UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

DATE: MAY 0 2 2019

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Trialco Inc., Chicago Heights, Illinois

FROM: Linda H. Rosen, Environmental Engineer
AECAB (IL/IN)

THRU: Nathan Frank, Section Chief
AECAB (IL/IN)

TO: File

BASIC INFORMATION

Facility Name: Trialco Inc.

Facility Location: 900 East Lincoln Highway, Chicago Heights,

Date of Inspection: March 7, 2019

EPA Inspector(s):
1. Linda H. Rosen, Environmental Engineer
2. Sarah Clark, Environmental Engineer

Other Attendees
1. Jeffrey S. Garcia, Environmental Health and Safety, Trialco, Inc.
2. Russel Renaud, Controller, Trialco, Inc.
3. Bill Larson, Plant Engineer, Trialco, Inc.
4. Jay Armstrong, President, Trialco, Inc. (intermittent)
5. Jim Dee, CFO, Trialco, Inc. (intermittent)

Contact Email Address: jdee@trialco.net

Purpose of Inspection: The purpose of this inspection was to inspect the facility relative to the National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production (Secondary Aluminum MACT).

Facility Type: The facility is a secondary aluminum production facility.

Arrival Time: 10:35 a.m.
Departure Time: 3:30 p.m.

Inspection Type:
☒ Unannounced Inspection
☐ Announced Inspection

OPENING CONFERENCE

☒ Credentials Presented
☒ CBI warning to facility provided

The following information was obtained verbally from Trialco representatives unless otherwise noted.

Process Description:

Trialco, Inc. (Trialco) smelts aluminum scrap to make aluminum alloys in the form of ingots and sows for about 200 customers. There are two reverbatory furnaces, no dryers and no afterburner. The main furnace (MF), installed in 2008, has a 300,000 pound (lb) capacity and has a throughput of 270,000 lb/day. The small furnace (SF) has a 100,000 lb capacity and has a throughput of 80,000 lb/day. The two furnaces operate the same except some specialty products require the SF.

The type of scrap processed includes soda cans, aluminum wheels and many other types, all with different chemistries. Prior to entering the process, the scrap is pre-processed by a scrap dealer and weighed. Trialco rejects oily scrap. Charging occurs in the front of the furnace, otherwise known as the charge well, where a well-walker pushes scrap down. The facility does not charge any scrap or flux until the molten metal level is over the archway; they achieve this condition by melting clean sows in the hearth.

The average time for charging and melting is 10 hours, although this duration varies depending on how much material is left from the previous batch. While the facility generally does not charge the furnaces and pour at the same time, sometimes they do charge while pouring which is called "puddle and pour." Pouring can last 8 to 16 hours depending on how much is poured. There is a hood over the charge well to capture emissions. The furnaces are heated through natural gas burners and the latent heat of the melted metal. The eutectic mixture has a melting point of about 1200 degrees Fahrenheit (°F).

The flux is added during charging. The fluxes clean the aluminum by separating out the impurities, such as magnesium, lithium, sodium and calcium, and result in the formation of dross on the surface. The facility uses gaseous fluxes of chlorine (Cl_2) and nitrogen (N_2) and solid fluxes including pot ash, which is a salt 50/50 mixture of potassium chloride (KCl) and sodium chloride (NaCl), Amcor A-103-2, which contains sodium aluminum flouride, and Amcor A-111,

which contains sodium fluorosilicate. The amount of flux added "by eye;" Trialco does not record the flux added except they do record the weight of the bottles of chlorine gas flux. At 1300°F to 1350°F, they introduce the gas flux at the base of the pump. At a certain point in the melting, Trialco analyzes the chemistry of the mix. Iron content and silica content is corrected by putting in different types of aluminum. Trialco skims off the dross and sends it to another facility for further processing.

There are three preheat ovens which are basically boxes with flames. These are used to preheat the sows or wet scrap before putting into the hearth. The preheat ovens are exhausted to the baghouse system. The oven temperature is about 400°F.

Each furnace has its own baghouse to which it primarily routes. The SF exhaust generally routes to the 60,000 cubic foot per minute (cfm) Wheelabrator shaker style baghouse and the MF generally routes to the 70,000 cfm ETA pulse jet baghouse. Although it is uncommon to switch baghouse, both furnaces are capable of routing to either baghouse.

