HYDRO ALUMINIUM KURRI KURRI PTY LTD

ABN 55 093 266 221
ACN 093 266 221

Pollution Incident and Emergency Response Management Plan

Prepared by and with the authority of

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Regrowth Project WHS Manager

Kerry McNaughton
Hydro Environment Manager

Revision 12: August 2020

CONTENTS

Pollution Incident and Emergency Response Management Plan

Copy Number: _____

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Date: _____

DOCUMENT CONTROL

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AMENDMENT REGISTER

Issue No.	Date of Update	Amendment Details	By Whom	Reviewer/ Review Date
5	3/7/01	New issue – total review to replace Capral Aluminium with VAW.	R Summerville	
6	1/9/04	New issue – total review to replace VAW with Hydro and changed the format. Reviewed Current Best Practices (CBP)	A Edwards	
7	7/12/05	New Issue - Total Review Document changed to come into line with the NSW Department of planning Requirements for Hazardous Industry Planning Advisory Paper No1. Title changed to Emergency Service Cooperation Agreement. Internal use documentation removed.	D.Fatches	
8	13/10/09	Updated document to reflect personnel change and dangerous goods list.	J Firth	
9	11/4/12	Updated document to include details for Pollution Incident Response Management Plan per EPA requirements	AECOM	K McNaughton & A. Fry (22/5/12)
10	20/1/14	Updated document to include new Structure and to remove referral to the PEO organisation from the document.	M Pollard	K McNaughton 28/1/15
11	24/1/17	Updated to reflect current site requirements and conditions.	M Pollard	K McNaughton 24/1/17
12	7/8/20	New Issue - Changed document title to “Pollution Incident and Emergency Response Management Plan” to cover both EPA & DPIE requirements. Updated requirements to reflect current project/site status.	J Brown	K McNaughton 7/8/20

NOTES

* Plan is to be reviewed at least once every 12 months and within one month of the date of any pollution incidents

A copy of this Plan is to be kept on site at all times. The plan is to be made available within 14 days of finalisation on the Hydro website. A free copy must be provided to any person who requests it or is required to implement it. This Plan is to be provided to an authorised officer if requested.

TESTING HISTORY

Testing Date^	Authorised		Date Published#
	Name/Position	Signature	
2016 Jan	M Pollard		Evacuation drill conducted
2017 Jan	M Pollard		Evacuation conducted due to external bushfire
2018 Feb	J Brown		Emergency Drill conducted.
2018 June	J Brown		Emergency Drill conducted
2020 Jan	J Brown		Emergency Drill conducted

NOTES
^ Plan is to be tested at least once every 12 months and within one month of the date of any pollution incidents

EXTERNAL ALERT PROCEDURE AND CONTACT TELEPHONE NUMBERS

Order	Agency	Contact Details
If the incident presents an immediate threat to human health or property		
Fire and Rescue NSW/ NSW Police/ NSW Ambulance Service Give the following information: LOCATION - Town: **Kurri Kurri** - Street: **Hydro (Hart Road)** - Nearest Cross Street: **Dickson Road** TYPE OF EMERGENCY e.g. casualties ASSISTANCE REQUIRED e.g. hazards TELEPHONE CONTACT NUMBER		000
Neighbours (if potentially affected)		Refer to Tenant Details.
If the incident does not require an external emergency agency, or once the 000 call has been made, notify the relevant authorities		
1	Environment Protection Authority (EPA)	**131 555**
2	NSW Health (via the local Public Health Unit)	**02 4924 6477** (Fax: 02 4924 6490); after hours the phone diverts to John Hunter Hospital - ask for the Public Health Officer on call
3	Safe Work NSW	**13 10 50**
4	Cessnock City Council	Business Hours: **4993 4100** After Hours Emergency: **4940 7816**
6	Department of Planning, Industry and Environment	Business Hours: **4904 2700** (Newcastle Office)

Direct Line Numbers:

Fire Brigade	Kurri Kurri	4937 1025
	Weston	4937 1071
	Cessnock	4991 4150
Police	Kurri Kurri	4937 1593
	Cessnock	4990 1199
Ambulance	Kurri Kurri	4961 6555
	Cessnock	4090 1633
Hospitals	Kurri Kurri	4937 1066
	Maitland	4939 2000
	JHH (Newcastle)	4921 3000
	Cessnock	4990 1166
Newcastle Gas Co.	Newcastle	4926 8888
Hunter Water Corporation	Newcastle	4926 7267
State Emergency Service	Cessnock	4990 4222

In the event of an emergency, the Hydro Managing Director or nominee, may be required to contact Hydro head office:

Hydro Emergency Team -	+47 22 53 82 20
Hydro Press Officer on call -	+47 22 53 82 10

In the event of an emergency on site occurring after hours, the following key Hydro personnel need to be notified:-

HAKK Managing Director	Ph. 0439 139 059	Richard Brown
Regrowth Project Manager	Ph. 0408 467 506	Andrew Walker
Regrowth Construction Manager	Ph. 0419 708 090	Andrew Solomou
Regrowth Safety Manager	Ph. 0409 552 379	James Brown
Hydro Environment Manager	Ph. 0408 863 185	Kerry McNaughton

In the case of a pollution incident, the Protection of the Environment Operations (POEO) Act, specifies that notifications to the relevant authorities are to include the following information where known:

- **Time, date, nature, duration and location of the incident;**
- **Location of the place where pollution is occurring or is likely to occur;**
- **Nature, the estimated quantity or volume and the concentration of any pollutants involved, if known, the circumstances in which the incident occurred (including the cause of the incident, if known); and**
- **The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution, if known.**

If any of the information above is not known at the time of the initial notification but becomes known afterwards, that information must be notified immediately after it becomes known.

Neighbours should be notified where there is a possibility that their health or property may be at risk from the incident. Notification should be made as soon as possible, and regular updates should be provided as additional information becomes available, and should include:

- details of the nature of the incident;
- actions being taken to address the incident;
- whether there is any risk to health; and, if so,
- how they might be exposed such that recommendations can be made as to how exposure can be minimised.

In determining the extent of community notification for potential air emissions, the Hydro Management Team should consider aspects such as the type of pollutant, prevailing winds, height and magnitude of an emission, as well as the location of any on-site fallout or off-site impacts, the likelihood of the pollutant reaching ground level, and possible impacts on sensitive receptors.

Details of the addresses, names and contact details of the potentially affected residences are shown below. Land ownership is shown in the following figure.

Property Address	Tenant Name	Contact Telephone Number
Hydro-owned Houses		
14 Bowditch Ave, Loxford	Peta Anderson	4937 1179
18 Bowditch Ave, Loxford	Paul Maskey	0418 244 272
14 Horton Rd, Loxford	Winsome Rissler	4936 4144
10 Dawes Ave, Loxford	Tenneil Mitchell	0450 736 080
1 McLeod Rd, Loxford	David Mitchell	0400 223 727
Wangara House, Cliftleigh	Rob Hallett	0409 245 546
Wangara Residence, Cliftleigh	Glen Winchester	0481 185 477
Privately Owned Houses		
2 Bowditch Ave, Loxford	Max Lindsay	4936 1477
2a Bowditch Ave, Loxford	Graham Lindsay	4937 5235
4 Bowditch Ave, Loxford	Ron Austin	4937 1139
6 Bowditch Ave, Loxford	Unknown	N/A
20 Bowditch Ave, Loxford	Mitchell Luke	0427 988 853
6 Dawes Avenue Loxford	Brad Wood	0431 801 502

