



**environment  
SOUTHLAND**

**Application No: N015-018  
Consent No:203378**

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(Private Bag 90116)  
Invercargill

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## **Air Discharge Permit**

**Pursuant to Section 104B** of the Resource Management Act 1991, a resource consent is hereby granted by the Southland Regional Council (the "Council") to **New Zealand Aluminium Smelter Ltd** (the "consent holder") of **Private Bag 90110, Invercargill** from 6 June 2006.

**Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.**

### **Details of Permit**

Purpose for which permit is granted:	To discharge contaminants to the air from an aluminium smelter and related activities
Location	Foveaux Strait at Tiwai Point
- site locality	E47:558-923
- map reference	Air
- receiving environment	
Legal description of land at the site:	Sec 1 Blk XIV Campbelltown HD (SL9C/865), Lot 1 DP 13988 (SL11B/268), Lots 1 & 2 DP 13987 (SL11B/267), Sec 5 Blk XIII Campbelltown HD, (SL9A/612), Sec 9 Blk XIII Campbelltown HD (SL3A/93) Pt Secs 2 & 4 Sec 1 Blk XIII Campbelltown HD and Pt Run 581, Lot 1 DP 7633 and Crown land comprised of Sec 10 Blk XIII Campbelltown HD Historic Reserve (1986/2833), Crown Land Blk XIII Campbelltown HD Crown Land Reservef from sale (Marginal strip) Crown Land Blk XIV Campbelltown HD Crown Land Reserved from Sale (Marginal Strip) (SL9C/865) and CR Blk XIII Campbelltown HD
Expiry date:	6 June 2031

### **Consent Amended**

Conditions amended on 15 September 2010, as follows:

Environment Southland is the brand name of  
the Southland Regional Council

## Schedule of Conditions

### Schedule A

#### *Interpretations*

For the purposes of this permit the following interpretations will apply, unless the context otherwise requires :-

- A1 “Act” means the Resource Management Act 1991 and its amendments.
- A2 “Aluminium produced” means the average hourly production as determined by dividing the total metal tapped from the potlines during the month in which testing took place, by the number of hours in that month.
- A3 “Approved equivalent” means an equivalent approved in writing by the Council’s Director of Environmental Management.
- A4 “Average” means arithmetic average unless stated otherwise.
- A5 “Cell” means an operating unit for the electrochemical reduction of alumina to produce aluminium.
- A6 “Council” means the Southland Regional Council.
- A7 “Guideline” means a level which is set on best current knowledge, the exceeding of which requires further investigation or other action. Exceeding a guideline does not constitute non-compliance.
- A8 “Incidents” means breaches of consent standards, exceeding guidelines, or abnormal events which could have significant adverse environmental effects.
- A9 “Main stack” means the single approximately 137 metre high stack located at or about map reference NZMS 260 E47:559:923.
- A10 “Potline” means one or more potrooms containing a group of cells connected in the same electrical series, plus the primary dry scrubbers which serve them.
- A11 “Potroom” means a building which houses a group of cells.
- A12 “Standard” means a limit which is not to be breached.
- A13 “Standard cubic metre” (normally abbreviated as Sm<sup>3</sup>) means the volume of gaseous effluent which occupies one cubic metre at a temperature of zero degrees Celsius (0°C) and at an absolute pressure of 101.3 kilopascals (kPa).
- A14 “Target” means a time by which action should be started or completed. It also means a concentration at which action should be taken. Not achieving a target does not constitute non-compliance.

- A15 “Tiwai Peninsula” means that area of land described as Section 1 Block XIV Campbelltown Hundred (SL9C/865), Lot 1 DP 13988 (SL11B/268), Lots 1 & 2 DP 13987 (SL11B/267), Section 5 Block XIII Campbelltown Hundred (SL9A/612), Section 9 Block XIII Campbelltown Hundred (SL3A/93), Part Sections 2 & 4 Section 1 Block XIII Campbelltown Hundred, and Part Run 581, Lot 1 DP 7633 and Crown land comprised of Section 10 Block XIII Campbelltown Hundred Historic Reserve (1986/2833), Crown Land Block XIII Campbelltown Hundred Crown Land Reserved from Sale (Marginal Strip), Crown Land Block XIV Campbelltown Hundred Crown Land Reserved from Sale (Marginal Strip) (SL9C/865) and Closed Road Block XIII Campbelltown Hundred.
- A16 “Total condensable hydrocarbons” means those hydrocarbons which are condensed at duct temperature and are already in particle form and those hydrocarbons in the gas stream which can be condensed at zero degrees Celsius.
- A17 “Year” means calendar year.

