

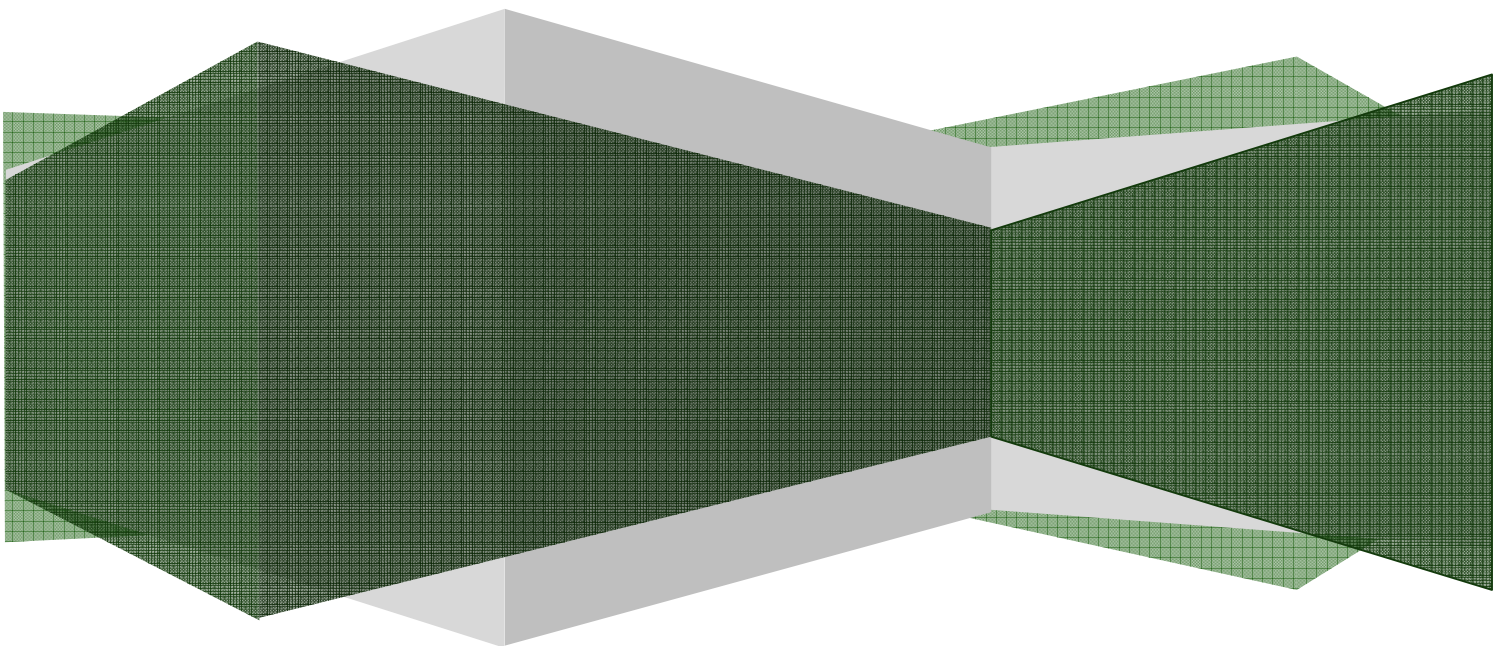


Weston Aluminium Pty Ltd

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Proposed SPL processing Trial Environmental Assessment

June 2011, Revision 0



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Executive Summary

Introduction

This Environmental Assessment (EA) supports an Application under Section 75W of the NSW Environmental Planning and Assessment Act 1979 from Weston Aluminium Pty Limited (Weston Aluminium) to modify its existing Development Consents (DA-86-04-01-Mod 5 and DA 10397 1995 Mod 3) to undertake a Spent Potlining processing Trial at its Kurri Kurri premises.

This EA has been prepared to assess whether the Trial is likely to significantly affect the environment and to support the Application for the Modification of Weston Aluminium's Development Consents required to undertake the Trial.

Proposed Modification

Weston Aluminium is proposing to process 200T of 2nd Cut Spent Potlining (SPL), over a 12 month period, within one of Weston Aluminium's existing rotary furnaces located at its Kurri Kurri premises. The Trial will generally replicate operating conditions of the successful processing Trials conducted in August 2010. Processed SPL material will be sent to prospective end use customers for product evaluation, with customer feedback used to determine sustainability and viability of end use markets.

Air Quality Assessment

Air quality data collected during the August 2011 Trial is detailed within section 4.1 of the EA. The assessment demonstrates the suitability of existing pollution control systems to maintain compliance with existing regulatory requirements. Weston Aluminium will operate within existing Environmental Compliance Limits as detailed within their Environmental Protection Licence.

Hazards and Risk

Hazard and risk analysis has been undertaken for all SPL processing activities. Transportation, storage and product handling facilities are appropriate for the material classification of Dangerous Goods Class 4.3 Package Group III material.

Conclusion

The management and disposal of SPL material generated through the primary production of aluminium represents a major issue faced by the aluminium industry. Since 2005, Weston Aluminium has undertaken research and development activities designed to validate processing equipment located at its Kurri Kurri site. In August 2010, Weston Aluminium conducted a successful processing Trial, with environmental monitoring data collected throughout the Trial, confirming the suitability of existing environmental control system for the processing of SPL material. The current proposed Trial is aimed at generally replicating the previous successful Trial and generating sufficient quantities of processed material for customer's evaluation. This proposal for SPL processing is essential for the identification and validation of sustainable end use market opportunities for the processed SPL. The



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undertaking of the Trials will not impact environmental performance nor pose a risk to the community.

1 Introduction

This Environmental Assessment (EA) supports an application under Section 75W of the NSW Environmental Planning and Assessment Act 1979 from Weston Aluminium Pty Limited (Weston Aluminium) to modify its existing Development Consents (DA-86-04-01-Mod 5 and DA 10397 1995 Mod 3) to undertake a Spent Potlining processing Trial at its Kurri Kurri premises.

