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Garbis Simonian
Managing Director
Weston Aluminium Pty Ltd
Via email: gsimonian@westonal.com.au

RE: Response to issues raised by EPA regarding Pharmaceutical and Illicit drug waste processing (commercial scale) at Weston Aluminium (MOD 12)

Dear Garbis,

Previously, in a letter dated 29 August 2018, Todoroski Air Sciences (TAS) addressed issues related to the above trial, hereafter referred to as MOD12.

The EPA has responded in a letter to the Department of Planning and Environment dated 21 September 2018 seeking additional information. Each EPA point is responded to below.

EPA Point 1: - The EPA has requested information so it can make a proper assessment and issue its recommended conditions of approval.

Response to EPA Point 1. As previously indicated, not all of the information that EPA has requested exists.

EPA Point 2a: The specific information the EPA requests is set out below:

> *"…a. For each emission testing event undertaken during the permitted trial:*
> *i. The total number of batches processed;*
> *ii. The time each batch was processed; and*
> *iii. The proportion and weight of pharmaceutical waste, illicit waste and dross processed during each batch. "*

Response to EPA Point 2a. The relevant information in this regard was previously provided in a format commensurate with the test measurement data. The additional details and breakdown requested by EPA would not add any new, useful data for making a reasonable assessment. This is because the test measurements span more than one batch, and hence no meaningful information can be gleaned from the detailed breakdown requested by EPA. The available information is however provided as follows:

i. During the actual sampling on each testing occasion, eight batches were processed (four per rotary furnace), as set out in **Attachment 1**.
ii. Emissions testing occurred over a typical six to eight hour interval per monitoring event. Batch times were consistent with conventional dross processing. Refer to the batch times (in minutes) in **Attachment 1**. The total batch time was dictated by the dross being processed at the time, and not

by trial input processing demand. Thermal destruction of any one batch of trial inputs is rapid once the furnace and dross is at operating temperatures for waste processing.

iii. The proportion and weight of pharmaceutical waste, illicit waste and dross processed during each batch is set out in **Attachment 1**.

EPA Point 2b: The specific information the EPA requests is set out below:

> *"b. That Weston Aluminium provides the temperature profile and residence time of the furnace during each batch processed as was required by condition E2.4 of environment protection licence 6423 (the licence) as in-force at the time trial."*

Response to EPA Point 2b.

Temperature Profile: as has been explained previously, historical temperature profile data is not available. A profile of a full day of operation (dross processing) which shows the typical operating temperatures measured at the furnace exit, is provided at **Attachment 2**. The temperatures in the exit would be lower than in the furnace, but typically exceed 1000^{o}C as set out in the Weston Aluminium 2017 Monitoring & Verification Report.

Residence Time has been calculated as follows:

- A - Furnace volume = 9.5 m^3;
- B - Maximum charge volume (5t furnace at bulk density 1.9t/m3; and limited by position of furnace mouth) = 2.6 m^3;
- C - Residual furnace volume = A - B = 6.9 m^3;
- D - Maximum volumetric flow for burner at full fire = 3.1 m^3/s;
- E –Calculated minimum residence time = C/D = 2.2s.

EPA Point 3: The EPA raises the following new issue:

"Weston Aluminium could further support their position that dioxin and furan emissions are unlikely to change due to the proposal by providing the results of dioxin and furan stack testing conducted under non-trial scenarios."

Response to EPA Point 3. It is not Weston Aluminium's position that dioxin levels are unlikely to change at all, rather that the emissions are very low and any change would be so intangibly small as to be environmentally inconsequential and within the normal inherent variability that occurs in any process of this nature. Such normal, inherent variability is not considered to be a material change in the emissions.

An analysis of and the results of the dioxin testing conducted during the trial were provided to EPA in the TAS letters dated 11 April and 21 September 2018 (see **Attachment 3** and refer to the graph in the bottom right corner for dioxin emissions).

Given the information provided to date, it is not considered reasonable for EPA to raise new issues in regard to potential dioxin issues in this case. For example it has been set out that:

1. Dioxin levels during the trial were:

   a. less than 10% of the regulatory limit. (The specific values are 0.0012, 0.0016, 0.0053 and 0.0008 ng/m^3, equating to 1.2%, 1.6%, 5.3% and 0.8% respectively of the 0.1 ng/m^3 limit, and approx. 2% of the limit on average);
   b. close to the limit of detectability/ reliability in the measurement per the test method (and variable by a factor of almost 7, which is normal when sampling emissions that are at such very low levels, close to the limit of accurate measurability);
   c. so low that even a large relative change in the average or maximum levels, such as doubling the level would be inconsequential;
2. The AECOM modelling indicated no possible issue of dioxin impact.
3. The analysis previously presented shows there is no risk of any material change in the dioxin emissions due to the nature of the existing furnace and the proposed operation, specifically:
   a. the furnace would inherently destroy such substances, and they cannot form in the furnace;
   b. the emissions rapidly cool, preventing de-novo dioxin formation; and,
   c. the above is evident as there is no material increase or tangible change in CO emission in the pre and post-trial monitoring data. CO is a good indicator of poor combustion and the potential for any VOC and dioxins to form. As there is no material change in the CO levels pre and post-trial, there is no reason to consider there would be any tangible change in dioxin emissions either.