The baghouses are injected with lime and ammonia and each equipped with a baghouse leak detection system (BLDS). The inlet temperature and the differential pressure across the baghouse are both monitored.

Staff Interview: The facility is privately owned and employees about 60 employees. The facility operates 365 days per year, 24 hours per day, 7 days per week. There are generally no scheduled shutdowns except about every 4-5 years, the reverbatory furnace needs to be rebricked which takes about 6 weeks.

The facility does not take scrap from individuals. The owner and president do all the purchasing. The facility did not know whether there were any purchase contracts. The quantity of secondary aluminum produced is about 20-30 percent less than the quantity of material input. The amount of scrap charged is tracked. Production is tracked in pounds shipped. Approximately 88-96 million pounds were shipped in 2018. In February 2019, the average daily production was 170,000 pounds for the MF and 93,000 pounds for the SF.

The facility implemented a new design on the MF last year. The old design had a second door to charge sows but now there is only one door. The small furnace still has two doors. The new design is more fuel efficient by reducing heat leakage.

On the day of the inspection, the ETA baghouse was down for a rebuild. It was on its fourth day of a five-day shutdown to replace the degraded spark arrester as well as numerous bags in the baghouse. Normally, the maximum time a baghouse would be down for maintenance (and both furnaces would be controlled by one baghouse) is 8 hours, during which time the facility would pour product or charge pure-aluminum into the hearth.

The lime feeder operates continuously, and the lime feeder rate is set so that the baghouse waste meets landfill acceptance requirements. They did not know the landfill criteria offhand. They said that the lime feeder experiences blockages which they correct as soon as they can. They know there is a blockage when the lime bag sits on top of the hopper too long. For instance,

since the lime feeder runs 24 hours per day even when pouring, a 200-pound bag should empty in three days, but if the bag sits there longer, that is indicative of a blockage. Blockages happen frequently in the summer, about every couple of weeks. The baghouses share the same lime hopper feeder. Trialco ran at maximum lime injection during their last stack testing. They said that the lime feed rate and bag weight are recorded.

Trialco stated that the BLDS alarm does not sound often. The system is recalibrated every six months by an outside company. The inlet temperature to the baghouse is monitored on both baghouses but there is no alarm. They are not aware of a temperature limit on the inlet baghouse. The temperature is usually about 120°F with spikes. They use damper air on the new baghouse only. The dampers on the new baghouse open automatically at the temperature setpoint of about 400°F in order to protect the bags. They check the differential pressure (dP) on the baghouse daily. When the dP reaches 8 or 9 inches of water, this indicates that the bags need to be replaced. There are no alarms at the facility except those associated with the BLDS.

The facility has not stack tested since 2010. The facility stated that Illinois EPA issued the permit without stack testing because the equipment had not changed at the facility. Environmental issues were previously handled by Jim Dee, the CFO, but now they use an outside consultant, Admiral Environmental Services.

In October 2013, the facility responded to an EPA Request for Information for which Katharina Bellairs was the contact. In May 2017, Trialco responded to a letter from EPA's Superfund program.

TOUR INFORMATION

EPA toured the facility: Yes

Data Collected and Observations:

We observed the product storage area. Photo 1 shows solid flux in totes and photo 2 shows final product. Every row was contained a different aluminum alloy varying in their content of silicon, copper, nickel, etc. We observed the cooling area for the final product (photo 3), the sows (photo 4), and aluminum fluoride flux (photo 5) which removes manganese. We observed the scrap area inside the building, which included various types of scrap, including aluminum punchings and extrusions (photos 6-8),copper aluminum radiators (photo 9), aluminum chips which were clean to the touch with no noticeable oil (photo 10), and steering wheels.

We observed the SF, including the charge well, pump and hood (photos 11 and 12). There is a molten melt pump which mixes at 20,000 lb/min. Cl_2 and N_2 fluxes are injected through a pipe at the base of the pump, and the flux rate is manually adjusted with a needle valve located near the pump. Photo 13 shows the valves and piping for adjusting the flux injections. Temperature readings are taken at the top roof and at the bottom of the furnace. Photo 14 shows the thermocouple, pump and injection tube. The pump cannot operate until the metal is above the archway due to flames, and the gaseous flux cannot be injected without the pump operating. The

doors open to bring the pump in and out. The door was slightly open during the inspection. Photo 15 shows the hood (i.e., doors) on the pump well.