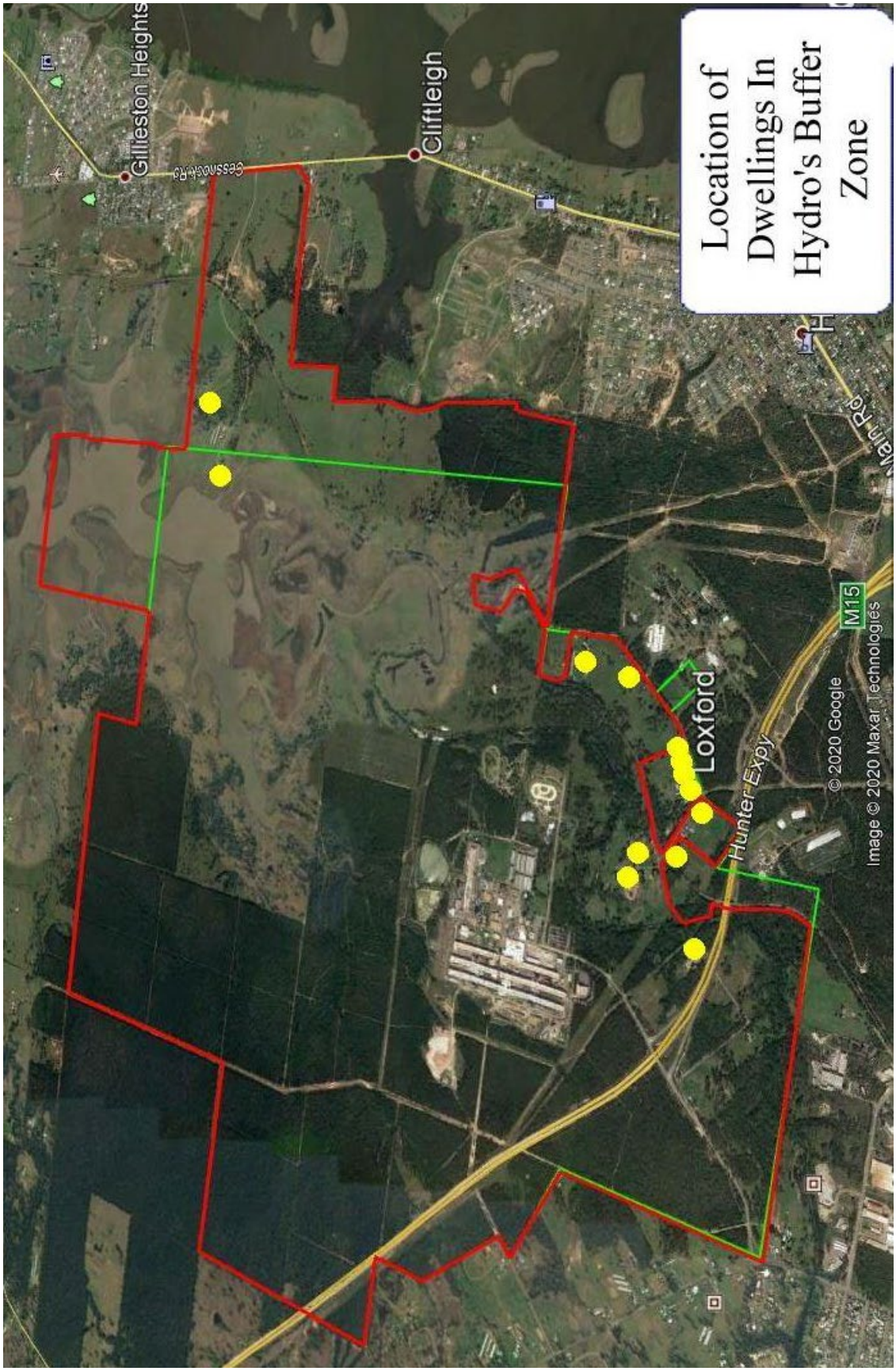


Figure 1 – Land Ownership

1.0 INTRODUCTION

Since 2012 Hydro Aluminium Kurri Kurri Pty Ltd has been undertaking the decommissioning, demolition and remediation of its former aluminium smelter at Kurri Kurri, together these activities are designated as the Regrowth Project which is managed and supported by a small number of personnel located at the former smelter site. The purpose of this management plan is to guide Hydro's response to pollution incidents and emergency situations.

The Plan has been prepared in accordance with the Department of Planning, Industry and Environment's Hazardous Industry Planning Advisory Paper No. 1 - 'Emergency Planning' and the EPA publication 'The Guideline: Pollution Incident Response Management Plans (PIRMP Guideline)'.

The Plan sets out the onsite structure to apply in the event of an emergency and/or pollution incident and summarises the actions to be taken by people with specific responsibilities`

The initial response to an emergency and/or incident will be the responsibility of the Regrowth Project Manager or nominee, if the Regrowth Project Manager or nominee cannot be contacted within 2 minutes of the emergency, personnel are to contact the Emergency Services on 000, the remaining Hydro team members, contractors and visitors being generally required only to evacuate when instructed to the nominated signposted evacuation area.

The assistance of the external emergency services should be requested even if there is only a slight chance they will be required. Prompt mobilisation could save a life.

Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) holds an Environment Protection Licence No. 1548 for the Former Aluminium Smelter site located at Loxford NSW. As per the *Protection of the Environment Operations Act 1997* (the POEO Act), the holder of an Environment Protection Licence must prepare, keep, test and implement a pollution incident response management plan (PIRMP) that complies with Section 153C of Part 5.7A of the POEO Act in relation to the activity to which the licence relates. The plan is required have the following content:

- the procedures to be followed by the licence holder or occupier of the premises in notifying a pollution incident to certain persons;
- a detailed description of the action to be taken, immediately after a pollution incident, by the licence holder or occupier of the premises, to reduce or control any pollution;
- the procedures to be followed for co-ordinating, with the authorities or persons that have been notified, any action taken in combating the pollution caused by the incident and the persons through whom all communications are to be made; and
- any other matter required by the regulations, including: details regarding identified hazards at the site, and the likelihood and risk of the hazards; an

inventory of pollutants on site; staff responsibilities; mechanisms for notifying residents in the vicinity of the premises; site maps; harm minimisation/mitigation measures; and details regarding how the plan will be made available to the public and authorised officers, as well as testing and review procedures.

2.0 DETAILS OF THE PLAN

This section provides a general description of the works and a framework for dealing with emergencies and incidents from initiation to official enquiries after an incident.

2.1 Scope

Definition of Situations Covered

- An emergency is a situation:

  - which may not be contained immediately by the people on duty using the available resources
  - where injuries have been or could be incurred
  - where damage has occurred or property is placed in jeopardy, or
  - where the impact has the potential to result in serious environmental consequences.

  An emergency can be described as an abnormal or dangerous situation needing prompt action to control, correct and return to a safe condition.

  If there is any doubt, an event should be treated as an emergency. For example, all fires must be treated as emergencies.

- A pollution incident includes a leak, spill or escape of a substance, or circumstances in which this is likely to occur.

The Aims of the Preparation of this Plan

- To decrease the level of risk to life, property and the environment; and
- To control any incident and minimise its effects.

2.2 Purpose of Plan

- To provide an overview of actions considered necessary to control and limit the effect of any emergency that may happen on the Kurri Kurri site or on neighbouring areas.

- To facilitate emergency response and to provide such assistance on the site as is appropriate to the occasion.

- To ensure communication of all vital information as soon as possible.

- To facilitate the reorganisation, clean up and reconstruction after an emergency so that normal operations can be resumed.

- To provide a basis for periodic review and update of emergency procedures for the Kurri Kurri site activities and Regrowth Project Works.

2.3 Emergency Service Providers

Recognition of Emergency Service Providers, which may be tasked to an emergency at our works site

NSW Fire Brigades

NSW Rural Fire service

Police: The control of external roadways, pedestrians and vehicle control as well as serious accident investigations on behalf of the coroner is the responsibility of the NSW Police Department.

Ambulance: If any injuries occur (other than minor injuries that can be treated on site).

Note: If several people have been injured or killed, immediate steps are to be taken by Senior Ambulance Personnel to implement the NSW Disaster Medical Plan. The Regrowth Project Manager or nominee should liaise with Ambulance Personnel to ensure the appropriate use of this facility.

Police Emergency Operations Centre (EOC): May be utilised in the event of a major disaster.

Local Hospitals are to be contacted if people are seriously injured and need hospital treatment.

State Emergency Service

The appropriate regulated emergency service provider will be contacted normally through a 000 call.

2.4 **Dangerous Goods** - Products Stored or Used at Hydro Kurri Kurri Plant

Spent Potlining carbon material is stored in the SPL Sheds 1 to 10 located at the south east corner of the plant. Refer drawing OC-30040.

A Safety Data Sheet for each of the dangerous goods can be found in Appendix B of this Plan. Safety Data Sheets for all materials on site are stored on the Hydro Sharepoint system. Printed copies of SDS's are also provided to personnel undertaking the recycling works.

2.5 Emergency Services Assistance

On discovering an emergency situation/pollution incident or a situation which is likely to give rise to an emergency/pollution incident, the Regrowth Project Manager or nominee will AUTHORISE OR CONFIRM the need for external assistance.

NOTE: The following types of emergency are always to be treated as EXTERNAL ALERTS.

If the Regrowth Project Manager cannot be contacted within two minutes of the incident being identified all incidents are to be treated as EXTERNAL ALERTS.

- Fire - after assessment by the onsite personnel.
- Any accident requiring transport of an injured person to immediate offsite medical assistance (such as hospitalisation) or involving more than one person.
- Any instance of a person or persons being overcome by fumes or lack of air.
- Any pollution incident that causes or threatens material harm to the environment. (Material harm, as defined under Section 147 of the POEO Act 1997, includes actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial or that results in actual or potential loss or property damage of an amount over $10,000.)