The EA has been prepared to assess whether the Trial is likely to significantly affect the environment and to support the Application for the Modification of Weston Aluminium's Development Consents required to undertake the Trial.

1.1 What is Spent Potlining?

SPL is a by-product of primary aluminium production, generated from the periodic de-lining of electrolytic cells. First Cut SPL (originating from the carbon cathode) and Second Cut SPL (refractory lining) contain varying proportions of aluminium, carbon, cyanide, fluorides, sodium and other trace contaminants, with its management and disposal representing a major issue faced by the industry. Weston Aluminium is focused primarily on processing Second Cut SPL.

1.2 Background to Weston Aluminium's Research and Development Program

Since 2005, Weston Aluminium representatives have undertaken extensive research, both domestically and overseas, investigating available technologies for the treatment of SPL from primary aluminium smelters. Weston Aluminium's objective is to offer a sustainable solution to domestic smelters, enabling the cost-effective treatment of SPL and, in conjunction with other treated industrial by-products, formulate the manufacture of a value-added substitute for roadbase and other building and construction products. This particular project was conceived through Weston Aluminium's membership in the NSE Office for Environment (OHE) Sustainability Advantage Program, and central foundation and ongoing involvement with the NSW Industrial Ecology Network. The Industrial Environmental Network is represented by like-minded industry, academics and Government regulators, eager to encourage the recovery of industrial by-products as valuable resources, and thereby achieve the diversion of large material volumes from landfill.

Weston Aluminium has undergone a series of Trials to establish the suitability of processing technologies and to verify environmental compliance.

1.2.1 Laboratory Scale Trials – New Zealand

Weston Aluminium undertook laboratory-scale trials in New Zealand during the period February - April 2010 to demonstrate a rotary furnace treatment process with a suitable emission control performance of the small-scale plant. The Trial involved the processing of SPL with additives (cullet, iron oxide and scrubber lime) in a 2.7m length diesel-fired kiln at temperatures of 650°C – 750°C in a batch-style process, and the recovery of the liquefied glassy slag residue.

The emission control system comprised a wet lime scrubber and fabric filter baghouse constructed for the removal of fluoride and particulate emissions. This pollution control system was designed and operated to emulate that operating at Weston Aluminium's Kurri Kurri facility, and from which a full-scaled operation could be modelled.

Analyses were performed to profile the input raw materials and to characterize the treated products. The collected data demonstrated the complete destruction of cyanide and the immobilisation of fluoride and heavy metal contaminants contained within the treated material.

Emission testing was performed by K2 Environmental in conjunction with the Trial processing to assess emissions of gaseous and particulate fluoride, gaseous and particulate cyanide and of total particulate matter. A summary of findings are summarized in **Table 1**. These data demonstrate the control and removal of fluoride, particulates and cyanide by the small-scaled lime scrubber and fabric filter baghouse.

Table 1- Summary of Emissions Testing Data for NZ Trial Processing

Emission Parameter	Total Particulate Matter	Cyanide			Fluoride		
		Gaseous Cyanide	Particulate Cyanide	Total Cyanide	Gaseous Fluoride	Particulate Fluoride	Total Fluoride
Emission Concentration	<0.12	0.0068	<0.000045	0.068	0.072	0.070	0.14
Regulatory Limits	50	NL	NL	NL	NL	NL	50
NOTE: Values are expressed as mg/m ³ , dry gas, 0°C and 1 atmosphere Regulatory limits sourced as Group 6 criteria; <i>General Activities and Plant</i>							

1.2.2 Onsite Rotary Furnace Trial – 14 August 2011

Following the completion of NZ-based trials, Weston Aluminium sought a Development Consent Modification and Environment Protection Licence variation to validate the treatment process and emission control systems on a larger scale before considering the development of a commercial operation.

Weston Aluminium's Kurri Kurri processing facility was considered ideal for the validation trial due to the compatibility of existing unit processes and practices including:

- Rotary furnaces, capable of attaining elevated temperatures required to thermally oxidise cyanide (typically >650°C);
- Casting facilities for the recovery of treated SPL; and
- Best-practice emission controls systems, including extraction hoods, wet-dry lime scrubber, baghouse complex, and real-time continuous fluoride and particulate monitoring system controlled by a Citect-based PLC.

On 14 August 2010 approximately 8T of second cut SPL was sourced from Tomago Aluminium and processed in one of the existing rotary furnaces. A Monitoring and Verification Report detailing laboratory analysis and monitoring data collected throughout the Trial including that of feed, product and stack emission testing was issued to the DoP,

DECCW and Cessnock City Council on 4 March 2011. A copy of the Monitoring and Verification report is detailed in **Appendix A**.

The Trials were undertaken to establish:

- Optimal furnace operating conditions, including identifying suitable batch/residence time, required operating temperature and rotation protocol for the complete destruction of cyanide contained within the untreated SPL;
- Verification of the performance of the existing pollution control system;
- Verification of the performance of feedstock formulations implemented in NZ and of SPL-only feeds; and
- Assessment of gas usage requirements.

SPL was processed independently to normal aluminium dross processing activities to allow the assessment of emissions performance directly attributed to SPL processing. Rotary furnace off-gasses were directed through the existing wet-dry fluoride scrubber and baghouse pollution control systems. Emission control emission performance was monitored continuously throughout the Trial by real-time stack emissions monitoring and independent NATA accredited stack emission testing.

Samples from both feed and processed SPL were submitted to a NATA accredited laboratory to profile and determine residual contaminants present within the material. Cyanide concentrations contained within the process SPL material were dramatically reduced and were considered to be negligible however the treated material still exhibited similar heavy metal leachability rates relative to that determined for the raw SPL feedstock materials.

Real-time, continuous emission monitoring data confirmed that gaseous fluoride and particulate emission concentrations were below the regulatory compliance limits throughout the entire Trial interval. Treatment temperatures during the trial were increased to over 1000°C to demonstrate worst-case fluoride dissociation, with the pollution control system demonstrating appropriate fluoride scrubbing capability. NATA-accredited emission testing was undertaken in conjunction with Trial activities, revealing low pollutant discharge concentrations, thus confirming the suitability of the existing lime-scrubber and fabric filter baghouse pollutant control systems. All air emission concentrations were below regulatory compliance limits demonstrating the suitability of the existing pollution control system for future processing of SPL.