Between the SF and MF, the facility has digital readouts which contained information pertaining to the furnace operating conditions (photo 16). By measuring the total chlorine in the tanks, the facility estimates total, 15-minute, and 60-minute chlorine usage, which is digitally displayed. They also measure and display the ammonia usage, roof temperature, and furnace temperature. Printed boards on either side of the digital readouts were illegible (solid black), but we were told that they contained additional furnace operating conditions for the MF, to the right, and the SF, to the left. Photo 17 shows the hearth door on the SF. The facility opened the hearth to add a preheated sow (photo 18). Photo 19 shows the ventilation system for the SF. Next, we saw the hopper for charging scrap to the SF (photo 20), the SF charge well (photo 21), the SF well-walker which was not operating (photo 22), the pouring area for the sows (photo 23), and the ductwork to the baghouse (photo 24).

The preheat ovens (photos 25, 26 and 27) were also ducted to the baghouse. The facility opened one of the preheat ovens for us during the inspection.

Next, we moved to the MF and observed the hearth (on the left) and well-walker positioned by the charge well (on the right) (photo 28). The facility opened the hearth of the MF where we observed clean sows positioned inside (photo 29). We observed a hood over the hearth and ductwork. The facility showed us where dilution air is added to cool down the 1600°F gas. Photo 30 shows the flue to atmosphere. The facility was neither charging nor melting scrap at either furnace at the time of the inspection; instead, they were making heels from sows. We observed the maintenance hatch on the line from the MF to the baghouse (photo 31). We observed the charge well which had a hood and ductwork to the baghouse (photo 32). There was damaged ductwork on the line from the MF to the baghouse that occurred when a forklift hit the ductwork (photos 32-35). In photos 35 and 36, from left to right, the first duct originally connected to the hearth but was modified to connect to the charge well, the second duct is the original charge well duct, the third duct is the original pump well duct, and the last duct is a newer pump well duct. We were informed that the curtains are intended to help contain scrap; explosions happen occasionally when wet scrap or crushed automotive scrap with airbags are added to the furnace. We also observed the MF pump housing (photo 37), the MF pump (photo 38), and the MF pump well vent (photo 39). We observed the connection where the ducts from the MF hearth and MF charge and pump wells meet. Each duct has a damper such that air flow can be directed as needed; we were informed that the duct to the MF hearth is normally closed except during furnace cleaning, when charging does not occur (photos 40-42).

We observed the scrap scale (photo 43). The scale is not certified. The facility only uses certified scales for its products. The scrap is weighed by setting the hopper onto the scale. We walked behind the SF and observed the ductwork which has dampers for switching exhaust emissions from one baghouse to the other (photo 44).

Outside, we observed the lime feeder for the baghouse (photos 45-46). We observed the Wheelabrator shaker style baghouse (photo 47) and the ETA pulse jet baghouse. The ETA was down and the spark arrester was missing (photos 48 and 49). We observed the readout for the

chlorine flux scales (photo 50). We visited the baghouse electrical room in the ETA house and observed the computer process parameter display for both baghouses (photo 51). The differential pressure was zero for the ETA baghouse (which was down) and zero for the Wheelbrator baghouse. We were informed that the hoses that provide the differential pressure for the Wheelabrator baghouse were broken because they were hit by a crane the previous Tuesday; we later observed corresponding broken hoses (photos 52 and 53). Photo 54 shows the differential pressure gauges for the Wheelabrator baghouse registering about 6 inches of water column. The hoses were expected to be fixed the week after the inspection. The ammonia feed was turned off at the time of the inspection. According to the facility, the lime was flowing to the Wheelberator baghouse. However, the lime injection rate, the inlet temperature and the BLDS data could not be observed because this instrumentation was in the ETA house which was shutdown during the rebuild. The facility also said that the lime injection numbers on the computer monitor for the ETA baghouse (photo 51) were not accurate because the computer was showing 44.92 lbs of lime per hour even though the ETA was down.

We observed the scrap yard. There are many varieties of scrap (photos 55-61) including cans, car wheel rims, crushed automotive parts (which may contain the occasional airbag), siding (photo 61) and Teflon-coated materials. Photo 62 shows the new spark arrestor.

Photos and/or Videos: were taken during the inspection.

Field Measurements: were not taken during this inspection.

RECORDS REVIEW

1. We reviewed some of the flux safety data sheets (SDS). A-103-2 is a non-ferrous solid flux containing sodium aluminum fluoride (1-5 %). A-111 is a solid flux containing sodium nitrate (5%) and sodium fluorosilicate (15-30%). Both fluxes list hydrochloric acid and hydrofluoric acid as decomposition products.