Other definitions/interpretations shall be those in the Act.

**Schedule B***Performance standards**B1 Source discharge standards*

B1.1 Main stack total particulate, gaseous fluoride, particulate fluoride and sulphur dioxide:

From the commencement of the permit discharges of these contaminants shall be limited to:

Total particulate	1.7 kg/minute
Gaseous fluoride	0.5 kg/minute
Particulate fluoride	0.2 kg/minute
Sulphur dioxide	21.4 kg/minute

These standards are running twelve month averages of monthly test results.

In addition, discharges of these contaminants shall not exceed the following maximum values in eleven out of twelve months:

Total particulate	3.0 kg/minute
Gaseous fluoride	0.65 kg/minute
Sulphur dioxide	23.0 kg/minute

B1.2 Main stack general conditions:

- stack height shall be not less than 137 metres above ground level.
- stack exit velocity shall be not less than 15 metres per second.

B1.3 Main stack smoke discharges

For the purposes of this clause “smoke” shall include all main stack particulate discharges.

Where an instrumental method of opacity monitoring is not operational, the opacity of the main stack discharge shall be measured by observation, by an appropriately trained observer, shall not exceed 40 percent obscuration for more than two minutes continuously and four minutes in total in any hour.

B1.4 The following exemptions from condition B1.3 shall apply:

- For the purpose of changing fires in the carbon bake furnaces, for periods of up to 30 minutes not more often than eight times in a 24 hour day, and shall not exceed a total of three hours in a 24 hour day.
- For the purposes of maintaining the carbon bake furnace and pot room dry scrubber solids collection systems, for periods of up to 24 hours, not more often than nine times per year.

## B1.5 Stacks, other than the main stack

## (a) Dust collectors

- (i) The following shall apply for the first two years after the commencement of the consent:

The concentration of total particulate matter in all dust collector discharges, measured in accordance with condition B1.5(a)(iii), shall not exceed 500 mg/Sm<sup>3</sup>. If tested concentrations exceed 250 mg/Sm<sup>3</sup> control action shall be taken to reduce concentrations to below 250mg/Sm<sup>3</sup> within one month of the date of testing.

- (ii) The following shall apply after two years from the commencement of this consent:

The concentration of total particulate matter in all dust collector discharges, measured in accordance with condition B1.5(a)(iii), shall not exceed 250mg/Sm<sup>3</sup>. If tested concentrations exceed 100 mg/Sm<sup>3</sup> control action shall be taken to reduce concentrations to below 100 mg/Sm<sup>3</sup> within one month of the date of testing.

If tested particulate matter concentrations exceed 250 milligrams per cubic metre, then control action shall be taken and results reported to the Council within 24 hours of the results becoming available.

- (iii) A schedule for testing of all dust collectors for total particulate discharges to determine compliance with conditions B1.5(a)(i) and (ii) shall be forwarded to the Council's Director of Environmental Management for approval within three months of commencement of the consent. The schedule shall require testing of the dust collectors once every two years. The schedule shall include the frequency of dust collector operation and the proposed testing frequency of dust collectors.

## (b) Furnace stacks

- (i) The concentration of particulate matter in discharges from the Metal Products and Green Carbon furnaces, shall not exceed 250 mg/Sm<sup>3</sup>.

- (ii) The opacity of the discharges from the Metal Products and Green Carbon furnaces, shall not be darker than the Ringelmann Shade 1 as determined in accordance with the New Zealand Standard 5201:1973, except:

- (a) in the case of a cold start for a period not exceeding 30 minutes in the first hour of operation; and  
(b) for a period not exceeding four minutes, in each succeeding hour of operation.