1.2.3 Rotary Furnace Optimisation Laboratory Trials – Newcastle 2011

A process optimisation study was conducted using a laboratory scale infra-red rotary furnace located at the University of Newcastle Newbolds laboratories during February 2011. 1kg samples of second cut SPL was heated to different treatment temperatures ranging between 450°C – 750°C for a period of 45min. Treated SPL samples were collected for each temperature point and submitted to a NATA accredited laboratory for testing to determine remaining cyanide contamination contained within the treated sample. Data obtained from the study will be used to refine future process conditions required to meet SPL processing

objectives in future Trials. Cyanide concentration data collected during the experiments is detailed in **Table 2**.

Table 2 - Cyanide Concentration for Different Treatment Temperatures

Treatment temperature (°C)	Cyanide Concentration (mg/kg)
Untreated	97
450	3
550	1
650	<1
750	<1

A treatment temperature of greater than 650°C was determined to be sufficient for the complete destruction of cyanide contained within Second Cut SPL material, which is consistent with previously published literature for SPL treatment.

1.3 Proposal Description

Weston Aluminium is proposing to process 200T of 2nd Cut SPL, over a 12 month period, within existing rotary furnaces located at its Kurri Kurri premises. 2nd Cut SPL will be sourced and transported to the Kurri Kurri plant from local primary aluminium smelters, Tomago Aluminium and Hydro Aluminium. Treated material will be laboratory tested to ensure sufficient removal of contaminants, prior to the treated material leaving site.

1.4 The Environmental Assessment Requirements

1.4.1 Planning Requirements

Section 75W of the NSW Environmental Planning and Assessment Act 1979 provides a mechanism for the Minister for Planning to modify approvals. Section 75W (2) states that a *“Minister’s approval for a modification is not required if the project as modified will be consistent with the existing approval under the part”*. As DoP has determined that the proposal is not consistent with the Minister’s approval, Weston Aluminium is required to undergo a process to modify existing Development Consents.

The Minister for planning is the approval authority for this Proposal with an environmental assessment required to address Director General Requirements issued by the Department of Planning on 17 May 2011 are detailed in section 1.4.2.

1.4.2 Department of Planning Director General Requirements

Director General Requirements (DGRs) were issued by the Department of Planning on 17 May 2011. The DGRs were prepared in consultation with other government agencies based on information supplied by Weston Aluminium on the 28 March 2011, and are detailed in **Appendix B**.

Key issues identified with the DGRs to be addressed within the Environmental Assessment are detailed in **Table 3**

Table 3 – Key Issues Identified in DGRs

Key Issue	Detail to be addressed in Environmental Assessment
Air Quality	Including a comprehensive air quality assessment
Waste Management	Including the quantity and classification of all liquid and solid waste to be generated by the modification and how this waste would be handled, processed and, if necessary, disposed of.
Hazards and Risk	Including a Preliminary Hazard Analysis (PHA) in accordance with Hazardous Industry Advisory Paper No. 6 – Guidelines for hazards Analysis and Multi-Level Risk Assessment and details of fire /emergency measures and procedures.
Soil and Water	-
Traffic	Including details of revised traffic movements both on and off site
Greenhouse Gas	Including a quantitative assessment of the scope 1 and 2 greenhouse gas emissions of the project and an assessment of all reasonable and feasible measures that could be implemented to minimise the generation of greenhouse gas emissions associated with the project.

1.4.3 Consultation with Regulatory Authorities

Weston Aluminium consulted with Office of Environment and Heritage (OEH), 21 Feb 2011, and Department of Planning (DoP, 28 Feb 2011 and 30 March 2011), in regards to the proposed SPL Trial. Following the issuing of DGRs by the Department of Planning on 17 May 2011, Weston Aluminium sought clarification of EA requirements to be address in the environmental assessment from OEH on 23 May 2011, and DoP on the 24 May 2011, with the following feedback provided in **Table 4**:

Table 4 – Feedback on DGR Requirements by Regulatory Authorities

Key Issue	Detailed to be addressed in Environmental Assessment
Air Quality	The level of detail included within Weston Aluminum's Application of 28 March 2011 is considered satisfactory. Detailed dispersion modelling and quantitative greenhouse gas assessments are not required.
Waste Management	A description of the proposed storage, handling and process treatment technologies will be detailed in the Environmental Assessment. It is acknowledged that no output wastes will be generated.
Hazard and Risks	The level of detail in Weston Aluminum's original Application reflects the hazard and risk management strategies adopted by the site for Dangerous Goods Class 4.3 Package Group III materials. This is consistent with DG classification status of SPL. This level of detail is considered sufficient for the proposed Trial.
Soil and Water	The Environmental Assessment will acknowledge that, as there is no construction activities associated with the proposal, there will be no impact upon soils and local water values.
Traffic	The Environmental Assessment will acknowledge additional 32 traffic movements
Greenhouse gas	A qualitative assessment will be undertaken to identify opportunities to minimise greenhouse gas generation

1.4.4 Community Consultation

Weston Aluminium has undergone consultation with community representatives, industry and regulatory authorities via:

- The distribution of a 2 page information letter; and
- A formal information session conducted on 8 June 2011

A two page information letter outlining details of the proposed Trial was sent to local environmental interest groups, Regulatory Authorities and local aluminium smelter representatives on the 26 May 2011. On the 8 June 2011 Weston Aluminium held a formal information session at its Kurri Kurri premises to ensure that community concerns and questions were adequately addressed within the Environmental Assessment. A list of information session attendees, a mailing list, an example of the information letter and an outline of comments and questions raised during the consultation process is detailed in **Appendix C**

1.4.5 Approval Requirements

Weston Aluminium currently operates under two separate Development Consents being:

- Ministerial Consent (DA-86-04-01-Mod5); and
- Land and Environment Court Development Consent (DA10397 1995 Mod 3)

Weston Aluminium is seeking a Modification to its current Development Consents from the Minister for Planning under Section 75W of the EP&A Act to undertake a 200T SPL processing Trial over a 12 month processing period.