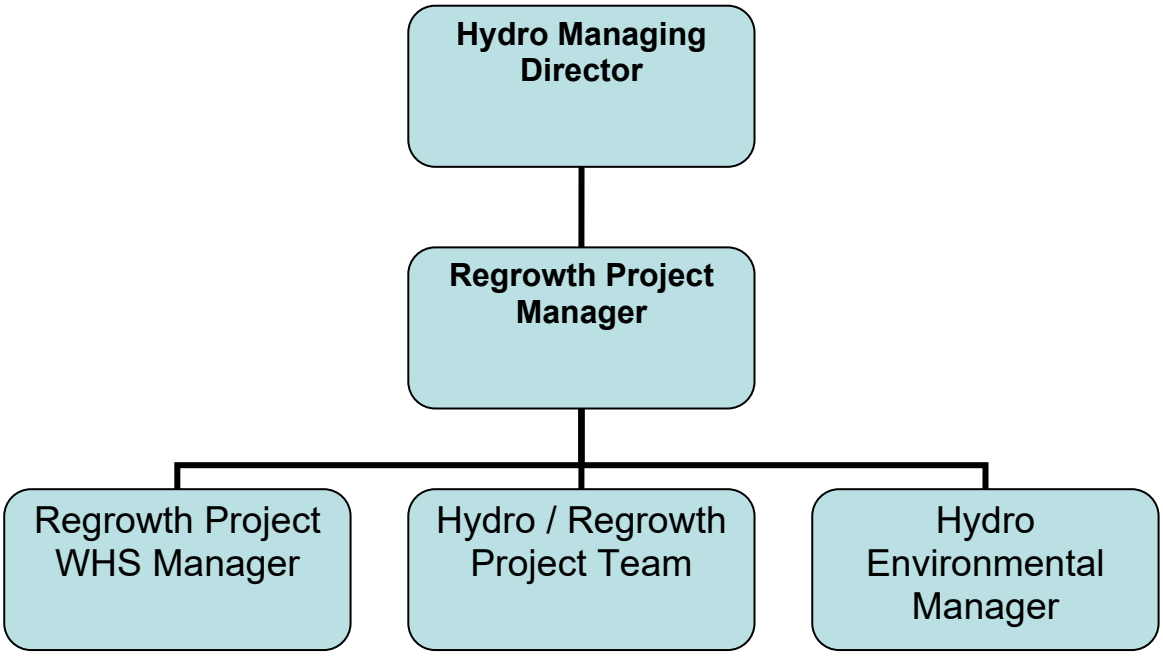
2.6 Emergency Response and Control

2.6.1 In the Event of an Emergency:

The Regrowth Project Manager or nominee is to be contacted to assess the nature and extent of the emergency, the Emergency Services will be called in as required, where the Regrowth Project Manager or nominee cannot be contacted within 2 minutes, the Emergency Services are to be contacted directly

NOTE: Evacuations must be the priority in most emergencies.

EMERGENCY RESPONSE STRUCTURE



2.6.2 Emergency Response Command Structure during an External Alert

If the emergency situation develops into an “EXTERNAL ALERT”, handover of the emergency co-ordination to the Public Emergency Commander (Fire Brigade, Ambulance or Police Officer attending – see later notes) will occur. However, the Regrowth Project Manager or nominee must act as an advisor/liaison officer to the Public Emergency Commander, especially with regard to site hazards and how best to minimize these during the emergency.

2.6.3 Communications

The primary method of communication is via mobile phone.

Dependent on the emergency being reported, a nominated person will escort the incoming emergency service to the incident scene or give suitable directions to an Emergency command centre (if required).

2.6.4 Emergency Command Centre

Dependent on the emergency location and type, the Main Administration building 21A can be utilised as an emergency command centre. A command centre in this location could also be utilised as a media centre.

2.6.5 Emergency Off Site Transport of Dangerous Goods

All dangerous goods transported off site are accompanied by a Safety Data Sheet. In the case of emergencies these should be referred to the Regrowth Project Manager. A copy of the Safety Data Sheet is included in this Plan. On site contact is the Regrowth Project Manager or nominee.

2.6.6 Control of Contractors on Site

Work permit procedures are applied to all contractors. Hydro staff supervises their activities whilst on site. Short-term visitors are accompanied all the time.

Other contractors, acting as a nominated Principal Contractor, as defined under the WHS Act and Regulations, are required to have their own Emergency Management Plans that are at least the equivalent of this plan.

2.7 Interaction with Emergency Services and Relationships to Existing Plans and Procedures

As noted in Section 2.6.2, control over an incident is to be handed to the Senior Public Emergency Service officer immediately upon their arrival.

This Hydro Aluminium Kurri Kurri Emergency Plan is to supersede all previous Plans for the works. It is to be read in conjunction with the following documents:

- Hydro Aluminium Kurri Kurri Work Health and Safety Management Plan: Smelter Demolition and Remediation
- Hydro Aluminium Kurri Kurri Smelter Decommissioning, Demolition and Remediation Environmental Management Plan

2.8 Notification of Authorities and Neighbours

The Regrowth Project Manager or nominee will contact the Public Emergency Services (Police, Fire Brigade and Ambulance) and the Hydro Environmental Manager (or nominee) will contact neighbours as appropriate.

For the purposes of section 149 of the POEO Act, a pollution incident that is required to be notified:

- is to be notified verbally to each relevant authority, and

- is to be followed by notification in writing within 7 days of the date on which the incident occurred.

The written notification is to be undertaken by or under the direction of the Hydro Environmental Manager.

In determining the extent of community notification for potential air emissions, the Hydro Environmental Manager in consultation with the Hydro Management Team should consider aspects such as the type of pollutant, prevailing winds, height and magnitude of an emission, as well as the location of any on-site fallout or off-site impacts, the likelihood of the pollutant reaching ground level, and possible impacts on sensitive receptors.

Early warnings should be provided as soon as a potential threat to neighbouring properties is identified. This should be in the form of a telephone call, where possible, to provide sufficient timely detail to potentially affected persons.

In cases where an actual immediate threat to neighbouring properties is identified, all means available should be used to ensure the affected parties are notified. This would be undertaken in a hierarchy of contact mechanisms, starting with telephone calls then door-knocking, followed by a letterbox drop about the threat.

For more general or less acute threats, letterbox drops may be sufficient.

Follow-up contact should be made as appropriate, providing information regarding on-going actions being undertaken, the nature of any on-going threat, and notification of resolution of the issue.

In all instances, relevant details should also be posted on the Hydro website. Information provided to neighbours should include details of the nature of the incident; potential effects of the incident on their health or property; and instructions specific to the nature of the incident to minimise the risk of harm from the incident (e.g. closing windows/doors and staying inside in the event of an air release; avoiding the use of water sources potentially affected by a pollution discharge etc.).

Communication mechanisms must be coordinated with emergency services personnel managing the incident response.

Further information is provided in the External Alert Procedure and Contact Telephone Numbers at the start of this plan.

If the Regrowth Project Manager or nominee cannot be contacted within two minutes of the first alarm, all incidents are to be treated as EXTERNAL ALERTS.

2.9 Internal Emergency Resources

The following emergency resources are available.

(a) Fire Fighting Water Supplies

A 200mm branch main off the Hunter Water supply main to Kurri Kurri brings water to the site in the form of a hydrant located adjacent to Building 55C.

In an emergency, all non-essential functions are closed down to conserve water for firefighting purposes.

(b) Fire Protection Systems and First Aid Fire Fighting Equipment

Areas of the plant where significant fire risk occurs are provided with fixed systems, being either: Water deluge, sprinklers, CO2, Inergen, hydrants, hose reels, extinguishers or any combination of these as required.

2.10 Emergency Communications

2.10.1 Alarms

There are a limited number of fire detection and alarm panels located around the works. The table below provides a list of the remaining systems:-

Building No.	**Description**	**Wormald Fire Alarm Monitoring System?**	**ADT Remote Monitoring System?**	**Suppression System**
12A	1ML Fire Water Tank & Diesel Fire Pumps	Yes	Yes	Dry Chemical Fire Extinguishers
21A	Administration Building	No	No	Dry Chemical Fire Extinguishers & External Hydrants
26A	Substation	Yes	To be installed	Dry Chemical Fire Extinguishers
26C	Substation	Yes	To be installed	Dry Chemical Fire Extinguishers
32A	Compressor House / Workshop	Yes	To be installed	Dry Chemical Fire Extinguishers
29A	Switchyard Control Room	Yes	Yes	CO_2 Gas Suppression System
29B	Switchyard Switchroom	Yes	Yes	Inergen Gas Suppression System
29C	Switchyard Control Room	Yes	Yes	Inergen Gas Suppression System
38A	11kV Switchroom	Yes	Yes	Sprinkler System Supplied from 12A

Building No.	Description	Wormald Fire Alarm Monitoring System?	ADT Remote Monitoring System?	Suppression System
				Pumphouse
38C	11kV Switchroom	Yes	Yes	Inergen Gas Suppression System
55C	Personnel Training Centre	No	No	Dry Chemical Fire Extinguishers & External Hydrants
92A	Switchyard Workshop	Yes	Yes	Dry Chemical Fire Extinguishers
93A	Switchyard Offices	Yes	Yes	Dry Chemical Fire Extinguishers

If a fire is detected in a building where a fire alarm monitoring system is fitted, a pulsating alarm sounds in the affected area; a constant alarm sounds in all other areas of the Works. As a result of the demolition of the main gatehouse, Hydro is currently in the process of fitting remote monitoring to all active fire alarm panels. A notification of a fault or alarm will be sent via SMS to several Hydro Management Team members. Members will respond to these alarms to determine the exact location of the fire.