There shall be an exemption from this smoke requirement for the purpose of degassing and hot cleaning in Metal Products furnaces. The exemption shall apply for periods of up to 25 minutes not more often than 20 times in a 24 hour day, for all Metal Products furnaces combined.

#### B1.6 Potline roof discharges

Total discharges from the potline roofs shall not exceed the following:

Total particulate	1.50 kg/minute
Gaseous fluoride	0.21 kg/minute
Particulate fluoride	0.30 kg/minute
Sulphur dioxide	0.55 kg/minute

These standards are running 12 month averages of monthly test results.

### B2 *Environmental Standards*

#### B2.1 Ambient air gaseous fluorides

As a result of operations on the consent holder's site, the ambient air gaseous fluoride concentrations measured on land other than Tiwai Peninsula and on Tiwai Peninsula to the east of the eastern-most boundary of Comalco New Zealand Limited's freehold land, shall not exceed the following:

24 hour average	2.0	$\mu\text{g}/\text{Sm}^3$
7 day average	1.0	$\mu\text{g}/\text{Sm}^3$
1 month average	0.5	$\mu\text{g}/\text{Sm}^3$

#### B2.2 Fluoride content in grazed pasture

As a result of operations on the consent holder's site, as described in the "Details of Permit", the fluoride in grazed pasture (on an unwashed, dry weight basis) on land other than Tiwai Peninsula, the following standards shall apply:

- (i) running averages of monthly samples for a period of 12 months shall not exceed 40 mg/kg;
- (ii) the average of any two consecutive months samples shall not exceed 60 mg/kg; and
- (iii) a monthly sample shall not exceed 80 mg/kg more than once in any 12 consecutive months.

Samples taken within 28 days of a site being topdressed or treated with any fluoride containing substance such as phosphatic fertiliser shall be exempt from these standards.

## Schedule C

### *Monitoring Requirements*

#### *C1 Monitoring approvals*

- C1.1 The sites, frequencies and methods of testing and analysis in use at 1 October 2005 shall be deemed to be the approved sites, frequencies and methods in the first instance.
- C1.2 The monitoring sites in use at 1 October 2005 shall be deemed to be the monitoring sites for the purpose of this consent. These sites can be updated at any time on the approval of the Council's Director of Environmental Management following changes approved under condition C1.3.
- C1.3 Any changes to the location of monitoring sites, sampling frequencies or methods of testing and analysis shall be approved in writing by the Council's Director of Environmental Management.

#### *C2 Main stack discharges*

These primarily consist of discharges of ventilation products from pot room cells and combustion products from carbon bake furnaces.

- C2.1 Total particulate, gaseous fluoride, particulate fluoride and sulphur dioxide shall be measured at least monthly.
- C2.2 Total condensable hydrocarbons and polycyclic aromatic hydrocarbons shall be measured at least annually. The polycyclic aromatic hydrocarbons shall be the USEPA priority 16 polycyclic aromatic hydrocarbons.

#### *C3 Potline roof discharges*

These primarily consist of discharges from all potline roof louvres.

- C3.1 Total particulate, gaseous fluoride, particulate fluoride and sulphur dioxide shall be measured at, at least, one location using EPA method 14 or an approved equivalent, at least four times per month.
- C3.2 Other monitoring
- (a) The consent holder shall verify, at least once every 12 months, that the result of gaseous fluoride testing carried out in permit condition C3.1 is representative of total potline gaseous fluoride roof discharges. This verification shall be completed either by comparison with continuous monitoring instrumentation, or by another method approved by the Council's Director of Environmental Management.
- (b) The consent holder shall verify, at least once every five years, that the results of total particulate, particulate fluoride and sulphur dioxide testing

carried out in permit condition C3.1 are representative of total potline roof discharges. The method of verification shall be approved by the Council's Director of Environmental Management.

- C3.3 The potlines roof total gas flow in  $\text{Sm}^3/\text{minute}$  shall be measured and reported to the Council at five yearly intervals, or at shorter intervals if significant changes in cell operations may have affected the airflows.

