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Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Mr Nicholas Hall

By email: nicholas.hall@planning.nsw.gov.au

11 December 2017

Dear Mr Hall

**Proposed Modification to Weston Aluminium Dross Recycling Facility- DA 86-04-01 mod 12 and DA 10397 of 1995 Mod 10 – processing of illicit drugs and pharmaceutical wastes- Comments from the Environment Protection Authority (EPA)**

I refer to your email to the Environment Protection Authority (EPA) received 3 November 2017 inviting the EPA to update its submission following a response to submissions in relation to the Weston Aluminium Dross recycling facility modification application. The modification is applied for under DA 86-04-01 (Modification 12) and DA 10397 of 1995 (Modification 10) and relates to the processing of up to 5,000 tonnes of pharmaceutical waste and five tonnes of illicit drugs per annum, including associated packaging, in the existing rotary furnaces. The response to submissions was provided to the EPA with a letter from AECOM Australia Pty Ltd to the Department of Planning's Emma Barnett dated 3 November 2017.

On 9 November 2017, I advised that the EPA would not be able to update its submission until the final verification report for the recent trial of thermal treatment of pharmaceutical and illicit drugs is provided. The report, titled *Monitoring and Verification Report – Trial Destruction of Pharmaceutical & Illicit Drug Wastes* (the verification report) was received by the EPA on 10 November 2017. The results of this trial, as well as the information provided in the response to submissions, have been considered in updating the EPA's submission on the proposed modification.

The EPA's submission on the Environmental Assessment raised the following issues:

## HAZARDOUS SUBSTANCES AND WASTE

1. **Details of the illicit drug waste and pharmaceutical waste trial need to be provided to demonstrate the assessment of the project is accurate.**

The Response to Submissions summarises the waste processing conditions during the trial. Pharmaceutical and drug exhibit wastes that were treated were variable in composition. The packaging material for all wastes was also thermally destroyed. Process conditions, consistent with conventional aluminium dross processing, were maintained within the design specifications.

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Stack monitoring was performed on five occasions and showed the effective control of emissions during the period of monitoring. The stack tests on 16 December 2015, 18 March 2016 and 30 June 2016 were conducted during the processing of pharmaceutical waste, while stack tests on 28 September 2016 and 8 June 2017 were conducted during the processing of pharmaceutical and illicit drug waste. Pharmaceutical waste processing is stated to occur for the full duration of each monitoring event, while the drug exhibit waste processing occurred during a part of the monitoring event.

Only 141 tonnes of pharmaceutical waste and 1.9 tonnes of illicit drug waste were received and treated during the trial, which is significantly less than the up to 1,000 and 200 tonnes respectively, that was originally proposed.

The findings of the trial are limited by:

- the small amount of both waste types processed;
- the lack of information on the type, amount, nature and composition of the wastes (including packaging) processed;
- the likely significant variability in pharmaceutical wastes and illicit drug wastes, compared to the relative likely limited variability within the wastes processed during the trial; and
- the lack of detailed information on feed rate, process procedure, and other variables associated with the trial.

Material sourcing constraints and consequent limited processing batches, resulted in a limited opportunity to optimise process efficiencies. Nevertheless, the above limitations result in a large uncertainty with respect to future and ongoing project emissions. This translates into uncertainty in potential Project impacts on human health and the environment.

The variability of waste material is addressed in the tightened limit and more comprehensive monitoring conditions recommended by the EPA in attachment 1.

**2. It is unclear how potential cumulative hazards and risk have been assessed.**

The Response to Submissions adequately addresses this issue.

The Response to Submissions notes that cumulative stack emissions including those from the proposed Weston Aluminium Medical Waste Thermal Processing Facility (SSD_7396) (Medical Waste Facility) have been addressed in the AQIA. In addition, as the modification has resulted in stack emissions at a similar or lower level than existing emissions, the scope for other cumulative impacts is stated as negligible.

**3. Changes to concurrent proposal may impact the assessment of potential cumulative impacts associated with the project.**

The Response to Submissions adequately addresses this issue.

Amendments to the assessment of impacts for the Pymore project and the Weston Aluminium Medical Waste Facility are unlikely to significantly change the assessment of impacts for the Project.

**4. The EA provides limited information on potential waste related impacts and the management of wastes generated by the project.**

The Response to Submissions adequately addresses this issue.