2 Proposal Needs and Options Considered

2.1 Proposal need

At present, the two primary smelters in NSW (Tomago Aluminium Company and Hydro Aluminium) have not yet attained an effective and sustainable solution for their generated SPL with each continuing to stockpile surplus SPL and/or export the waste to Europe for treatment. This is a significantly expensive process, relying on the transport of hazardous materials over many jurisdictions and the vagaries of third party countries. This strategy is clearly not sustainable for the domestic industry.

Although limited treatment and beneficial reuse of 1st Cut SPL is occurring domestically there has been limited success in developing end use market opportunities for the 2nd cut refractory brick component of SPL. Processed SPL material generated from Weston Aluminium's Trial is aimed at developing end use market opportunities for the 2nd treated material.

2.2 Alternatives Considered

2.2.1 Do Nothing

SPL material will continue to be stockpiled and/or transported overseas for processing at considerable cost to local aluminium smelters.

2.2.2 200T SPL Processing Trial

The Trials will allow Weston Aluminium to supply prospective end use customer's sufficient treated material samples to be used in determining the suitability of the material within different industrial processes. Feedback from these customers will allow Weston Aluminium to develop treated material processed specifically to end use customer specifications and ensure the sustainability of the end use markets. This option is the preferred option.

3 Proposal Description

3.1 Location of Proposal

The proposed SPL Trial will be conducted at Weston Aluminium's existing Plant located at 129 Mitchell Avenue, Kurri Kurri. The storage and processing of SPL will be undertaken within existing storage buildings and processing through existing rotary furnaces. The Trial does not require any alterations to existing equipment or pollution control systems, nor the construction of any additional infrastructure. An Ariel photo of Weston Aluminium's Kurri Kurri facility is detailed in **Figure 1**.



Figure 1 - Aerial photo of Weston Aluminium's Kurri Kurri Premises

3.2 Proposal Outline

Following the successful completion of Trials aimed at establishing the suitability of existing rotary furnaces and associated environmental controls, Weston Aluminium seeks to process additional 2nd Cut SPL to explore potential beneficial end use opportunities for the treated material within different industrial processes. In order to provide sufficient time and treated material quantities for prospective customers to evaluate the suitability of the material as an input within their processes, Weston Aluminium is proposing to treat up to 200T of 2nd Cut SPL over a 12 month period. The 200T of 2nd Cut SPL material will be processed through a series of 2.5-3.5T batches, identical to the process employed for the previous Trial conducted on the 14 of August 2010.

The following works are proposed for the Trials:

- 1 Risk Assessments and Safe Operating Procedures have been developed for the safe transport, handling, storage and processing of SPL. These assessments and procedures will describe specific requirements for the transport and handling of DG Class 4.3 PGIII materials, which have the potential to evolve flammable gases upon contact with water. Aluminium dross has the same DG classification, and hence Weston Aluminium currently have facilities and procedures for the correct storage, handling and processing of such materials, and for the mitigation of their contact with water;

- 2 Approximately 200T of 2nd Cut SPL will be sourced locally either from Tomago Aluminium or Hydro Aluminium (or a combination of both).
- 3 Trial processing of the SPL will occur at our Kurri Kurri facility over a 12 month period commencing in 2011.
 - The delivery of SPL materials from Tomago Aluminium or Hydro Aluminium will be undertaken by a licensed Dangerous Goods transport contractor. Transport routes, material handling and documentation protocols established and implemented for current aluminium dross movements from these sites will be adopted for the transport and handling of SPL;
 - SPL feedstock materials (bulk delivery or in bulk bags) will be stored in existing, purpose-built and enclosed bays until processing. SPL received from each smelter will be stored separately for quality control purposes. Only feed SPL material required for individual trials will be stored onsite. Other inputs (as required) will similarly be stored undercover. Emission scrubber lime inputs are currently generated onsite, and will also be stored undercover in bulk bags awaiting trial use;
 - Design formulations of SPL only and SPL blends containing compatible additives will be processed through an existing natural gas-fired rotary furnace in 2.5 – 3.5T tonne batches. Batch mixes will be processed at temperatures greater than 650°C to effect cyanide destruction. Temperatures achieved will be confirmed by thermocouple assessment;
 - SPL processing Trials will be undertaken during the hours of 7am to 6pm Monday to Saturday;
 - The existing wet-dry fluoride scrubber and baghouse pollution control system will be maintained and operated as per normal operation to control air emissions to within regulatory requirements. This infrastructure includes real-time, continuous fluoride and particulate monitoring devices associated with Baghouse 1. Weston Aluminium has proven, through previous Trials that furnace operations will effect thermal destruction of cyanide at temperatures greater than 650°C, and that existing pollution devices will adequately monitor and control fluoride and particulate air emissions. No further emission pollutants are expected to occur;
 - Processed SPL material will be tapped from the furnace into existing sow molds or bins. Once sufficiently cooled, the product will be stored undercover awaiting laboratory assessment and future integration into Trial end-use products;
- 4 NATA-certified laboratory analysis of the treated product will be undertaken to confirm cyanide destruction and contaminant immobilisation. The proposed analytical suite may include an assessment of total contaminant loads (including cyanide, fluoride, alkalis and heavy metals) and leachable contaminant loads (including

cyanide, fluoride, alkalis and heavy metals) using the Toxicity Characterisation Leaching Procedure (TCLP); and

- 5 Real-time particulate and fluoride data and feed and treated material analysis will be retained and supplied to the regulatory authorities upon request.

3.3 Timing and Commencement of Work

The Trial is anticipated to commence during 2011, with Trials being undertaken over a 12 month production interval.

4 Environmental Impact Assessment

4.1 Air Quality

Currently Weston Aluminium operates two rotary furnaces to recover aluminium from dross at its Kurri Kurri plant. Emissions generated from this process are transferred via associated ductwork to the existing wet-dry lime scrubber-baghouse complex that removes fluoride and particulate prior to discharge.