#### C4 *Environmental Monitoring*

- C4.1 Guidelines stated in section C4 Environmental Monitoring and its subsections are to apply on land other than Tiwai Peninsula.

The guidelines are to apply to the effects directly pertaining to the discharges authorised in this consent on the consent holder's site.

- C4.2 (a) Fluorides in Ambient Air

- Gaseous and particulate fluorides in ambient air shall be monitored at four sites, as described in the application, using a method based on up to a one month sampling period and producing equivalent results to AS 3580.13.2.
- Gaseous and particulate fluorides shall be monitored at a fifth site, as described in the application, using a method based on a seven day sampling period and producing equivalent results to AS 3580.13.2.
- At sites other than the fifth site, if two consecutive monthly results exceed 0.3 micrograms per cubic metre gaseous fluoride, then the monitoring shall revert from a one month sampling period to a seven day sampling period. Sampling on a monthly time basis may be resumed when two consecutive seven day results are each less than 0.3 micrograms per cubic metre.

- (b) Sulphur Dioxide in Ambient Air

- The consent holder shall monitor for sulphur dioxide in ambient air in one location (as approved by the Council's Director of Environmental Management), if the sulphur content of petroleum coke exceeds 3.5% on a three month rolling average.
- One-hour average concentrations of sulphur dioxide in ambient air shall be measured by instrumental monitoring for at least a 24 month continuous period. The method of measurement shall be in accordance with AS3580.4.1 – 1990) Method 4.1: Determination of sulphur dioxide – Direct reading instrumental method), or an alternative method agreed to in writing by the Council's Director of Environmental Management. The Council's Director of Environmental Management and the consent holder shall agree to any additional monitoring of ambient air sulphur dioxide, after a



report has been provided to Council as required by condition D8 (b).

C4.3 Meteorological conditions

The consent holder shall maintain and operate a meteorological station for the recording of weather conditions likely to affect the way in which the discharges to atmosphere from the plant impact on the environment.

C4.4 Atmospheric Deposition of Fluoride

Deposit gauges are to be operated at seven sites, located as approved by the Council's Director of Environmental Management, using a method based on a one month sampling period. Contents of gauges are to be analysed for fluoride. Guidelines for fluoride in the contents of these deposit gauges (other than those on Tiwai Peninsula) shall be:

Fluoride	0.9 g/m <sup>3</sup>
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C4.5 Pinus Radiata Needles

Needles between one and two years old shall be sampled quarterly at up to three sites on Tiwai Peninsula and at four sites off Tiwai Peninsula. The needles shall be washed and analysed for fluoride. The guideline for fluoride content in these needles shall be 75 mg/kg.

C4.6 Ungrazed Grasses

These shall be sampled monthly at 23 sites, located as approved by the Council's Director of Environmental Management. The unwashed grass samples shall be analysed for fluoride content. The guidelines for fluoride in these samples shall be:

- (i) running averages of monthly samples for a period of 12 months not to exceed 40 mg/kg;
- (ii) the average of any two consecutive months samples not to exceed 60 mg/kg;
- (iii) a monthly sample not to exceed 80 mg/kg more than once in any 12 consecutive months.

C4.7 Grazing Monitor Farms

A series of grazing monitor farms at sites off Tiwai Peninsula, located as approved by the Council's Director of Environmental Management, are to be used for monitoring the effects of discharges to atmosphere on farm livestock. The following monitoring shall be carried out:

➤ Grazed pasture

Grazed pasture shall be sampled monthly at eight sites, located as approved by the Council's Director of Environmental Management. The unwashed

pasture samples shall be analysed for fluoride. The standards shall be those in permit condition B2.2;

➤ Beef Cattle urines

These shall be monitored once per year at one site, located as approved by the Council's Director of Environmental Management. The urine samples shall be analysed for fluoride. The guideline for fluoride in beef cattle urine shall be 10 g/m<sup>3</sup> at SG 1.030.