Weston Aluminium does not consider that any further non-trial testing of dioxin emissions is warranted for reasons including;

1. The reasons above, and as it has already been reasonably established that the levels of dioxin emissions would be very low, would not materially differ from existing emissions, would not cause any harm, and will remain inherently very low due to the nature of the plant;
2. The levels would be so low that the test method cannot provide meaningfully precise or accurate data in regard to any change in emissions, and it is just as likely that there will be levels measured that are higher or lower by some very small degree relative to the levels measured during the trial. This would be primarily due to normal variability in the process, materials and between any separate measurements taken;
3. Even if the non-trial levels were say double or half the trial results, which in absolute relative terms may appear significant, the levels will still be too low to have any tangible effect on the environment;
4. The testing is expensive (approx. $10,000 per test).
5. Further testing is unlikely to be able to conclusively demonstrate anything beyond perhaps some normal variability in very low levels of emissions.
6. The testing does not relate to the actual emissions from MOD12 or any issue of potential environmental harm.
7. It unreasonably delays the approval process.

It is understood that it was also established long ago that dioxin emissions are not a significant consideration in regard to the emissions profile for the existing process, for example, no dioxin limit was imposed during licencing/ approval as it is not needed. This would be due to the fact that Weston Aluminium dross processing is a non-salt process.

The average dioxin levels measured during the trial would have an approximate 50-fold margin of compliance relative to acceptable levels of emission, i.e. the average levels are approximately 1/50th of the limit of 0.1 ng/m^3. In the context of this average factor of 50, and even a factor of 20 (based on the maximum level

measured) or a factor of up to ten, (double the maximum) as suggested by TAS previously, the EPA requests are not reasonable.

A requirement for a campaign comprising three annual tests whilst processing waste may be appropriate to confirm the trial results.

The above provides the requested information which can be reasonably provided. We trust that EPA will now finalise its suggested conditions of approval.

Please feel free to contact me directly to discuss or clarify any aspect of this report.