The principal objective of the SPL Processing Trial conducted on 14 August 2010 was to assess emissions and demonstrate the suitability of existing pollution control and monitoring systems. Data collected from independent stack emission testing was utilised to verify that air emissions generated during SPL processing activities could be controlled and maintained to the satisfaction of existing regulatory requirements.

Processing was undertaken over extended periods and at elevated temperatures above 650°C to represent worst-case exhaust generation (in particular, fluoride evolution), and hence determine air emission control performance.

Continuous emissions monitoring of gaseous fluoride concentrations was performed throughout the Trial to assess compliance with the regulatory limit. Hourly average fluoride data are presented in **Figure 2** for comparison with the regulatory limit of 1.4 mg/m³.

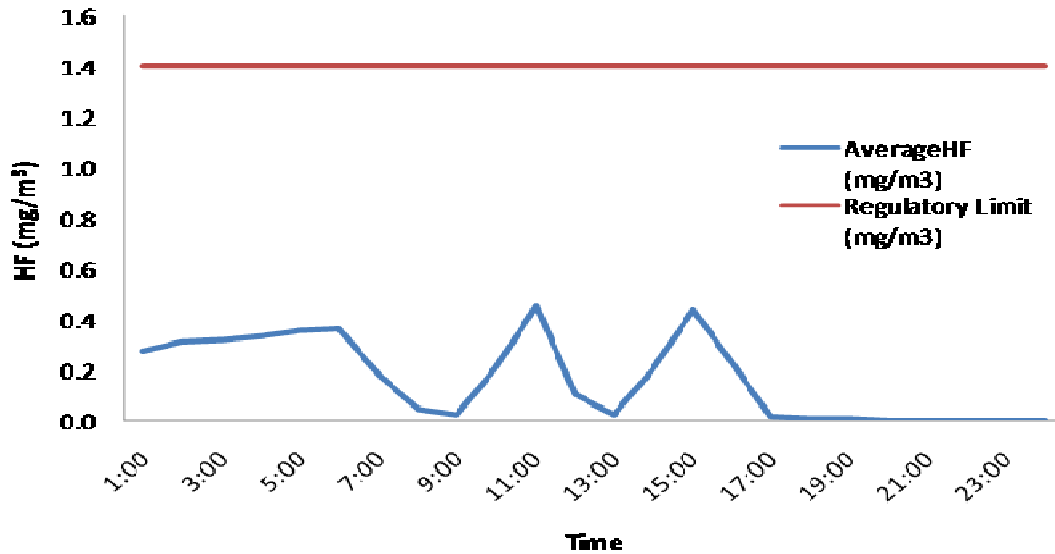


Figure 2 - Fluoride Emissions from August Trial

A maximum hourly Hydrogen Fluoride average concentration of 0.6 mg/m³ was recorded for the duration of the trial, which is significantly below Weston Aluminum's regulatory limit of 1.4mg/m³. The collected data demonstrated that even at elevated processing temperatures (greater than 650°C), the existing pollution control system currently operating at its Kurri Kurri facility was adequate at controlling Fluoride emissions generated from processing SPL. Process operating temperatures for the proposed Trial will be lower than process conditions in the August trial, ensuring reduced fluoride dissociation, leading to a reduced loading of the pollution control system.

In addition to Real time monitoring, and to further validate real time fluoride and particulate data, NATA accredited stack emission testing was conducted during the Trial with the results detailed in **Table 5**.

Table 5 – Stack Emission Testing Results Recorded for August Trial

Emission Monitoring Parameter	Trial Emission Monitoring	Regulatory Compliance Limits
Total Particulate Matter	8.9	25
Fine Particulate Matter	0.24	NL
Hydrogen Chloride	0.95	400
Chlorine	0.42	NL
Particulate Fluoride	0.027	NL
Gaseous Fluoride	0.38	2
Sulfuric Acid Mist	<1.6	100
Sulfur Dioxide	<7.8	NL
Total Hazardous Substances (metals)	0.017	10
Total Polycyclic Aromatic Hydrocarbons	0.74	NL
Volatile Organic Compounds	<0.17	NL
Total Oxides of Nitrogen (as equiv. NO ₂)	4	2500
Carbon Monoxide	5	100
Cyanide	<0.061	NL
Oxygen (%)	20.7	NL
Temperature (°C)	52.4	NL
Velocity (m/s)	30	NL
Dry Gas Density (kg/m ³)	1.29	NL
Notes: All values are expressed in mg/m ³ (0°C, 1 atm, dry gas) unless otherwise defined NL – Not Listed ND – Not Determined		

All air pollutant emission concentrations monitored during the Trial complied with Weston Aluminium's existing regulatory requirements. No exceedances of air pollutant concentration limits occurred during the Trial. The air emission results verify that existing air emission monitoring and control systems employed at Weston Aluminium were functioning correctly for the duration of the Trial, and performed more than adequately to maintain environmental compliance during the processing of SPL.

The proposed Trials are aimed at replicating the August Trial with fluoride and particulate data expected to be similar if not lower than the previous Trial.

4.2 Waste Management

Weston Aluminium currently is permitted to receive Aluminium Dross a material classified as a Dangerous Goods Class 4.3 Package Group III material. This is consistent with DG classification status of SPL. Weston Aluminium has implemented material handling, storage strategies to ensure the material is handled appropriately throughout all production steps. Strategies for the safe transportation, storage, handling and processing of SPL are as follows;

- All raw material truck delivery loads will be covered by tarpaulin (similar to dross deliveries) or via tautliner to prevent spillages;
- No deliveries will occur during wet weather;
- The unloading and storage of untreated and processed material will be within existing enclosed buildings;



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- Weston Aluminium will operate existing fabric filter baghouses for the control and removal of particulate that may arise during the unloading and loading process;
- All trial operations will be performed within enclosed buildings to mitigate against external spills; and
- Should a spill occur, site personnel will recover materials in accordance with established spill response procedures. Spilt material will be returned to storage for processing (i.e. not disposed of).