## Schedule D

### Reporting Requirements

- D1 The results to be reported and the format in which they are to be reported shall be to the requirements of Council's Director of Environmental Management.
- D2 Results are to be reported within 20 working days of the end of the period being reported on, unless stated otherwise, e.g. where results are to be reported monthly, reporting shall be within 20 working days of the end of the calendar month during which monitoring took place.

Where results are for comparison for auditing purposes, they shall be reported as soon as they are available.

Except where the Council acts as the consent holder's agent, the Council may audit the consent holder's monitoring conducted in accordance with the conditions of this consent. The details of the auditing shall be agreed by the Council's Director of Environmental Management and the consent holder. Costs of auditing shall be borne by the consent holder.

- D3 The results of the main stack discharge monitoring under C2.1 and potline roofs discharge monitoring under C3.1 shall be reported monthly.

A three-monthly summary of results, with the consent holder's interpretations of the results, and showing trends, shall be submitted also.

Results shall be reported in kilograms per minute, and the three-monthly summaries shall also include results for gaseous and particulate fluorides in kg/tonne of aluminium produced (raw data and trends).

The toluene soluble content of each pitch shipment received during the three month period, shall be reported with each three monthly summary of results.

- D4 The consent holder shall submit annually, by 31 March each year, the monitoring results of dust collectors, with respect to the limits required by permit condition B1.5 (a).
- D5 The consent holder shall submit annually, by 31 March each year, the verification results of the potline roof gaseous fluoride discharges, as required by permit condition C3.2 (a).
- D6 The consent holder shall submit five yearly, by 31 March of the following year, the verification results of the total potline roof discharges, as required by permit condition C3.2 (b).
- D7 The results of the monitoring required in permit condition C4.2 (a) (fluorides in ambient air), C4.6 (ungrazed grasses) and C4.7 (grazed pastures section only) shall be reported monthly (raw data only), with 3 monthly summaries which include the consent holder's interpretations of results and which show trends.

- D8 (a) The results of monitoring, when required in permit condition C4.2 (b) (sulphur dioxide in ambient air), shall be reported with three monthly summaries which include the consent holder's interpretations of results.
- (b) The consent holder shall prepare a report to assess the effects of ambient air sulphur dioxide of the smelter's discharges at the end of the 24-month monitoring period. The report shall be made available to the Council's Director of Environmental Management within three months of the completion of the 24-month monitoring period.

D9 Reporting requirements for sulphur in fuels and raw materials are set out in permit condition E1.2.

D10 The consent holder shall submit annually, by 31 March each year, a report on the monitoring results of C4.7 during the previous calendar year. The report shall include the consent holder's interpretation of results and shall show trends.

D11 Assessment of vegetation condition

The consent holder shall submit, at five yearly intervals, (or more frequently if required by the Council's Director of Environmental Management) a report on the condition of vegetation both on and off Tiwai Peninsula. The report shall assess the effects of the smelter's discharges to the atmosphere on the health of the vegetation and shall be submitted with an annual report (as per D10).

D12 Meteorological Conditions

Wind roses and rainfall summaries shall be reported three-monthly, with the consent holder's interpretation of how these parameters have affected the way in which the discharges have dispersed and impacted on the environment during the period being reported on.

D13 The results of the monitoring required in permit conditions C4.4 (atmospheric deposition) and C4.5 (pine needles) shall be reported three-monthly with the consent holder's interpretation of the results and showing trends.

D14 Waituna Wetlands

The consent holder shall repeat the investigation of the water quality in a fresh water body within the Waituna Wetland to establish the impact of smelter discharges. The site and extent of the investigation shall be to the satisfaction of the Director of Environmental Management. The investigation shall be completed by the end of 2011.

## Schedule E

### General Conditions

#### E1 *Sulphur in raw materials*

E1.1 The sulphur content of raw materials and fuels used in the process at any one time shall be limited as follows:

Petroleum coke	4% by weight
Pitch	1% by weight
Fuel oils	3.5% by weight

These limits shall apply to:

- (a) the final product composition blended on or off site; and/ or
- (b) the weighted average of the sulphur content of raw materials used in the process.