The Response to Submissions includes the facility's standard operating procedures relevant to the management of waste related impacts, and notes the measures implemented during the trial were demonstrated to be effective. The Response to Submissions also states the special requirements relating to clinical and related waste prescribed in clause 113 of the *Protection of the Environment*

*Operations (Waste) Regulation 2014* (Waste Regulation), such as those regarding the storage and handling of these wastes, will be complied with.

**5. The assessment of the project does not consider contingency measures or nonroutine conditions.**

The Response to Submissions adequately addresses this issue.

The proposal is to use existing infrastructure and the Response to Submissions refers to standard operating procedures that have been developed to manage the operation of the rotary furnaces and that are integral to the management of non-routine conditions. In addition, specific procedures were developed in consultation with DPE to manage the processing of the proposed materials as part of the trial program, including to address potential non-routine conditions.

**AIR QUALITY**

The EPA's submission identified additional information that would be required before it could recommend conditions of approval. These information gaps are partially addressed by the verification report.

Section 3.2 of the verification report summarises the particulars of the trial process conditions. Of note:

- Pharmaceutical waste, including packaging was quite variable, powders, drums, glass, plastics, liquids, etc;
- Illicit waste, including packaging was quite variable; powders, 'cutting agents', plastic, cardboard, etc.

The verification contends that "*stack monitoring events confirm that Weston Aluminium's emission control systems are effective at controlling emissions associated with the thermal destruction of waste inputs and their packaging".*

The verification report does not provide detailed analysis of the waste treated during stack testing events throughout the trial, such as quantity, type, rate, composition, variability. The trial feedstock is not compared to expected reasonable worst case operating scenario applicable to the proposed commercial scale operation. As such, the trial monitoring data does not robustly substantiate the contention that the emission control system is effective.

Further, the verification report does not provide the temperature profile and residence time of the furnace during each processing batch, as required by condition E2.4 of the Environment Protection Licence.

Table 1 of the verification report summarises emission test results for five rounds of air emission tests (stack tests) conducted during the trial.

- All test results were below the current Environment Protection Licence limits for the rotary furnace (stack 1), designed for secondary aluminium processing.
- All test results are reported at actual oxygen ($O_2$) /carbon dioxide ($CO_2$).
    - Test results show that $O_2$ is typically >20%
    - Test results show that $CO_2$ is typically <1%
    - Based on the above, the combustion flue is subject to significant dilution prior to the point of sampling, which will significantly reduce the reported emission concentrations. The efficacy of the emission controls is therefore difficult to quantify.
    - Reported carbon monoxide concentrations may indicate poor combustion efficiency. Poor combustion efficiency is of particular relevance where the rotary furnace is charged cold in the absence of a secondary combustion chamber.
- The stack emission reports for each Trial report the dioxin concentrations as an average over the monitoring period. THE EPA notes the 30 June 2016 Stack 1 Emissions Testing Report

(AECOM, 2 September 2016) incorrectly reports dioxin stack concentrations in $mg/m^3$ rather than in $ng/m^3$. Apart from this error all dioxin emission concentrations measured during the Trial monitoring events are well below the respective regulatory limit (of 0.1 $ng/m^3$).

Principal toxics and their precursors should be processed using best practice process design and emission control. Projects proposing to treat toxic precursors and/or variable waste streams must be benchmarks against best practice:

- POEO (Clean Air) Regulation Group 6 limits are typically representative of reasonably available control technology. A new facility/plant thermally treating waste should be able to achieve better than Group 6 emission limits, when benchmarked against best practice.
- Where it is proposed that existing plant thermally treat new waste streams, the EPA requires, at a minimum, Group 6 emission limits and accompanying reference conditions (with consideration given to project specific factors).

Table 1 (below) provides a summary of one round of emission testing, out of five rounds, collected throughout the trial period. All test results in the verification report are reported at actual (measured) $O_2$ levels, as is the current regulatory requirement for the plant due to its vintage. The EPA has adjusted the trial test results to applicable reference $O_2$ levels to enable comparison with Group 6 (reasonably achievable) emission standards. Table 1 indicates that the rotary furnace does not currently meet Group 6 emission standards.