It should be noted that no waste by-products will be generated or accumulated onsite from undertaking the proposed Trial. All material processed onsite will be removed from site to relevant end use customers. Untreated SPL material will only be transported to site once a suitable end use has been identified.

4.3 Hazards and Risk

Environmental Aspect	Potential Environmental Issue	Management and Mitigation Measure	Potential Environmental Impact
Air Quality	• Generation of fugitive dust emissions • Exceedance of existing regulatory compliance stack air emission limits (including particulates and fluoride)	• Trials performed at Weston Aluminums Kurri Kurri premises on the 14 September 2010 confirm that lime scrubber and fabric filter baghouse pollution control systems operate to effectively control emissions to acceptable levels. Further, trials also confirmed that the raw materials and process do not generate nuisance odour. • All trial operations will be performed within enclosed buildings. • Deliveries of raw materials will be by truck. All delivery loads will be covered by tarpaulin (similar to dross deliveries) or via tautliner. • All relevant facilities/unit operations (storage bays, furnace melting and casting) are serviced by existing pollution control systems (also see below). • Weston Aluminium will operate existing fabric filter baghouses for the control and removal of particulate matter. The existing PCME monitoring system will be operated to provide continuous, real-time assessment of particulate emissions from Stack 1. • Typical fluoride loads within SPL are in the same order or lower than that of aluminium dross currently processed onsite. Fluoride will be expected to occur within furnace gases at the proposed trial temperatures (650–850°C). Weston Aluminium will operate existing wet-dry lime scrubber systems for the control and removal of fluoride within furnace exhaust. The existing Citect monitoring system will be operated to provide continuous, real-time assessment of gaseous fluoride emissions from Stack 1. • Furnace burners are routinely tuned on an annual basis to ensure optimal operating efficiencies. This minimises emissions of carbon monoxide, volatile organic compounds and oxides of nitrogen.	• Emission performance is expected to be similar to that of normal site operations, and remain within existing compliance limits. Weston Aluminum are not seeking to increase Regulatory Emission Concentration Limits. The potential impact on local air emissions is therefore considered to be low.



Environmental Aspect	Potential Environmental Issue	Management and Mitigation Measure	Potential Environmental Impact
Water Quality	Spills of raw materials to site catchment and pollution of local water ways	- All raw material truck delivery loads will be covered by tarpaulin (similar to dross deliveries) or via tautliner to prevent spillages. - No deliveries will occur during wet weather. - All trial operations will be performed within enclosed buildings to mitigate against external spills. - Should a spill occur, site personnel will recover materials in accordance with established spill response procedures. Spilt material will be returned to storage for processing (i.e. not disposed of). - The onsite Stormwater management system (drainage network, pond and wetland) captures and contains all runoff from potentially dirty areas, including hardstand and traffic ways, for subsequent onsite irrigation reuse. Only waters impinging on the catchment after this first flush is contained are directed to the adjacent Swamp Creek (north-west corner of site). The pond and wetland will similarly contain any spills, should they occur. It is expected, however, that this system will not be relied upon due to other controls proposed for the Trial.	The potential impact on local water ways is therefore considered to be low.
Noise	Exceedance of regulatory compliance noise limits	- Weston Aluminium has necessary approvals for plant operation 24-hours a day, 7-days per week. Specific receptor noise limits are prescribed for daytime, evening and night time periods. Weston Aluminium continues to comply with these limits. Trial operations will nevertheless be restricted to daytime periods (defined as 7am to 6pm Monday to Saturday). - As defined above, all operations will occur within the enclosed Plant Building.	The potential impact on noise amenity is expected to be negligible.
Waste Management	Generation of hazardous waste requiring disposal	- Raw materials may be delivered in polypropylene bulka bags, and if used these bags will be disposed of following Trial completion. A potential of 500 kg of bulka bag waste may be generated, of which up to 250 kg may be associated with SPL deliveries. All raw materials will be delivered in a dry state, and hence, residues of SPL within bags are likely to be negligible. These bags will be disposed of to an approved landfill in conjunction with routine site disposal protocols. - A proportion of waste scrubber lime, which is typically disposed of to landfill, will be utilised as Trial feedstock, and thereby diverted from landfill.	No hazardous waste will be generated by the proposed Trial process.



Environmental Aspect	Potential Environmental Issue	Management and Mitigation Measure	Potential Environmental Impact
		No other waste will be generated during the trial process.	
Hazards	- Potential contact with water and resultant generation of flammable gases - Furnace explosion and expulsion of raw/product materials	- Trial-specific Risk Assessments and Safe Operating Procedures will be prepared and documented prior to Trial commencement. - Contact of raw materials with water (and potential flammable gas generation) will be prevented by coordinating deliveries during dry weather conditions only and by conducting all Trial operations within purpose-built and enclosed buildings. - The risk of furnace explosion and resultant expulsion of material is considered to be negligible. Nevertheless, furnace charging, processing, mixing and casting techniques established for dross processing will also be adopted. This includes loading the furnace with burners off, lowering furnace doors during the processing phase, and idling burners during mixing and casting.	The potential for flammable gas generation, fires and furnace explosion is considered to be negligible.

4.4 Traffic

A Traffic assessment undertaken as part of the 2001 EIS – Additions to the Kurri Kurri Aluminium Refining and Recycling Facility projected that there would be an approximately 46 truck movements and 18 light vehicles each day. This equates to a total of 920 vehicle movements each month. Currently Weston Aluminium average 26 truck vehicle movements per day equating to 780 vehicle movements per month (beginning of March 2011– end of May 2011). Vehicles enter and exit the site via the access road off Mitchell Avenue.

The proposed Trial will require an additional 32 truck movements (8 vehicles entering and exiting the site to delivery untreated SPL and 8 trucks entering and exiting the site to remove treated material) over the 12 month Trial interval. All trucks delivering and removing material will be filled to capacity to minimise required truck movements.