CLOSING CONFERENCE

From the facility, Jeffrey Garcia, Bill Larson and Jimmy Dee were present. We showed them the photos we had taken. We told them we would likely send a Request for Information.

Requested Documents:

We received the following:

- Copy of an email pertaining to the 2013 Request for Information;
- Copy of the 2013 Request for Information response on a thumb drive;
- Diagram of the furnaces, hand-written by Jimmy Dee; and
- Diagram of the facility.

We requested the following:

- Photos/documentation of the BLDS, lime, ammonia, temperature, and dP readings after the ETA baghouse is brought online; and
- Photos of legible furnace labels.

Concerns:

- The amount of flux added is not being tracked;
- We could not read the monitoring parameters for the baghouse, such as pressure drop, inlet temperature, lime injection rate and ammonia injection rate due to the maintenance going on;
- The MACT requires a stack test for dioxin/furans every 5 years; and
- The furnace labels were not legible.

SIGNATURES

Report Author: _____ Date: 4/30/19

Section Chief: _____ Date: 5/2/19

APPENDICES AND ATTACHMENTS

1. Media Appendix

APPENDIX A: DIGITAL IMAGE LOG

1. Inspector Name: Sarah Clark	**2. Date(s) of Inspection:** March 7, 2019
3. Company/Facility Name: Trialco Inc.	**4. Street Address, City, State:** 900 East Lincoln Highway, Chicago Heights,
5. Number of Images: 62	**6. Archival Record Location:** Trialco, Inc., Chicago Heights, IL Inspection Photos, March 7, 2019

Image Number	File Name	Date and Time (incl. time zone and DST)	Latitude and Longitude	Description of Image
1	P3070001.JPG	3/7/2019 13:04	41.505808, -87.609667	Solid flux in totes
2	P3070002.JPG	3/7/2019 13:05	41.505808, -87.609663	Final product
3	P3070003.JPG	3/7/2019 13:07	41.505783, -87.609627	Cooling area for final product
4	P3070004.JPG	3/7/2019 13:08	41.505782, -87.609625	Product sows
5	P3070005.JPG	3/7/2019 13:08	41.50578, -87.609625	Aluminum fluoride flux
6	P3070006.JPG	3/7/2019 13:10	41.505773, -87.609622	Aluminum scrap
7	P3070007.JPG	3/7/2019 13:10	41.505773, -87.609622	Aluminum scrap
8	P3070008.JPG	3/7/2019 13:10	41.505773, -87.609622	Aluminum scrap
9	P3070009.JPG	3/7/2019 13:11	41.50577, -87.609622	Copper/aluminum radiators
10	P3070010.JPG	3/7/2019 13:13	41.505763, -87.60962	Aluminum chips
11	P3070011.JPG	3/7/2019 13:18	41.505753, -87.609617	SF
12	P3070012.JPG	3/7/2019 13:18	41.505753, -87.609617	SF
13	P3070013.JPG	3/7/2019 13:28	41.505755, -87.609598	SF valves and piping
14	P3070014.JPG	3/7/2019 13:29	41.505755, -87.609598	SF thermocouple, pump and injection tube
15	P3070015.JPG	3/7/2019 13:29	41.505755, -87.609598	SF pump well doors/hood