Yours faithfully,

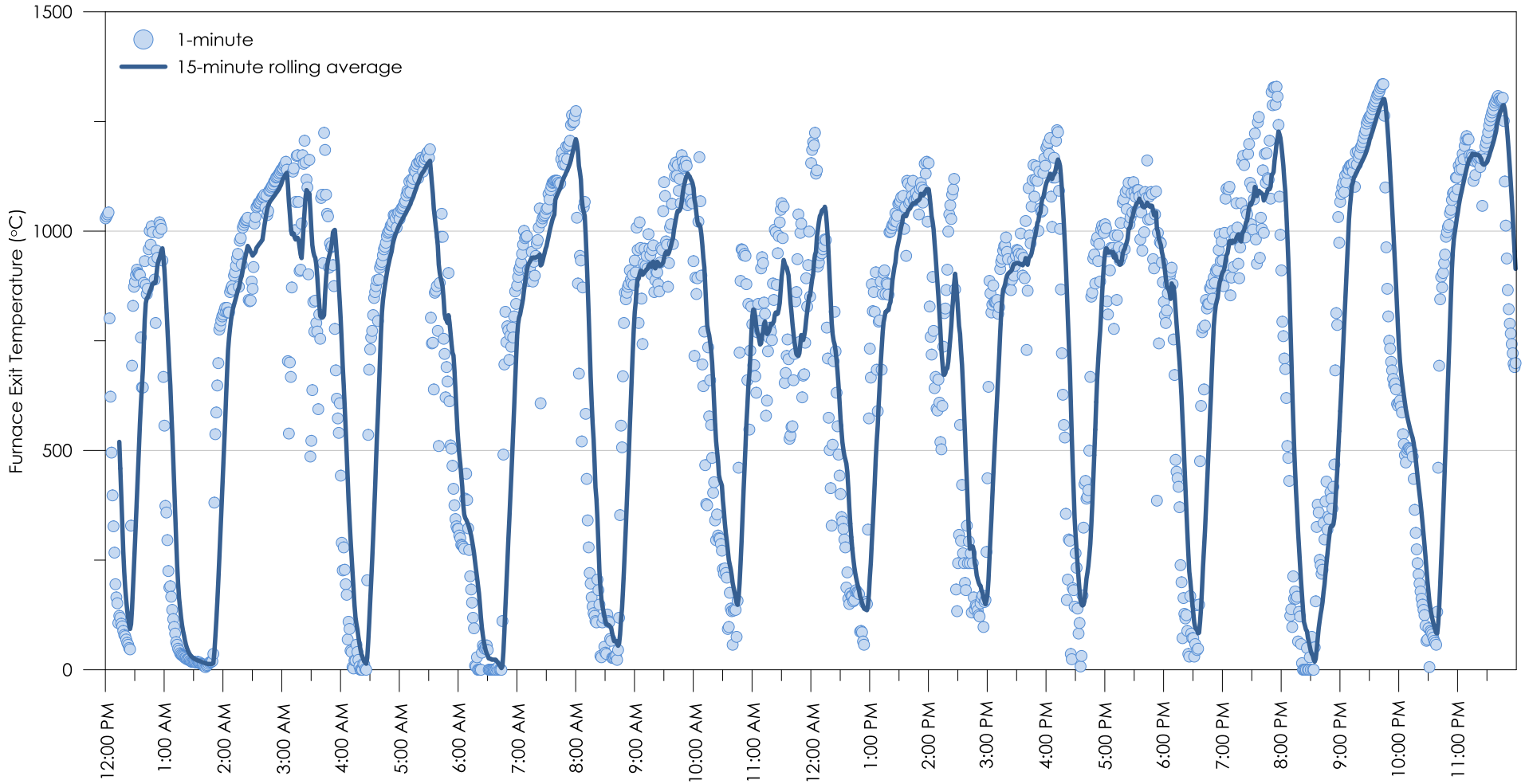
Todoroski Air Sciences

Aleks Todoroski

APPENDIX 1 – Charge time, mass and waste fraction of feed, per batch, per furnace and in total.

Furnace 1						Furnace 2						Total			
Charge #	Time (min)	Dross (t)	Pharma. (t)	Illicit (t)	Waste (%)	Charge #	Time (min)	Dross (t)	Pharma. (t)	Illicit (t)	Waste (%)	Dross (t)	Pharma. (t)	Illicit (t)	Waste (%)
16/12/2015															
18492-2	93	3.765	0.172	0	4.6	26102-2	70	3.815	0.181	0	4.7	**29.710**	**1.35**	**0.00**	**4.5**
18492-3	77	3.575	0.16	0	4.5	26102-3	73	3.905	0.185	0	4.7				
18492-4	85	3.48	0.152	0	4.4	26102-4	80	3.935	0.185	0	4.7				
18493-1	76	3.395	0.148	0	4.4	26103-1	104	3.84	0.165	0	4.3				
18/03/2016															
18641-2	97	3.85	0.168	0	4.4	26254-1	120	3.94	0.166	0	4.2	**31.015**	**1.37**	**0.00**	**4.4**
18641-3	89	3.82	0.171	0	4.5	26254-2	94	3.98	0.175	0	4.4				
18641-4	86	3.84	0.18	0	4.7	26254-3	97	3.89	0.168	0	4.3				
18642-1	92	3.88	0.164	0	4.2	26254-4	91	3.815	0.178	0	4.7				
30/06/2016															
18792-3	95	4.22	0.201	0	4.8	26431-3	109	4.175	0.188	0	4.5	**32.565**	**1.32**	**0.00**	**4.0**
18792-4	105	3.85	0.15	0	3.9	26431-4	102	4.195	0.145	0	3.5				
18793-1	165	3.92	0.171	0	4.4	26432-1	161	3.99	0.158	0	4.0				
18793-2	90	4.16	0.145	0	3.5	26432-2	91	4.055	0.16	0	3.9				
28/09/2016															
18953-3	100	4.39	0.184	0	4.2	26587-4	100	3.855	0.18	0	4.7	**32.055**	**1.44**	**0.02**	**4.5**
18953-4	100	4.035	0.19	0	4.7	26588-1	90	3.845	0.175	0	4.6				
18954-1	90	4.085	0.187	0	4.6	26588-2	100	3.77	0.156	0.015	4.5				
18954-2	98	4.125	0.201	0	4.9	26589-1	90	3.95	0.167	0	4.2				
8/06/2017															
19224-2	115	3.86	0.134	0	3.5	26872-3	95	4.33	0.198	0	4.6	**27.855**	**1.16**	**0.06**	**4.4**
19224-3	100	3.71	0.15	0	4.0	26872-4	100	4.255	0.17	0	4.0				
19225-1	110	3.76	0.14	0	3.7	26873-1	94	4.19	0.105	0.06	3.9				
19225-2	91	3.75	0.12	0	3.2	26873-2	77	4.25	0.142	0	3.3				

APPENDIX 2 – Furnace Exit Temperature (degrees centigrade) - Note: in-furnace temperature would be higher.



APPENDIX 3 – Graphical analysis of MOD 12 trial results