4.5 Greenhouse Gas

Weston Aluminium furnace burners are routinely tuned to optimise burner efficiencies, and minimise greenhouse gas emissions. The generation of unburnt methane and other natural gas constituents is not likely to occur due to burner tuner and set-up, and furnace temperatures proposed for the Trial.

Weston Aluminium will collect gas usage data during the Trial data which could be utilised in further greenhouse gas studies potentially required to permit future SPL processing.

5 Statement of Commitments

The EA of the proposed Trial has outlined a range of environmental and social management measures and strategies aimed at minimising or avoiding environmental and social impacts. All parties involved in the Trial will operate in accordance with the commitments detailed in **Table 6**.

Table 6- Statement of Commitments

Issue	Safeguards
Air Quality	• Bag Filters will be regularly cleaned to ensure the maximum removal efficiency of particulates throughout the trial • Continuous particulate and fluoride monitoring systems associated with Stack 1 (operated in accordance with the Development Consents) will be active throughout the Trial. Particulate and Fluoride data will be used to assess: ○ Ongoing particulate compliance limit of 25mg/m³; ○ Ongoing fluoride compliance limit of 1.4mg/m³ hourly average; and ○ Provide an early warning system for bag failure and maintenance.
Waste Management	• All raw material truck delivery loads will be covered by tarpaulin (similar to dross deliveries) or via tautliner to prevent spillages. • No deliveries will occur during wet weather. • The unloading and storage of untreated and processed material will be within existing enclosed buildings • Weston Aluminium will operate existing fabric filter baghouses for the control and removal of particulate matter that may arise during the unloading and loading process • All trial operations will be performed within enclosed buildings.
Hazards and Risk	• Trial-specific Risk Assessments and Safe Operating Procedures will be prepared and documented prior to Trial commencement.
Traffic	• Transportation trucks will be filled to capacity to ensure minimum transportation movements to and from the site.
Greenhouse Gas	• Weston Aluminium will ensure burners are tuned prior to undertaking SPL processing Trials • Gas usage data will be collected during the Trials and can be provided to regulatory authorities upon request

6 Justification and Conclusion

The management and disposal of Spent Potlining material generated through the primary production of aluminium represents a major issue faced by the aluminium industry. Since 2005, Weston Aluminium has undertaken research and development activities designed to validate the processing equipment located at its Kurri Kurri site. In August 2010, Weston Aluminium conducted a successful processing Trial, with environmental monitoring data collected throughout the Trial, confirming the suitability of existing environmental control systems supporting the processing of SPL material.

The proposed Trial is aimed at replicating the previous successful Trial, thereby generating sufficient quantities of processed material for customer's evaluation. The proposal for SPL processing is essential for the identification of sustainable end use market opportunities for the processed SPL. The undertaking of the Trials will not impact environmental performance nor pose a risk to the community.

Appendix A - Monitoring and Verification Report

Appendix B - Department of Planning Director General Requirements

Appendix C - Community Consultation

Mailing List for Information Letter

Group	Contact	Address
Cessnock City Council	Cessnock City Council PO Box 152 CESSNOCK NSW 2325	General Manager
Department of Planning	GPO Box 39 SYDNEY NSW 2001	Emma Barnett
Friends of Tumblebee	PO Box 52 KURRI KURRI NSW 2327	Friends of Tumblebee
Hydro Aluminium	Hydro Aluminium PO Box 1 KURRI KURRI NSW 2327	Barry Arens
Kurri Kurri Landcare Group	21 Brooks Street KURRI KURRI NSW 2327	Col Maybury
NSW Office of Environment & Heritage	PO Box 488G NEWCASTLE NSW 2300	Ross Brylynsky
Kurri Kurri Tidy Town	Kurri Kurri Community Centre 251 Lang St KURRI KURRI NSW 2327	Bill Way
Tomago Aluminium	PO Box 405 RAYMOND TERRACE NSW 2324	Neil Roser
Weston Heritage & Tidy Town	18 Second St WESTON NSW 2326	Jeff Maybury

Information Session Questions and Comments (8 June 2011)

Item Number	Question/Comment	Response
1	For the proposed Trial, are Weston Aluminium seeking the same Development Consent Modification and Environmental Protection Licence Variation as sought for the earlier August 2010 Trial?	Yes. EA for proposed Trial is to reflect a larger scale (200Mt cf. 40Mt) and longer duration (6 mths cf. 2 days)
2	What is the holding time likely to be for the material?	Expected that raw material would be held for no more than 1 mth at a time before processing. Proposed that the Trial be undertaken as small campaign inputs, rather than receiving and processing full 200Mt at one time.
3	How confident is Weston Aluminium that an end-use market will accept the material?	Weston Aluminium has undertaken market research, and has forwarded samples (generated from earlier Trial) to the market for review and assessment. Interest is there, and market is eager to receive larger quantities of treated material for assessment. WA has also a subsidiary Company (Weston Matrix) who is capable of receiving treated material as part of performance-based roadbase manufacture. Other opportunities for large-scale beneficial reuse exist overseas. WA is confident that proposal will progress to a commercial project.
4	Are Tomago Aluminium and Hydro Aluminium contributing financially to the Trial?	Commercial arrangements have not yet been formally discussed. Likely to be a financial contribution from Smelters.
5	When is the Trial due to commence?	WA is currently seeking stakeholder feedback and will then complete the Environmental Assessment. Following lodgement and determination, we hope to commence Trial activities this calendar year. Whilst DoP and OEH are apologies to this information session, we have held prior meetings to discuss the proposed Trial and understand the issues they require to be addressed in the EA. We suspect that the determination process should be straightforward and not delayed.
6	Are the Trials to be straight SPL inputs, or are there other additives?	WA has explored other inputs such as lime, but the blends will be dictated by the end-use market application requirements and specifications.
7	What Approval process is needed for reuse of the treated SPL?	Where required, WA will seek a Specific Resource Recovery Exemption from the Regulators for reuse. This process has been sought by Weston Matrix for reuse of flyashes and coal washery rejects for roadbase manufacture. This is a formal process to tick