2.10.2 Telephones

All telephone communications are via mobile phone. Telephone numbers of site personnel and neighbouring properties which have telephone facilities are provided in the “External Alert Procedure and Contact Telephone Numbers” section at the start of this plan.

2.10.3 2-Way Radios

The Regrowth Project Team are issued with 2-way radios.

NOTE: Two-way radios shall not be used within 30m of a suspected bomb.

2-way radio channels are allocated as follows:

Channel 17 - for all radio communications

2.11 Evacuation

The order to evacuate all or part of the site will be given by the Regrowth Project Manager or nominee.

Upon the order to evacuate, all staff will assemble at the designated assembly point which is located on the grass at the south end of the Main Administration Building 21A.

2.11.1 Procedure for Terminating an Emergency

In an emergency involving external emergency services, when the Public Emergency Service Commander's role is complete, he/she will hand back control to the Regrowth Project Manager or nominee.

The Regrowth Project Manager or nominee will assess the situation and decide on any additional actions to be completed before declaring the termination of the emergency.

The Regrowth Project Manager or nominee will arrange for clean up of any spill and safe disposal of any contaminated material resulting from the emergency.

2.12 Emergency Counselling

Hydro Aluminium will offer counselling and if required will select the appropriate level of assistance.

2.13 Public Relations and Debriefing

It is important that care be taken in the manner in which the public generally, and the press in particular, are dealt with.

The Hydro Managing Director or his nominee is the nominated spokesperson to handle the matter, other staff should not offer any comments on the incident. It is important that all on-site staff keep the spokesperson informed of any change in the situation.

Name or names of persons involved in an accident are not to be released to the media until the next of kin have been informed. Special care must be taken to verify that the next of kin have, in fact, been informed before the press are advised.

Almost invariably, the press will desire to gain access to the works area. This is usually undesirable and should be refused in a firm but tactful manner.

2.14 Statutory Investigation

Following any pollution incident or emergency, a statutory investigation may be held. A coronial inquiry may also be held in the case of fire and will be held in the case of fatalities.

The Regrowth Project Manager or nominee must make sure there will be no interference with physical evidence except that which is necessary to bring the emergency under control (to protect worker safety and to avoid environmental impacts). Following an emergency that requires a coronial enquiry, a clean up must not start before approval is received from investigating officers.

A senior Police Officer will be appointed to take charge of all aspects of the follow-up of an emergency that may later result in a coronial inquiry (as described above).

2.15 Training and Evaluation

The Hydro team members are trained in first-aid and hold current first aid certificates. They will periodically be given refresher courses.

2.16 Review and Revision of Plan

The Plan will be updated after any emergency occurs to include experience gained during that emergency. It will also be revised when there are significant changes to nominated staff, equipment or materials. The Regrowth Project Manager is responsible for initiating reviews of the Plan and authorising any changes.

INTERNAL PROCEDURES

3.0 EMERGENCY RESPONSE PROCEDURES

3.1.1 Regrowth Project Manager

The essential functions of the Regrowth Project Manager are set out below.

Assume absolute responsibility for all activities on site from when an emergency alarm is initiated to when the state of emergency no longer exists or when control of the emergency is handed over to the appropriate Public Emergency Service Commander.

Issue and follow up instructions to designated people to contact the emergency services, as appropriate.

. Contact neighbours.
. Direct emergency control and clean-up operations as appropriate.
. Ensure that responsibility for site operations is formally handed back to operations staff at the appropriate point.

3.1.2 Emergency Procedures and Information for the Traffic Controller (Regrowth Project Team)

On hearing the fire alarm:

- Assume traffic control duties. Prevent vehicles, other than those authorised, from entering the Works. Direct emergency response vehicles to the internal emergency resources and/or the emergency location.
- Ensure driveway and entry and exit gates are clear at all times.
- Obey the Regrowth Project Manager or nominee.
- Stop any person re-entering the Works who is not part of an emergency response unit.

3.1.3 Emergency Procedures and Information (Regrowth Project Team)

On Hearing the Fire Alarm in their building, or if directed by Regrowth Project Manager or nominee:

- Evacuate all personnel - check all toilets.
- Exit only when the Section has been cleared.
- Conduct roll call in conjunction with the Evacuation Controller.
- Prevent re-entry to the Section
- Obey the Regrowth Project Manager or Public Emergency Service Commander.

3.1.4 Emergency Preparedness Site Instructions

- All internal and external access roads must be kept clear.
- A complete set of Safety Data Sheets for hazardous materials handled in bulk on the site must be kept at all times in the Weighbridge Office (EBA Room 21A)
- There must always be two clear paths to the site of any potential emergency for access by emergency vehicles. (Main Gate, South Gate, East Gate)

The assistance of the NSW Ambulance Service, Fire Brigade, Police or Volunteer Rescue Association, should be requested even if there is only a slight chance they will be required. Prompt mobilisation could save a life or minimise major loss.

4.0 **SITE LAYOUT DIAGRAMS**

The below site plans and diagrams are provided on the following pages:

- Figure 2 - Site Location
- Figure 3 - Site Layout / Road and Building Directory, Dwg. OC-30040
- Figure 4 - WorkCover Dangerous Goods Plan, Dwg. OA-30135
- Figure 5 – Emergency Evacuation Assembly