**Table 1 – summary of trial monitoring results compared to Clean Air Regulation Group 6 limits.**

| **Pollutant** | **Trial Result - June 2017** ($mg/m^3$, dry, 273 K, 101.3 kPa) | **Trial Result - June 2017** ($mg/m^3$, dry, 273 K, 101.3 kPa, 11% $O_2$) | **Trial Result - June 2017** ($mg/m^3$, dry, 273 K, 101.3 kPa, 3% $O_2$) | **POEO (Clean Air) Regulation - Group 6 Limit** ($mg/m^3$, dry, 273 K, 101.3 kPa, 3% $O_2$) |
|---|---|---|---|---|
| Total solid particles | 8.7 | 218 | 392 | 50 |
| Chlorine | 11 | 275 | 495 | 200 |
| Sulfuric acid mist (as $SO_3$) | 1.6 | 40 | 72 | 100 |
| Hydrochloric acid | 7.7 | 193 | 347 | 100 |
| Type 1 and Type 2 substances (metals) | 0.071 | 1.8 | 3.2 | 1 |
| Oxides of nitrogen (as $NO_2$) | 12 | 300 | 540 | 350 |
| Carbon monoxide | 25 | 625 | 1125 | 125 |
| Dioxins[1] | 0.002 | 0.05 | 0.09 | 0.1 |
| Volatile organic compounds (as propane) | 0.35 | 9 | 16 | 40 |

1) Nanograms per cubic metre (ng/m3)

## RECOMMENDED CONDITIONS OF APPROVAL

If the Department of Planning and Environment approves the proposed Modification to Weston Aluminium Dross Recycling Facility for commercial scale thermal process pharmaceutical and illicit drug waste in the rotary furnace, approval should be subject to the conditions at Attachment 1. These conditions allow the processing of these wastes only if the plant can achieve air quality emissions consistent with Group 6 under the POEO (Clean Air) Regulation.

If you require any further information regarding this matter please contact Genevieve Lorang on (02) 4908 6809.

Yours Sincerely

**MITCHELL BENNETT**
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**Environment Protection Authority**

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Encl. Attachment 1- Recommended EPL conditions for EPA point 1

CC: Dr Craig Dalton, Hunter New England Population Health
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## Attachment 1: Recommended Conditions of Approval

1. Emissions from EPA point 1 must meet the emissions stipulated by Group 6 under the Protection of the Environment Operations (Clean Air) Regulation, 2010 – or as updated.

### 2. Concentration limits

For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

**Point 1**

| Pollutant | Units of measure | 100 percentile limit | Reference Conditions | Averaging Period[1] |
|---|---|---|---|---|
| Total solid particles | $mg/m^3$ | 20 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour |
| Chlorine | $mg/m^3$ | 200 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour |
| Sulfuric acid mist (as SO3) | $mg/m^3$ | 100 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour |
| Hydrogen chloride | $mg/m^3$ | 100 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour |
| Type 1 and Type 2 substances (metals) | $mg/m^3$ | 1 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour |
| Cadmium | $mg/m^3$ | 0.2 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour |
| Mercury | $mg/m^3$ | 0.2 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour |
| Oxides of nitrogen (as NO2) | $mg/m^3$ | 350 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour |
| Carbon monoxide | $mg/m^3$ | 125 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour rolling |
| Dioxins and furans | $ng/m^3$ | 0.1 | Dry, 273K, 101.3kPa, 11% $O_2$ | 1-hour |
| Volatile organic compounds (as propane) | $mg/m^3$ | 20 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour rolling |

| Pollutant | Units of measure | 100 percentile limit | Reference Conditions | Averaging Period[1] |
|---|---|---|---|---|
| Gaseous Fluoride | $mg/m^3$ | 2 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour |
| Cyanide | $mg/m^3$ | 0.5 | Dry, 273K, 101.3kPa, 3% $O_2$ | 1 hour |
| Polycyclic Aromatic Hydrocarbons (as benzo-a-pyrene) | $mg/m^3$ | TBD[2] | Dry, 273K, 101.3kPa, 3% $O_2$ | 1-hour |

Note 1 – 1 hour, or the minimum sampling period specified in the relevant test method, whichever is the greater

Note 2 – To be determined based on first two rounds of sampling which demonstrates compliance with all other limits in table above.