16	P3070016.JPG	3/7/2019 13:30	41.505753, -87.609595	Digital displays (chlorine, ammonia, temperature) and black boards
17	P3070017.JPG	3/7/2019 13:32	41.505745, -87.609595	Hearth door on SF
18	P3070018.JPG	3/7/2019 13:33	41.50571, -87.609583	SF Hearth opened
19	P3070019.JPG	3/7/2019 13:36	41.50571, -87.609583	Ventilation over SF
20	P3070020.JPG	3/7/2019 13:39	41.505677, -87.609495	SF hopper
21	P3070021.JPG	3/7/2019 13:40	41.505673, -87.609497	SF charge well
22	P3070022.JPG	3/7/2019 13:40	41.505673, -87.609497	SF well-walker
23	P3070023.JPG	3/7/2019 13:42	41.50566, -87.609488	Pouring area for sows
24	P3070024.JPG	3/7/2019 13:44	41.505502, -87.609512	Dcut to baghouse
25	P3070025.JPG	3/7/2019 13:49	41.505217, -87.609623	Preheat ovens ducted to baghouse
26	P3070026.JPG	3/7/2019 13:49	41.505217, -87.609623	Inside open preheater
27	P3070027.JPG	3/7/2019 13:50	41.505217, -87.609623	Preheaters
28	P3070028.JPG	3/7/2019 13:51	41.505213, -87.60963	MF, hearth and well-walker
29	P3070029.JPG	3/7/2019 13:52	41.505167, -87.609663	Open MF hearth
30	P3070030.JPG	3/7/2019 13:56	41.505167, -87.60968	MF Flue to atmosphere
31	P3070031.JPG	3/7/2019 14:00	41.505, -87.609444	Maintenance hatch on baghouse line from MF charge/pump wells
32	P3070032.JPG	3/7/2019 14:02	41.505045, -87.609628	MF Charge well with hood and damaged ductwork
33	P3070033.JPG	3/7/2019 14:03	41.505045, -87.609628	Damaged ductwork MF to baghouse
34	P3070034.JPG	3/7/2019 14:03	41.505045, -87.609625	Damaged ductwork MF to baghouse
35	P3070035.JPG	3/7/2019 14:05	41.505053, -87.609627	Damaged ductwork MF to baghouse; four ducts leading to the charge and pump wells
36	P3070036.JPG	3/7/2019 14:09	41.505053, -87.609627	MF charge well

37	P3070037.JPG	3/7/2019 14:10	41.505078, -87.609655	MF pump housing
38	P3070038.JPG	3/7/2019 14:11	41.505093, -87.609648	MF pump
39	P3070039.JPG	3/7/2019 14:13	41.505087, -87.609643	MF pump well vent
40	P3070040.JPG	3/7/2019 14:14	41.505, -87.609444	Duct connection/damper between MF hearth and charge/pump wells
41	P3070041.JPG	3/7/2019 14:15	41.505037, -87.609498	Duct connection/damper between MF hearth and charge/pump wells
42	P3070042.JPG	3/7/2019 14:15	41.505037, -87.609498	Duct connection/damper between MF hearth and charge/pump wells
43	P3070043.JPG	3/7/2019 14:19	41.504872, -87.609405	Scrap scale
44	P3070044.JPG	3/7/2019 14:20	41.504867, -87.609415	Back of SF ductwork
45	P3070045.JPG	3/7/2019 14:23	41.504852, -87.609148	Lime feeder to baghouse
46	P3070046.JPG	3/7/2019 14:23	41.504852, -87.609148	Lime feeder to baghouse
47	P3070047.JPG	3/7/2019 14:23	41.504853, -87.609142	Wheelabrator baghouse
48	P3070048.JPG	3/7/2019 14:24	41.504853, -87.609142	ETA baghouse
49	P3070049.JPG	3/7/2019 14:24	41.504853, -87.609142	ETA baghouse
50	P3070050.JPG	3/7/2019 14:25	41.504853, -87.608945	Chlorine flux scales readout
51	P3070051.JPG	3/7/2019 14:26	41.504853, -87.608945	Computer readout for baghouses
52	P3070052.JPG	3/7/2019 14:29	41.504863, -87.608535	Wheelabrator baghouse with broken dP hoses
53	P3070053.JPG	3/7/2019 14:29	41.504863, -87.608535	Wheelabrator baghouse broken dP hose
54	P3070054.JPG	3/7/2019 14:30	41.504847, -87.608568	dP gauges for Wheelabrator baghouse
55	P3070055.JPG	3/7/2019 14:41	41.504643, -87.60825	Outside scrap piles
56	P3070056.JPG	3/7/2019 14:41	41.504643, -87.60825	Outside scrap piles
57	P3070057.JPG	3/7/2019 14:42	41.504725, -87.608228	Outside scrap piles

58	P3070058.JPG	3/7/2019 14:42	41.504725, -87.608228	Outside scrap piles
59	P3070059.JPG	3/7/2019 14:43	41.504772, -87.607897	Outside scrap: crushed automotive
60	P3070060.JPG	3/7/2019 14:43	41.504803, -87.607897	Outside scrap: crushed automotive
61	P3070061.JPG	3/7/2019 14:46	41.504817, -87.607897	Outside scrap: aluminum siding
62	P3070062.JPG	3/7/2019 14:47	41.504817, -87.607897	New spark arrestor