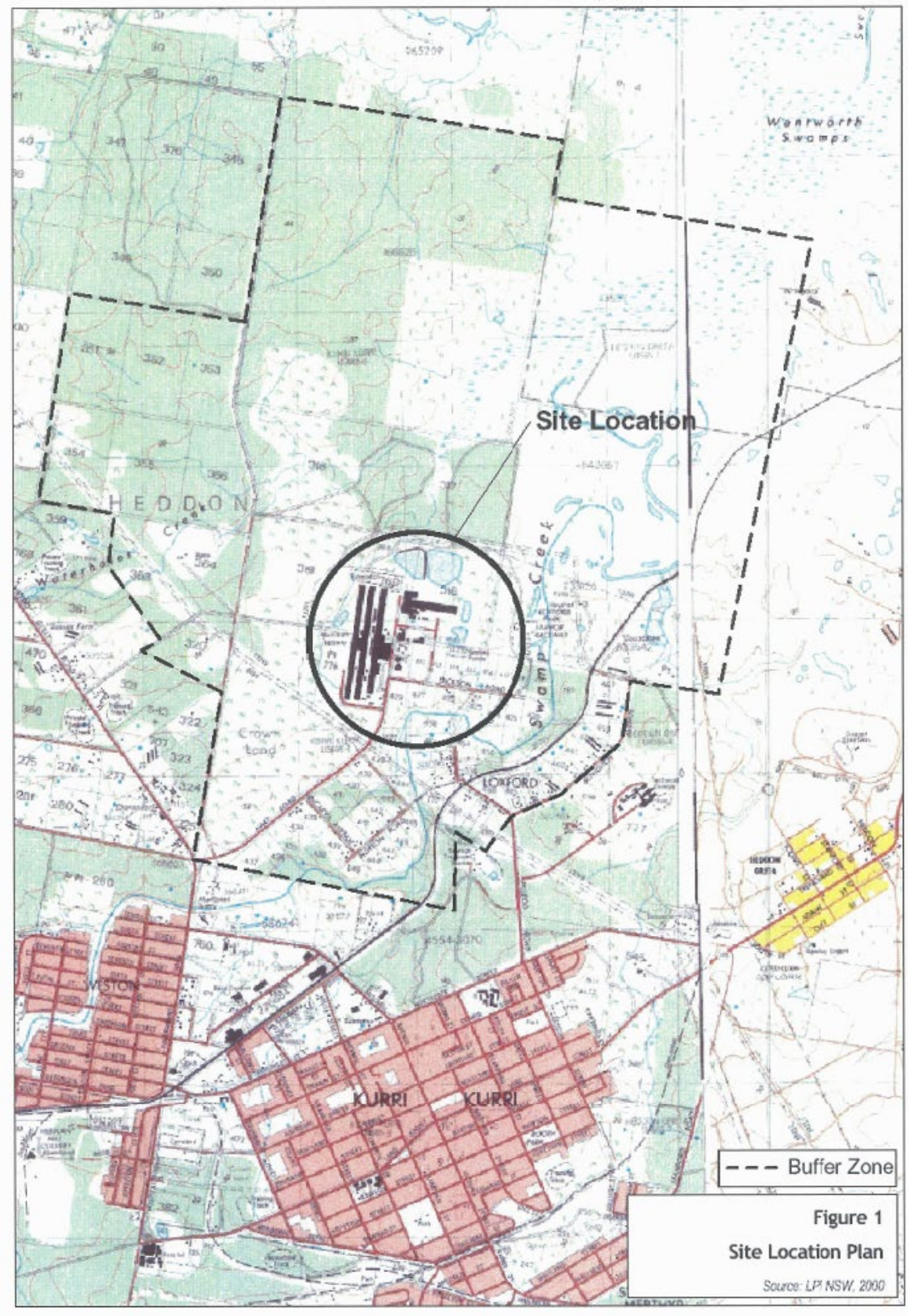


Figure 2 Site Location

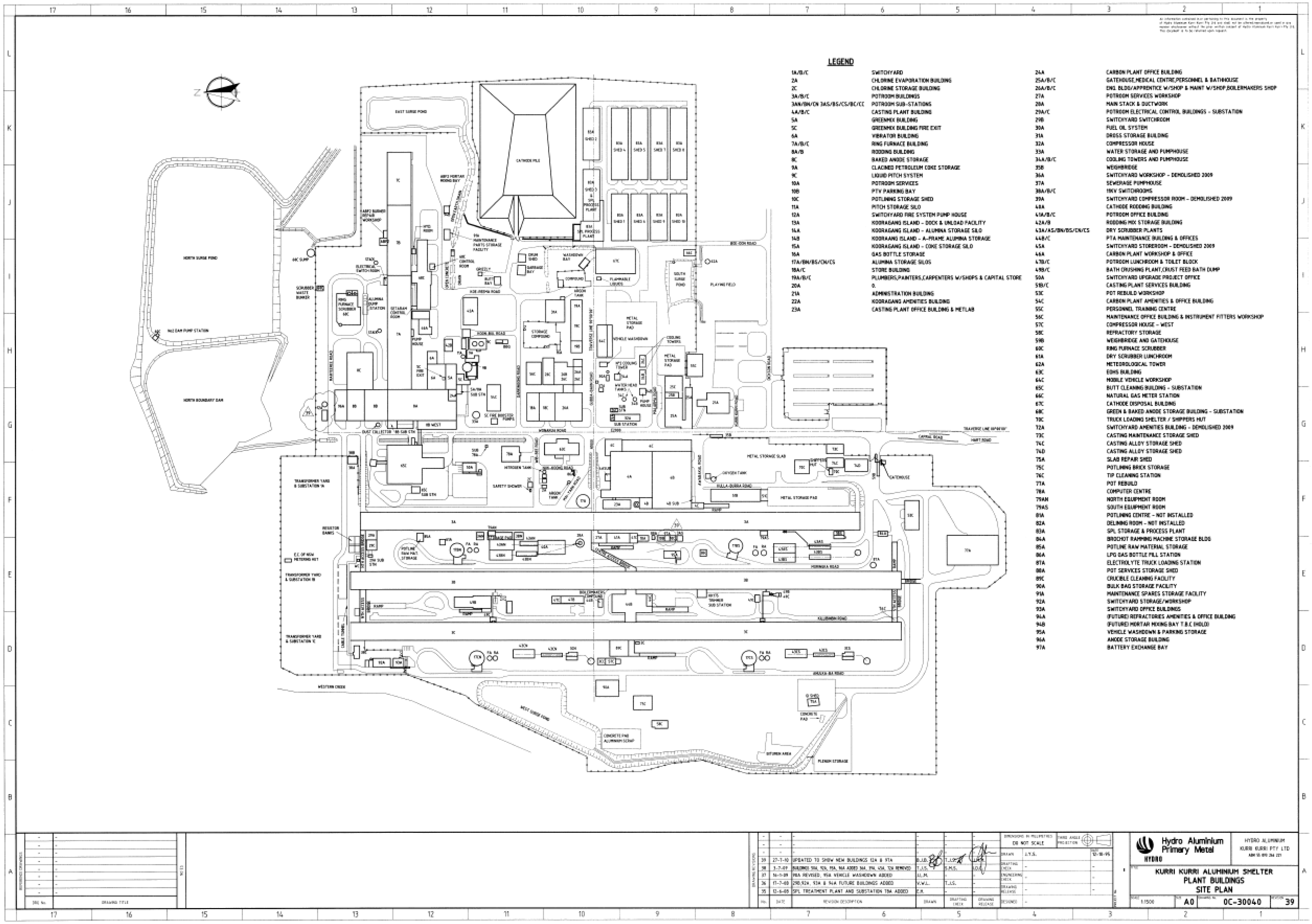


Figure 3 Site Layout / Road and Building Directory

Figure 4 Dangerous Goods

Figure 5 Emergency Evacuation Assembly

5.0 MANAGEMENT

5.1 Management Structure and Responsibility

The Regrowth WHS Manager along with the Hydro Environmental Manager are responsible for the implementation and maintenance of this plan.

All site personnel have some responsibility for safety and environmental performance. All staff are made aware of their general safety and environmental responsibilities through the site induction process, and are required to comply with their designated responsibilities as defined in the WHS Plan, Environmental Management Plan (and associated supporting plans) and/or Contracts and/or specific SWMS and risk assessment documents.

5.2 Keeping and Publication of this Plan

A copy of this Plan is to be kept at the Hydro facility at Hart Road, Loxford. This Plan is to be published on the Hydro website within 14 days of finalisation (details of neighbours may be removed from the publicly accessible version to protect privacy). A free copy must be made available to any person who requests it. The Plan is also to be provided to an authorised officer if requested.

5.3 Document Control

Hydro Aluminium will control this document using the standard set out below:

- Document layout and format;
- Document labelling;
- Issue numbers and dates / revision control;
- Authority to approve; and
- Distribution lists.

All controlled documents issued to staff and contractors are recorded via the document transmittal system. The name and date that the document was issued is recorded for future reference.

Printed copies are uncontrolled..

5.4 Testing of this Plan

This Plan is to be tested through assessment and review, followed by amendments to the Plan where necessary. Testing is to be conducted:

- at least once every 12 months, and
- if a pollution incident occurs at or from the premises – within 1 month of the date on which the pollution incident commenced.

The testing and assessment process is to include the following activities:

- Auditing of the Plan to determine whether it addresses all the requirements of the POEO Amendment Act, including any revisions or amendments to that Act that may occur in the future;
- Auditing of the Plan to determine that the information contained within it is correct and accurately reflects the relevant systems and procedures on site;

Testing of the Plan, which is to include desktop simulations and an incident drill to assess how staff respond to an incident and determine whether the Plan actions are followed and are effective. The testing also includes assessing the effectiveness of training.

Documenting each test of the PIRMP will be undertaken using the 'Emergency Evacuation Exercise Observer's Check List' provided in Appendix C. This document details the date the test was undertaken, the area affected, the response times, areas for improvement and general comments

5.5 Implementation of this Plan

If a pollution incident occurs in the course of an activity so that material harm to the environment (within the meaning of section 147) is caused or threatened, this Plan must be immediately implemented in accordance with the procedures contained within this document.

Material harm as defined under Section 147 of the POEO Act includes actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial or that results in actual or potential loss or property damage of an amount over $10,000.

5.6 Training

All employees must undergo training about their responsibilities under this plan. Such training should be incorporated into the site induction process.

The training requirements for employees are summarised in the following sections. Details of this document should be included in all training areas where applicable.

5.6.1 Inductions

Before being allowed to undertake work on-site, all staff and contractors are required to undergo a site induction. The Hydro Site Induction requires all attendees to pass a written examination. Each designated Principal Contractor, as defined under the NSW WHS Act and Regulations is responsible for providing their own site specific induction, that includes emergency response and pollution incident management provisions and as a minimum the induction must meet the requirements of this management plan.

5.6.2 Contractors

The WHS and environmental background of contractor companies is researched before they are approved on site, and Hydro procurement processes require that contractors meet all appropriate site environmental requirements.

Before being allowed to undertake work on-site, all contractors are required to complete the site induction. All contractors are required to work under Hydro environmental controls and comply with Hydro incident reporting systems, including this PIERMP.