		off for suitability and evaluation of environmental impact. Process defines criteria for material testing and classification. If required, WA is confident that Specific Exemptions would be granted. WA will be working closely with OEH to coordinate this process.
8	As SPL generators, expected that Smelters will facilitate reuse, not block their reuse.	As generators, Smelters know that the 1 st Cut SPL has contaminants, whereas such contaminants may only be present in pockets in the 2 nd Cut SPL. 2 nd Cut SPL classification is therefore precautionary. In overseas countries, 2 nd Cut SPL is classified as non-hazardous, and can be landfilled. Only 1 st Cut SPL is classified as hazardous. In Australia, both 1 st and 2 nd Cut SPL are classified as hazardous.
9	WA will have to sell a lot of roadbase to make their money back.	Smelters incur costs associated with storage, transport and treatment overseas is quite costly. WA also added that we are also reviewing other markets in addition to roadbase.
10	Suggested that WA seek Trial duration as 12-mths rather than 6-mths for practical and logistical reasons. May be constrained by only 6-mths.	Noted and agreed. EA to be amended accordingly.
11	Transport is minor issue	200Mt translates to 8 trucks.
12	What are the current stored quantities at Smelters?	30,000 – 35,000Mt in sheds at Hydro Aluminium. 100,000 – 120,000Mt in landfill (mixed). Generation is in the order of 8,000 – 12,000Mt per annum. Regain engaged currently to process 12,000 – 15,000 Mt per annum to keep in balance with current arisings.
13	What is the throughput of our process?	Process is batch and scale is limited. WA will consider up-scaling process.
14	Regain activities?	Regain predominantly process 1 st Cut SPL. Makes sense for the Smelters to treat 1 st Cut SPL, and store 2 nd Cut. Acknowledged that it is difficult to promote the reuse of treated 1 st Cut SPL. Weston Aluminium hopes to complement Regain activities
15	Cyanide issue is of concern.	Contaminant level in 2 nd Cut SPL is much lower, and WA have existing systems to transport and handle material. Earlier Trials verified that cyanide is effectively destroyed to less than detectable quantities. WA representatives are invited to attend a Kurri Kurri Landcare meeting during July 2011 to discuss further.
16	In view of Smelter Licence requirements, we need to be able to demonstrate mass balance of material flow.	Noted. This is consistent with the process undertaken for the August 20120 Trial.
17	Copies of Presentation requested.	Copies to be distributed to all attendees.

Re: Weston Aluminium – Proposed SPL Processing Trial

Dear XXX,

I am writing to invite you to an information session to be held at 4:00pm on 8 June 2011, at our Kurri Kurri premises to outline details of our proposal to undertake an SPL processing trial. Weston Aluminium Pty Ltd (Weston Aluminium) is currently seeking a Development Consent Modification from the Department of Planning to allow for the processing of 200T of Spent Pot Lining (SPL) material within one of our existing rotary furnaces at our Kurri Kurri premises.

What is SPL?

SPL is a by-product of primary aluminium production, generated from the periodic de-lining of electrolytic cells. SPL is classified into two different materials:

- First Cut SPL (originating from the carbon cathode); and
- Second Cut SPL (refractory brick lining).

Both First and Second Cut SPL materials require treatment prior to beneficial reuse or disposal.

Weston Aluminium is focused primarily on processing Second Cut Refractory Brick Lining generated locally from primary aluminium smelters.

Research and Development

Since 2005, Weston Aluminium representatives have undertaken extensive research, both domestically and overseas, to investigate available technologies for the treatment of SPL from primary aluminium smelters. Weston Aluminium's objective is to offer a sustainable local solution to domestic smelters. Prior to the proposal, Weston Aluminium has undertaken several trials including:

- Laboratory-scale SPL Treatment Trials - New Zealand, Feb – April 2010;
- 8T Rotary Furnace Trial – Weston Aluminium Kurri Kurri – August 2010; and
- Laboratory Furnace Optimisation Trials – Newcastle - March 2011.
-

During the trials, laboratory testing was undertaken on all feed, product and process emissions to ensure environmental compliance was adhered to at all times. NATA-accredited emission testing results, collected during the recent Rotary Furnace Trials (August 2010) were found to be below regulatory compliance limits, as detailed in our Environmental Protection License. This confirmed the suitability of our current pollution control system for future processing of SPL at our Kurri Kurri premises.

The Proposal

Weston Aluminium is seeking a Development Consent Modification from the Department of Planning and an EPL variation from the Office of Environment and Heritage to process 200T of Second Cut Refractory lining over a six month period. The trials are aimed at replicating the previous successful trial conducted on our premises on 14th August 2010, and to provide additional data to support further SPL processing in the future.

The proposal involves the use of existing technologies located at our Kurri Kurri premises including the following process:

- The transportation of material from local primary aluminium smelters to Weston Aluminium's Kurri Kurri premises;
- The storage of material within existing buildings;
- The processing of material within an existing rotary furnace capable of attaining the required temperatures to thermally oxidise any contaminants;
- The use of best-practice emission controls systems, including extraction hoods, wet-dry lime scrubber, filter baghouse complex, and real-time continuous fluoride and particulate monitoring system controlled by a Citect-based PC; and
- Laboratory testing of processed material prior to the material leaving site.

To provide additional information in regards to the proposal and to allow you to provide any feedback or questions, we will be holding an information session at 4:00pm on 8 June 2011, at our Kurri Kurri plant (129 Mitchell Avenue, Kurri Kurri).

To confirm attendance to the information session please contact Brooke Thompson on 49362166 by the 7 June 2011.

I look forward to discussing the proposal in more detail with you at the information session.

Regards

Antony Taylor

Manager, Alternative Materials & Environment

Weston Aluminium Pty Ltd

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This report has been prepared by Weston Aluminium to support its Application for Modification of their current Development Consents to undertake a SPL processing Trial. At the time of publication the information contained within this document was accurate and not misleading.

Rev No.	Author	Reviewer		Approval for Issue		
		Name	Signature	Name	Signature	Date