Cl emission limit of PTI No. 504-96B during June 12, 2002 stack test. The NESHAP / MACT RRR requirements were incorporated into PTI No. 504-96C; but not correctly.

The modification PTI No. 504-96C ➔ PTI No. 504-96D modified pressure drop (ΔP) for RV1 and RV2 from 3-10 inches WG to 2.25-15.35 inches WG based upon May 23-24, 2006, stack test (PM, HCl, HF). The PTI modification retained 3-10 inches pressure drop (ΔP) for Rotary Furnace (RO). All other conditions were retained during the PTI modification; i.e. only RV ΔP range was changed.

PTI Application No. 504-96E was voided on January 15, 2009.

The PTI modification PTI No. 504-96D dated October 27, 2006 ➔ PTI No. 504-96F dated September 27, 2013, was done as result of the February 05, 2013, NESHAP / MACT 3R violation notice (VN) and Continental's desire to change production limits. Further PTI revision was thought to be required to revise flux rate (x-hour block average and pounds of flux per ton of feed) for RV1 based upon additional stack testing for PTI and MACT 3R parameters. AQD denied this modification (PTI No. 504-96F ➔ PTI No. 504-96G) and Continental withdrew the application (PTI No. 504-96G).

As a result of February 05, 2013, VN and Continental's desire increase hourly and annual throughput for both RV1 and RO furnaces, Continental submitted this PTI mod application. Continental also proposed to build a holding furnace (Group 2 furnace under MACT RRR), which is referred to as EU-HOLDING (which is not installed as of this inspection). Continental requested numerous changes be made to the permit (PTI No. 504-96D), including changing/removing emission limits, changing material limits and operational limits, and adding the applicable MACT Subpart RRR requirements. Many of the requested operational changes such as baghouse inlet temperature, lime injection rate, feed rate, etc. would be determined by the required stack testing that was scheduled for the end of September 2013, and thereafter these parameters would be maintained in the facility OM&M plan. PTI No. 504-96F approved the production limits increases and clarified the meaning of charge (all materials charged to the furnace EXCEPT for molten aluminum).

Neither the district nor the permit section accepted the removal of HCl and HF limits. The limits are in the permit to ensure compliance with MI air toxics rules (R 225). PTI mod removed condition prohibiting reactive flux (per MACT 3R, reactive flux [due to agitation / pumping to transfer heat] has always been used and there was misunderstanding in the previous permit); however, elemental chlorine (Cl) gas is still prohibited. PTI mod increased PM limit for FG-ROTARY from 0.3 pound per ton to 0.4 pound per ton, consistent with the MACT 3R limit. PTI mod removed 10,000 pounds per hour charge production limit for FG-RV1; the charge limit would be determined by the required stack test. PTI mod increased charge limit to 54,000 tpy from 48,000 tpy for both RV1 and RV2 (Previously, RV2 on long term idle, but trial operation restarted in 2019). Since the MACT requires tracking ALL metal that is charged to the furnace (including molten metal), there would be 2 sets of recordkeeping. One counting all charge to the sidewell excluding molten metal (to show compliance with material limit of the permit), and another tracking all charge to the furnace (to show compliance with MACT RRR). AQD is allowing Continental to base emission calculations on just the “dirty” metal charged to the sidewell for several reasons. One, emissions from the melting process have already been counted for metal that was already melted in FG-ROTARY and is now being passed through FG-RV1 or FG-RV2. Secondly, AQD expects negligible emissions from clean molten charge that is added to FG-RV1 or FG-RV2, since the impurities in the scrap & flux have already been burned off in the rotary furnace. This should not result in any conflict with the MACT requirements. PTI mod removed 20,000 pounds per hour charge limit for FG-ROTARY; the charge limit would be determined by the required stack test.

PTI modification (PTI No. 504-96F ➔ PTI No. 504-96G) to change flux rate averaging (pounds per ton of feed ➔ pounds per hour) was denied as such averaging time must be based upon stack test and NESHAP / MACT 3R and the PTI application (PTI Application No. 504-96G) was withdrawn.

PTI modification (PTI No. 504-96 G ➔ PTI No. 504-96H) to remove COMS & PS1 requirements and to increase facility-wide annual production rate was withdrawn and will be applied at later date.

As result of July and October 2019 stack tests, as stated above, operating production is limited to 82 percent of stack test production. Continental is considering revising the permit. Tuesday, March 31, 2020, conference call, between AQD and David Kirby, discussed increasing total throughput for all furnaces put together (RV1 + RV2 + RO), extending stack height and revising stack dimensions for improved dispersion, increasing PM2.5 limit.

RV2-BH1 Baghouse COMS

Mr. Bill Algilbers, President of Continental, stated in his letter dated December 2, 2002, to Mr. Tom Maza of AQD that Continuous Opacity Monitoring System (COMS) installed on the exhaust stack of Reverberatory Furnace No. 2 or RV2 baghouse complied with Performance Specification 1 (40 CFR, Part 60, Appendix B, PS1). The annual COMS audit was required by PTI No. 504-96B, SC 36(g). Mr. Tom Maza’a letter dated December 4, 2002, states that AQD determined that Environmental Monitoring Services Model 1304 S/N 246 meets Performance Spec 1, 40 CFR, Part 60, Appendix B. Continental must submit Excess Emissions Report (EER) according to SC 36 (g), PTI No. 504-96B (PTI No. 504-96D, SC 2.15).

As stated before, about February 2019, Continental installed Environmental Monitoring Services S/L 1138. Invoice No. 10913 dated December 03, 2018, states that Factory Certification was performed for $1,300.00. Continental is yet to perform PS 1 Performance Audit as installed. See Feb 2019 VN.

Concerning COMS, Performance Spec 1 recertification and ongoing annual audits is required upon startup of RV2 (PTI No. 504-96F, FG-RV2, IV.3). As stated above, AQD issued February 06, 2020, VN for non-compliance with PTI No. 504-96F, Appendix A, COMS.

AQD also received along with the 2019 test report, revised Notice of Compliance Status (NOCS) per NESHAP / MACT 3R.

Based upon my September 15 & 21, 2021, the entire plant including RV1 & RV2 and RO are idled.

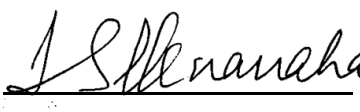
September 15, 2021: Only RO was operating at reduced capacity of 70 percent. RV1 & RV2 had not been operating since August 04. At this time, RO processed only either white dross (40 percent Al, skimming) or ingots to make saw product. Only saws were made; no ingot. Number of employees reduced from 60 to 14. Employees were kept busy doing miscellaneous projects like cleaning. All reverberatory furnaces (RV1 & RV2) were idled and were cool-to-touch.

September 21, 2021: All furnaces (RO, RV1 & RV2) were idled and were cool-to-touch.

No scrap or any material in the bins except one load of clean scrap on site due to contractual obligations. No Al scrap anywhere. The products (ingots and saws) are on site to be shipped. Only three (3) employees necessary to restart the furnaces are on payroll. On September 21, only one maintenance person working.

Conclusion

Currently Continental is in compliance with the permit and MACT 3R. Continental is idled for a foreseeable future. Continental may or may not restart.

NAME  DATE October 7, 2021 SUPERVISOR