5.7 Review

This PIERMP is a continually revised document, which, under legislation, must be reviewed at least once every 12 months and within 1 month of any pollution incident. This document is also updated in response to other key triggers, such as:

- Changes to legislation;
- Changes to management staff, systems or processes;
- Implementation of audit recommendations; and
- Implementation of actions with environmental outcomes.

The master copy is maintained by the Hydro Environmental Manager. Any printed copies are uncontrolled. The Hydro Environment Manager is responsible for ensuring that appropriate revisions, amendments, additions to and deletions from this document are carried out as approved by smelter management.

The following details must be recorded in the Amendment Register at the front of this document:

- Date of review and staff who conducted the review; and
- The person responsible for updating the plan, and the date on which the updates occurred.

APPENDIX A – HAZARDS

Hazards at the site consist of general hazards, dangerous goods, process hazards and equipment. Potential hazards at the site primarily relate to the storage, handling and use of dangerous goods.

The Hazard Risk Register identifies the hazards and risks on site. The risks are categorised by type of hazard and described in terms of the following categories:

- Major hazard category;
- Work area (known exposure location);
- Hazard;
- Risk description;
- Legislation, regulations and other requirements;
- Initial risk rating;
    - Consequence;
    - Probability (i.e. likelihood of hazards occurring);
    - Risk level;
- Control Measures (i.e. hazard and safety control measures);
- Residual risk rating;
- Implementation;
    - Actions required;
    - Responsibilities;
    - Date required;
    - Completion date;
- Review;
    - Review date;
    - Reviewer;
    - Effectiveness of controls;
    - Further actions required; and
    - Sign off.

Process Hazards

In the event of an incident occurring in the Switchyard or Substations, there is transformer oil present.

Pollutant Inventory (Dangerous Goods)

An inventory of pollutants at the site is provided on the following page, which includes the typical quantity of each material stored on site. The locations of the storages are shown in Figure 4 – Dangerous Goods Plan.

DANGEROUS GOODS MANIFEST – 2020

HYDRO ALUMINIUM KURRI KURRI PTY LTD

Depot No.	Type of Store	DG Description	U/N No.	Class	Qty Stored (Typical)
1A/B/C	Process Vessel (Transformers) Note: maximum storage and typical storage are the same for transformers	39A-TM1 - Comb. Liquid 39A-TM2 - Comb. Liquid 39A-TM3 Comb. Liquid 39A-TM4 Comb. Liquid	00C1 00C1 00C1 00C1	C1 C1 C1 C1	15,000L 15,000L 12,300L 12,300L
83A1	Roofed Store (max. - 8,000,000 kg)	Aluminium Smelting By-Products (SPL)	3170	4.3	7 700 t
83A2	Roofed Store (max. - 8,700,000 kg)	Aluminium Smelting By-Products (SPL)	3170	4.3	3 000 t
83A3	Roofed Store (max. - 8,700,000 kg)	Aluminium Smelting By-Products (SPL)	3170	4.3	nil
83A4	Roofed Store (max. - 11,000,000 kg)	Aluminium Smelting By-Products (SPL)	3170	4.3	8 700 t
83A5	Roofed Store (max. - 11,000,000 kg)	Aluminium Smelting By-Products (SPL)	3170	4.3	8 700 t
83A6	Roofed Store (max. - 8,000,000 kg)	Aluminium Smelting By-Products (SPL)	3170	4.3	8 100 t
83A7	Roofed Store (max. - 11,000,000 kg)	Aluminium Smelting By-Products (SPL)	3170	4.3	6 800 t
83A8	Roofed Store (max. - 8,000,000 kg)	Aluminium Smelting By-Products (SPL)	3170	4.3	6 700 t
83A9	Roofed Store (max. - 8,000,000 kg)	Aluminium Smelting By-Products (SPL)	3170	4.3	5 700 t
83A10	Roofed Store (max. - 8,000,000 kg)	Aluminium Smelting By-Products (SPL)	3170	4.3	2 200 t

APPENDIX B - SAFETY DATA SHEETS

Spent Pot lining (Hydro Aluminium)

SAFETY DATA SHEET SPENT POTLINING FIRST CUT

Business or Trading Name	Hydro Aluminium Kurri Kurri Pty Ltd	**Facility Name:**	Hydro Kurri Kurri Aluminium Smelter
Postal Address	P.O. Box 1. Kurri Kurri. NSW. 2327.	**Address:**	Kurri Kurri Smelter Hart Rd Loxford NSW 2327 Australia
ABN	55 093 266 221	**Description of Material**	Spent Potlining Material – First Cut

1. IDENTIFICATION OF MATERIAL AND SUPPLIER

1.1 Product Identifier & Identity For The Chemical

Spent Potlining First Cut

1.2 Other Means Of Identification

Spent Cell Liner; Pot Lining Waste

1.3 Recommended Use Of The Material & Restrictions On Use

There are no recommended uses of the material which is a waste product of the aluminium production process.

1.4 Suppliers Name, Address & Telephone Number

Generator:
Hydro Aluminium Kurri Kurri'
P.O. Box 1,
Kurri Kurri. NSW. 2327.
Telephone: 02 49371555
Email: richard.brown@hydro.com
Emergency Telephone Number- 02 49371555

2. HAZARD IDENTIFIER

2.1 Classification Of The Hazardous Chemical

Classified as Hazardous: Safe Work Australia "Classification Of Hazardous Chemicals Under The WHS Regulations" (the WHS Regulations)

2.2 Label Elements Including Precautionary Statements Identified In The WHS Regulations

Risks

Under NOHSC:1008(2004)

R15: Contact with water liberates flammable gases
R20: Harmful by inhalation,
R22: Harmful if swallowed,
R36: Irritating to the eyes,
R38: Irritating to the skin,
R48/23/25: Danger of serious damage to health by prolonged exposure /toxic by inhalation/toxic if swallowed

Under GHS Classification Criteria

H261: Contact with water liberates flammable gases
H332: Harmful by inhalation
H302: Harmful if swallowed
H319: Irritating to the eyes
H315: Causes skin irritation
H372: Causes damage to organs

Label Elements/Safety Phrases

S9: Keep in well ventilated place.
S22 Do not breathe dust.
S24: Avoid contact with skin,
S28 After contact with skin irrigate immediately with large amount of water. Dilute acetic acid (vinegar may be applied),
S36 Wear appropriate PPE,
S38 Wear appropriate PPE where ventilation is poor,
S41 Do not breathe fumes.

Rinse eyes with large amount of water.

2.3 Other Hazards Which Do Not Result In Classification

Not applicable.

3. COMPOSITION

Approximate composition as follows:

Substance	Identification (CAS No.)	Content
Carbon	7440-44-0	40-80%
Sodium Fluoride	7681-49-4	<20%
Cryolite	15096-52-3	<10%
Aluminium Oxide (Alumina)	1344-28-1	<7%
Calcium Fluoride	7789-75-5	<1%
Cyanide Compounds	-	<0.05%
Aluminium Phosphide	20859-73-8	<0.02%
α Quartz	14808-60-7	<0.5%

4. FIRST AID MEASURES

General: Remove person from exposure area immediately. Provide rest, warmth and fresh air and treat according to following:

Skin contact: Remove any contaminated clothing etc. Wash exposed area thoroughly with cold, soapy water. Seek medical attention if an irritation develops or persists

Eye contact: Irrigate with copious amounts of cold water. Seek medical attention if irritation persists.

Ingestion: Rinse mouth with water. Seek medical attention if irritation persists.

Inhalation: Move exposed person to fresh air. Avoid physical exertion. Seek medical attention.

5. FIRE FIGHTING MEASURES

Extinguishing Media.

Suitable Extinguishing Material: Sand, Dry Soil or similar material. Dry powder and C02 extinguisher

Unsuitable Extinguishing Material: Water

Specific Hazards Arising From The Substance Or Mixture.

The material is non-flammable, but may emit gases in contact with water. Gases may include hydrogen, methane, acetylene, ammonia.

Special Protective Equipment And Precautions For Firefighters

Use a heat-insulated suit of flame-retardant material and SCUBA.

6. ACCIDENTAL RELEASE MEASURES

Personnel Precautions, Protective Equipment and Emergency Procedures
Establish a 20m exclusion zone. Use PPE specified in Section 8 of this document.

Environmental Precautions
Arrange for removal of material from the environment to prevent uncontrolled release of toxins.
Prevent contact with water and discharge of leachate to waterways and groundwater.

Methods and Materials For Containment & Clean-up
In the event of a spill in an accident such as a truck rollover, contain the material, then remove the material using an excavator, the air conditioning of which is fitted with a HEPA filter. Door of cabin to be closed at all times, excavator driver to wear P2 respirator and remain in cabin while clean-up is underway. Spill site to be stripped of 5cm of soil under spill, stripped soil to be disposed of with spent potlining waste.
Clearance to be provided by independent, competent person once clean-up is completed.