## 3. Monitoring and Recording Conditions

### Requirement to monitor concentration of pollutants discharged

For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

| Pollutant | Units of measure | Frequency | Sampling Method |
|---|---|---|---|
| Selection of sampling positions | - | - | TM-1 |
| Moisture | % | Bi-annual | TM-22 |
| Molecular weight of stack gases | g/g.mol | Bi-annual | TM-23 |
| Oxygen | % | Continuous | CEM-3 |
| Temperature | °C | Bi-annual | TM-2 |
| Velocity | m/s | Bi-annual | TM-2 |
| Volumetric flow rate | $m^3/s$ | Continuous | TM-2 and Special Method 1 |
| Total solid particles | $mg/m^3$ | Continuous | Special method 2 |
| Chlorine | $mg/m^3$ | Bi-annual | TM-7 |
| Sulfuric acid mist (as SO3) | $mg/m^3$ | Bi-annual | TM-3 |
| Hydrogen chloride | $mg/m^3$ | Continuous | Special methods 3 |
| Type 1 and Type 2 substances | $mg/m^3$ | Bi-annual | TM12, TM13 and TM14 |
| Cadmium | $mg/m^3$ | Bi-annual | TM12, TM13 and TM14 |
| Mercury | $mg/m^3$ | Bi-annual | TM12, TM13 and TM14 |

| Pollutant | Units of measure | Frequency | Sampling Method |
|---|---|---|---|
| Oxides of nitrogen (as NO2) | $mg/m^3$ | Continuous | CEM-2 |
| Carbon monoxide | $mg/m^3$ | Continuous | CEM-4 |
| Dioxins and furans | $mg/m^3$ | Bi-annual | TM18 |
| Volatile organic compounds (as n-propane) | $mg/m^3$ | Quarterly | TM-34 |
| Gaseous Fluoride | $mg/m^3$ | Continuous | Special Method 1 |
| Cyanide | $mg/m^3$ | Bi-annual | Special Method 4 |
| Polycyclic Aromatic Hydrocarbons (as benzo-a-pyrene) | $mg/m^3$ | Bi-annual | OM-6 |

Special Method 1: Method proposed by the licensee and agreed to in writing by the EPA.

Special Method 2: US-EPA PS-11 or an alternate method agreed to in writing by the EPA.

Special Method 3: US-EPA PS-18 or an alternate method agreed to in writing by the EPA.

Special Method 4: USEPA OTM-29.

## Special Conditions

4. By <date to be determined> and prior to the commencement of commercial scale pharmaceutical or illicit drug processing, or as otherwise agreed to in writing by the EPA, licensee and submit a monitoring quality assurance and quality control (QA/QC) plan to the EPA for approval. As a minimum, the plan must include:
    a. Monitoring instrumentation – demonstration that selected monitoring equipment is fit for purpose
    b. Monitoring commissioning plan
    c. Operational quality assurance and quality control plan
        i. Calibration and relative accuracy audit program
        ii. Maintenance program

    The QA/QC plan must consider applicable published guidance, including:

    d. US-EPA: quality assurance Procedures 1, 2, 3 and 6
    e. MCERTS: Performance standards and test procedures for continuous emissions monitoring systems

    Commercial scale thermal treatment of pharmaceutical and illicit drugs must not commence until all continuous emission monitoring systems required by the licence are commissioned and the EPA has approved the QA/QC plan.

5. Proof of performance – Discharge Point 1
    a. By <date to be determined> and prior to the commencement of commercial scale pharmaceutical or illicit drug processing, or as otherwise agreed to in writing by the EPA, licensee must submit a detailed report for EPA approval which:
        i. Details how the emissions from the rotary furnace, at Point 1, will comply with Protection of the Environment Operations (Clean Air) Regulation Group 6 emission limits and all emission limits specified for Point 1 in the licence.
        ii. Details the flow balance for all air streams directed to Point 1.

iii. If necessary, nominates and details all plant and pollution control upgrades required to comply with the emission limits specified in (i) above.
iv. Nominates timeframes for implementation of upgrades identified in (iii) above.

Commencement of commercial scale pharmaceutical or illicit drug processing must not occur prior to the EPA's approval of the report.

b. Within 14 months of commencement of commercial scale pharmaceutical or illicit drug processing, or as otherwise agreed to in writing by the EPA, licensee must submit a detailed report for EPA approval which:
   i. Demonstrates emissions from the rotary furnace, at Point 1, comply with Protection of the Environment Operations (Clean Air) Regulation Group 6 emission limits and all emission limits specified for Point 1 in the licence.
   ii. Includes all emission testing and monitoring undertaken for the 12 month period from commissioning. This must include, as a minimum, all monitoring and sampling results require for Point 1 for an annual period.
   iii. If emissions from Point 1 do not comply with limits specified in (i) above, nominates and details all plant and pollution control upgrades required to comply with the emission limits specified in (i) above.
   iv. Nominates timeframes for implementation of upgrades identified in (iii) above.