#### E1.2 Reporting

- (a) The sulphur contents of shipments of petroleum coke, pitch and fuel oils received at the consent holder's premises shall be reported to the Council three monthly.
- (b) Where E1.1 (a) and/or (b) are applicable the sulphur content of the petroleum coke used in the process shall be reported to the Council three monthly.

E2 The ducted discharge of ventilation products from the potroom cells shall be treated for the reduction of total particulate, gaseous fluoride and particulate fluoride unless prior approval is obtained from the Council's Director of Environmental Management.

E3 If the annual rate of aluminium produced for any calendar year exceeds 375,000 tonnes, the consent holder shall review the data used in the *Assessment of Environmental Effects 'Discharge to Air' 2005* and provide an updated assessment of effects, including dispersion modelling results. The updated assessment of effects shall be provided within six months of the date of exceedance of the 375,000 tonnes per year production limit. The Council may review the conditions of consent at no more than annual intervals in accordance with Condition E11. The decision to review the conditions, if any, shall be taken within three months of the due date of the updated assessment of effects.

E4 The consent holder shall consult with the Council prior to making any change to the place or method of discharge of air pollutants, or to the method of operation of plant, works, fuel burning equipment or air pollution control equipment which is likely to cause a significant environmental effect.

The consent holder can apply in writing at any time to the Council's Director of Environmental Management to update or change the Site Layout of Major Discharge Points in Schedule F.

E5 The occurrence of any incident which causes or is likely to cause substantial air pollution of the environment must be notified by an authorised officer of the consent holder to the Council's office or after hours pollution phone line as soon as practicable after it becomes known to the consent holder or one of its agents or servants.

E5.1 Where required by the Council, a written report must be supplied to the Council within 20 working days of any event described in E5. Such a report must include full details of the cause, time and duration of the event, the type, volume and concentration of the contaminants discharged and the remedial action taken to rectify any damage and to prevent a recurrence of such an event.

E6 There shall be no burning of any material in the open. For the practice of open burning at the landfill site there shall be an exemption to this condition for Ministry of Agriculture and Forestry border control requirements and for emergency training requirements.

E7 The consent holder shall inform the Council of any instrument malfunction which may significantly affect the recording and reporting of monitoring results as soon as practicable after the malfunction occurs.

E8 The consent holder shall investigate methods for the continuous measurement of main stack sulphur dioxide discharges. The investigation shall include the feasibility, accuracy and potential cost of such monitoring. A report shall be made available to the Council within 18 months from the commencement of the consent.

E8.1 Depending on the report in E8, the Council may require, after consultation with the consent holder, the installation of suitable continuous monitoring equipment or the instigation of further investigations.

E9 The consent holder shall investigate methods for the continuous measurement of main stack opacity of discharge. The investigation shall include the feasibility, accuracy and potential cost of such monitoring. A report shall be made available to the Council within 12 months from the commencement of the consent.

E9.1 Depending on the report in E9, the Council may require, after consultation with the consent holder, the installation of suitable continuous monitoring equipment or the instigation of further investigations.

E9.2 If E9.1 is required the consent holder shall collect 12 months of main stack opacity data. The consent holder shall report the main stack opacity data to the Council within six weeks of the completion of the 12 month data collection period. The Council, with consultation with the consent holder, may review consent condition B1.3 to include continuous monitoring requirements.

E10 Consent reviews

The Council shall periodically, as listed hereunder, assess the following information relating to discharges to air from the smelter:

- Results of monitoring,
- Reports received in accordance with conditions,
- Any other information received on technical matters relating to the smelting of aluminium and the means of avoiding, remedying or mitigating its adverse effects.

As a result of each of these assessments, the Council may review the conditions of the consent for the purposes specified in Section 128 of the Act, subsections 1(a)(i) and 1(a)(ii).

Except as provided for by Condition E3, the review of conditions, if required, may be undertaken at three yearly intervals from the commencement of the consent.

The decision to review the conditions shall be taken within three months of the due date of each assessment.

## **Schedule F**

Site Layout of Major Discharge Points (attached overleaf)

for the **Southland Regional Council**

W J Tuckey  
**Director of Environmental Management**