References To Other Sections
See Sections 8 and 13 for PPE requirements and waste disposal.

7. HANDLING & STORAGE

Precautions For Safe Handling
A safe work method statement to be developed prior to the commencement of handling of the material. Handling procedures should avoid the generation of dust. Recommended PPE to be worn at all times – P2 respirator. Excavator air conditioning to be fitted with HEPA filter.

Conditions for Safe Storage, Including any Incompatibilities
Store in cool, dry, well-ventilated area. Avoid contact with any liquids including water, acids etc. Any leachate generated is to be contained. Ensure security is in place to prevent unauthorised access.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters - Exposure Standards, Biological Monitoring
Threshold Limit Values are the recognised exposure standards for chemical substances. There are three main categories of TLV:

TLV – TWA – Threshold Limit Value Time Weighted Average – the time weighted average concentration for a conventional 8 – hr work day and a 40 hr work week to which it is believed nearly all workers may be repeatedly exposed without adverse health effects.

TLV – STEL – Threshold Limit Value Short Term Exposure Limit – the concentration of an atmospheric contaminant to which it is believed that workers can be exposed for a short period of time without suffering from irritation, chronic or irreversible tissue damage or narcosis. STEL's are defined as a 15 minute TWA exposure which should not be exceeded at any time.

TLV – C – Threshold Limit Value Ceiling - the concentration which should not be exceeded during any part of the working exposure.

TLV's for substances which may be present in spent potlining are shown in the table below:

Chemical Substance	TLV-TWA (mg/m^3)
Aluminium Oxide (Alumina)	10
Phosphine	0.15
Inorganic Fluorides	2.5
Cyanide (as CN)	5
α Quartz	0.3*

* * No interim value (currently under review)

There is a biological exposure standard for Fluoride, but this relates to exposure to gaseous fluoride and is not relevant to spent potlining waste which contains only particulate fluoride.

Appropriate Engineering Controls

Store material in a dry, well ventilated area which is secured against unauthorised access.

When handling material, excavator to be enclosed and air-conditioned with HEPA filter on the air conditioner intake.

Personal Protective Equipment

All personnel at risk of exposure to wear PPE including respiratory protection with a minimum rating of P2.

Personal hygiene: Wash before eating, drinking or smoking. Shower at the end of the shift if required.

If directly in contact with the material, wear disposable suit Type 5, goggles, neoprene gloves and P2 respirator.

9. PHYSICAL & CHEMICAL PROPERTIES

Basic Relevant physical & chemical properties as follows:

Physical state:	Solid Lumps
Colour:	Grey/Black
Odour:	Generally odourless but slight ammonia smell if moist. (OSHA - odour threshold is between 5 and 40ppm)
Melting Point:	Does not melt but is combustible (not self-generating)
Solubility in water:	Slightly soluble
pH:	Leachate from the material has a high pH (is very alkaline) due to the presence of sodium compounds
Release of gases:	The material reacts with water to produce gases which may include hydrogen, acetylene and ammonia. These are generally in low concentrations and disperse before exposure guidelines are approached.

10. STABILITY & REACTIVITY

Reactivity

No hazardous reactions known if used for its intended purpose.

Chemical Stability

Stable if kept dry. Reacts with water if exposed.

Conditions To Avoid

Avoid contact with oxidising agents, water and acids.

Incompatible Materials & Possible Hazardous Reactions

Incompatible with acids (hydrogen fluoride, hydrogen cyanide, phosphine generated), oxidising agents (spontaneous combustion occurs) and water (methane, acetylene, hydrogen produced)

Hazardous Decomposition Products

These include hydrogen, hydrogen fluoride, hydrogen cyanide, phosphine.

11. TOXICOLOGICAL INFORMATION

Information On Routes Of Exposure

The toxicity of the material relates to its chemical composition and to the potential for generation of highly alkaline liquids.
Routes of exposure for spent potlining dust may include inhalation and ingestion. Highly alkaline liquids generated by the hygroscopic nature of the material may cause skin burns.

Symptoms Related To Exposure

Acute effects include irritation to the eyes, nose and throat, and headaches. Liquids generated by the material may cause skin irritation and "burns". Chronic effects are less likely because of the generally transient exposure of workers to these types of materials.

Exposure Levels

Surveys have established that in well controlled handling activities, worker total dust exposures are generally <2mg/m^3. In addition, respiratory protection (P2 respirator) is giving added protection.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Material produces highly alkaline liquors when wet. These are highly toxic to aquatic organisms.

Persistence & Degradability

The material would degrade naturally in the open environment. Material is hygroscopic, so water uptake occurs in a humid environment causing the material to turn to a powder over time.

Bioaccumulation Potential

Fluoride, a component of spent potlining may accumulate in calcium in bone and teeth, but fluorides in the potlining are only sparingly soluble. There is only a small potential for bioaccumulation.

Mobility In Soil.

No mobility occurs if the material is properly stored. Uncontrolled exposure of potlining material results in generation of highly alkaline liquors which are mobile in soil. Other components of the material are generally immobile.

13. DISPOSAL CONSIDERATIONS

Safe Handling & Disposal Methods

Enclosed excavator fitted with HEPA filter on the air conditioner intake is the preferred safe handling method. Excavator driver to also wear P2 respirator. Transport by covered truck to secure, dry storage area (shed).
Disposal of material is tightly regulated under environmental regulations, and disposal is only to approved sites/locations/facilities.

14. TRANSPORT INFORMATION

The material is classified as a dangerous good under the Australian Dangerous Good Code.

Transportation:	Land Transport	Sea Transport	Air Transport
UN Number:	3170	3170	3170
UN Proper Shipping Name:	Aluminium Smelting By-Products or Aluminium Remelting By-Products		
Transport Hazard Classes:			
DG Division:	4.3	4.3	4.3
Subsidiary Risks:	None Allocated	-	-
Packing Group:	III	III	III
Environmental Hazards:	None Allocated		
Special Precautions For User:			
Hazchem Code:	4W		
EMS		F-G, S-P	

15. REGULATORY INFORMATION

The material is highly regulated in NSW. Transport and disposal requires specific approval from the NSW EPA. Storage and disposal have been the subject of an environmental impact assessment. Transport and disposal off-site would require approval of NSW environmental authorities and would be subjected to stringent requirements.

SAFETY DATA SHEET SPENT POTLINING SECOND CUT

Business or Trading Name	Hydro Aluminium Kurri Kurri Pty Ltd	**Facility Name:**	Hydro Kurri Kurri Aluminium Smelter
Postal Address	P.O. Box 1. Kurri Kurri. NSW. 2327.	**Address:**	Kurri Kurri Smelter Hart Rd Loxford NSW 2327 Australia
ABN	55 093 266 221	**Description of Material**	Spent Potlining Material –Second Cut

1. IDENTIFICATION OF MATERIAL AND SUPPLIER

1.1 Product Identifier & Identity For The Chemical

Spent Potlining Second Cut

1.2 Other Means Of Identification

Spent Cell Insulation Lining/Refractories; Pot Lining Refractory Waste

1.3 Recommended Use Of The Material & Restrictions On Use

There are no recommended uses of the material which is a waste product of the aluminium production process.

1.4 Suppliers Name, Address & Telephone Number

Generator:
Hydro Aluminium Kurri Kurri'
P.O. Box 1,
Kurri Kurri. NSW. 2327.
Telephone: 0249371555
Email: richard.brown@hydro.com
Emergency Telephone Number 02 49371555

2. HAZARD IDENTIFIER

2.1 Classification Of The Hazardous Chemical

Classified as Hazardous: Safe Work Australia "Classification Of Hazardous Chemicals Under The WHS Regulations" (the WHS Regulations)

2.2 Label Elements Including Precautionary Statements Identified In The WHS Regulations

Risks

Under NOHSC:1008(2004)

R15: Contact with water liberates flammable gases
R20: Harmful by inhalation,
R22: Harmful if swallowed,
R36: Irritating to the eyes,
R38: Irritating to the skin,
R48/20: Danger of serious damage to health by prolonged exposure /toxic by inhalation

Under GHS Classification Criteria

H261: Contact with water liberates flammable gases
H332: Harmful by inhalation
H302: Harmful if swallowed
H319: Irritating to the eyes
H315: Causes skin irritation
H373: Causes damage to organs

Label Elements/Safety Phrases

S9: Keep in well ventilated place.
S22 Do not breathe dust.
S24: Avoid contact with skin,
S25: Avoid contact with eyes.
S36 Wear appropriate PPE,
S38 Wear appropriate PPE where ventilation is poor,
S41 Do not breathe fumes.

2.3 Other Hazards Which Do Not Result In Classification

Not applicable.

3. COMPOSITION

Approximate composition as follows:

Substance	Identification (CAS No.)	Content
Sodium Fluoride	7681-49-4	1-3%
Cryolite	15096-52-3	5-24%
Iron Oxide	1309-37-1	5-20%
Aluminium Oxide (Alumina)	1344-28-1	18-30%
Cyanide Compounds	-	<0.05%
Aluminium Phosphide	20859-73-8	<0.02%
Amorphous Silica	14808-60-7	35-40%
Crystalline Silica	1440-44-1	0-20%
Carbon	7440-44-0	0-5%
Sodium Hydroxide	1310-73-2	<1%

4. FIRST AID MEASURES

General: Remove person from exposure area immediately. Provide rest, warmth and fresh air and treat according to following:

Skin contact: Remove any contaminated clothing etc. Wash exposed area thoroughly with cold, soapy water. Seek medical attention if an irritation develops or persists

Eye contact: Irrigate with copious amounts of cold water. Seek medical attention if irritation persists.

Ingestion: Rinse mouth with water. Seek medical attention if irritation persists.

Inhalation: Move exposed person to fresh air. Avoid physical exertion. Seek medical attention.

5. FIRE FIGHTING MEASURES

Extinguishing Media.

Suitable Extinguishing Material: Sand, Dry Soil or similar material. Dry powder and C02 extinguisher

Unsuitable Extinguishing Material: Water

Specific Hazards Arising From The Substance Or Mixture.

The material is non-flammable, but may emit gases in contact with water. Gases may include hydrogen, methane, acetylene, ammonia.

Special Protective Equipment And Precautions For Firefighters

Use a heat-insulated suit of flame-retardant material and SCUBA.

6. ACCIDENTAL RELEASE MEASURES

Personnel Precautions, Protective Equipment and Emergency Procedures
Establish a 20m exclusion zone. Use PPE specified in Section 8 of this document.

Environmental Precautions
Arrange for removal of material from the environment to prevent uncontrolled release of toxins.
Prevent contact with water and discharge of leachate to waterways and groundwater.

Methods and Materials For Containment & Clean-up
In the event of a spill in an accident such as a truck rollover, contain the material, then remove the material using an excavator, the air conditioning of which is fitted with a HEPA filter. Door of cabin to be closed at all times, excavator driver to remain in cabin while clean-up is underway. Spill site to be stripped of 5cm of soil under spill, stripped soil to be disposed of with spent potlining waste.
Clearance to be provided by independent, competent person once clean-up is finished.

References To Other Sections
See Sections 8 and 13 for PPE requirements and waste disposal.

7. HANDLING & STORAGE

Precautions For Safe Handling
A safe work method statement to be developed prior to the commencement of handling of the material. Handling procedures should avoid the generation of dust. Recommended PPE to be worn at all times – P2 respirator. Excavator air conditioning to be fitted with HEPA filter.

Conditions for Safe Storage, Including any Incompatibilities
Store in cool, dry, well-ventilated area. Avoid contact with any liquids including water, acids etc. Any leachate generated is to be contained. Ensure security is in place to prevent unauthorised access.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters - Exposure Standards, Biological Monitoring
Threshold Limit Values are the recognised exposure standards for chemical substances. There are three main categories of TLV:

TLV – TWA – Threshold Limit Value Time Weighted Average – the time weighted average concentration for a conventional 8 – hr work day and a 40 hr work week to which it is believed nearly all workers may be repeatedly exposed without adverse health effects.

TLV – STEL – Threshold Limit Value Short Term Exposure Limit – the concentration of an atmospheric contaminant to which it is believed that workers can be exposed for a short period of time without suffering from irritation, chronic or irreversible tissue damage or narcosis. STEL's are defined as a 15 minute TWA exposure which should not be exceeded at any time.

TLV – C – Threshold Limit Value Ceiling - the concentration which should not be exceeded during any part of the working exposure.

TLV's for substances which may be present in spent potlining are shown in the table below:

Chemical Substance	TLV-TWA (mg/m^3)
Aluminium Oxide (Alumina)	10
Iron Oxide	10
Phosphine	0.15
Inorganic Fluorides	2.5
Cyanide (as CN)	5
α Quartz	0.3 (Under Review)

There is a biological exposure standard for Fluoride, but this relates to exposure to gaseous fluoride and is not relevant to spent potlining waste which contains only particulate fluoride.

Appropriate Engineering Controls
Store material in a dry, well ventilated area which is secured against unauthorised access.
When handling material, excavator to be enclosed and air-conditioned with HEPA filter on the air conditioner intake.

Personal Protective Equipment
Air conditioning systems of mobile equipment to be fitted with HEPA filters.
Emergency shower and eye wash to be available. Wash before eating, drinking or smoking. Shower at the end of the shift.
If directly in contact with the material, wear disposable suit Type 5, goggles, neoprene gloves and P2 respirator.

9 PHYSICAL & CHEMICAL PROPERTIES

Basic Relevant physical & chemical properties as follows:

Physical state:	Bricks and Solid Lumps
Colour:	Pink/Orange/White
Odour:	Generally odourless but slight ammonia smell if moist. (OSHA - odour threshold is between 5 and 40ppm)
Melting Point:	Does not melt but is combustible (not self-generating)
Solubility in water:	Slightly soluble
pH:	Leachate from the material may have a high pH (is very alkaline) due to the presence of sodium compounds
Release of gases:	The material reacts with water to produce gases which may include hydrogen, acetylene and ammonia. These are generally in low concentrations and disperse before exposure guidelines are approached.

10 STABILITY & REACTIVITY

Reactivity
No hazardous reactions known if used for its intended purpose. Mixing with water may liberate flammable gases.

Chemical Stability
Stable if kept dry. Reacts with water if exposed.

Conditions To Avoid
Avoid contact with oxidising agents, water and acids.

Incompatible Materials & Possible Hazardous Reactions
Incompatible with acids (hydrogen fluoride, hydrogen cyanide, phosphine generated), oxidising agents (spontaneous combustion occurs) and water (methane, acetylene, hydrogen produced)

.

Hazardous Decomposition Products
These include hydrogen, hydrogen fluoride, hydrogen cyanide, phosphine.

11 TOXICOLOGICAL INFORMATION

Information On Routes Of Exposure

The toxicity of the material relates to its chemical composition and to the potential for generation of highly alkaline liquids.
Routes of exposure for spent potlining dust may include inhalation and ingestion. Highly alkaline liquids generated by the hygroscopic nature of the material may cause skin burns.

Symptoms Related To Exposure

Acute effects include irritation to the eyes, nose and throat, and headaches. Liquids generated by the material may cause skin irritation and "burns". Chronic effects are less likely because of the generally transient exposure of workers to these types of materials.

Exposure Levels

Surveys have established that in well controlled handling activities, worker total dust exposures are generally <2mg/m^3. In addition, respiratory protection (P2 respirator) is work giving added protection.

12 ECOLOGICAL INFORMATION

Ecotoxicity

Material may produce highly alkaline liquors when wet. These are highly toxic to aquatic organisms.

Persistence & Degradability

The material would degrade naturally in the open environment. Material is hygroscopic, so water uptake occurs in a humid environment causing the material to turn to a powder over time.

Bioaccumulation Potential

Fluoride, a component of spent potlining may accumulate in calcium in bone and teeth, but fluorides in the second cut are only sparingly soluble. There is only a small potential for bioaccumulation.

Mobility In Soil.

No mobility occurs if the material is properly stored. Uncontrolled exposure of potlining material results in generation of highly alkaline liquors which are mobile in soil. Other components of the material are generally immobile.

13 DISPOSAL CONSIDERATIONS

Safe Handling & Disposal Methods

Enclosed excavator fitted with HEPA filter on the air conditioner intake is the preferred safe handling method. Transport by covered truck to secure, dry storage area (shed).
Disposal of material is tightly regulated under environmental regulations, and disposal is only to approved sites/locations/facilities.

14 TRANSPORT INFORMATION

The material is classified as a dangerous good under the Australian Dangerous Good Code.

Transportation:	Land Transport	Sea Transport	Air Transport
UN Number:	3170	3170	3170
UN Proper Shipping Name:	Aluminium Smelting By-Products or Aluminium Remelting By-Products		
Transport Hazard Classes:			
DG Division:	4.3	4.3	4.3
Subsidiary Risks:	None Allocated	-	-
Packing Group:	III	III	III
Environmental Hazards:	None Allocated		
Special Precautions For User:			
Hazchem Code:	4W		
EMS		F-G, S-P	

15 REGULATORY INFORMATION

The material is highly regulated in NSW. Transport and disposal requires specific approval from the NSW EPA. Storage and disposal have been the subject of an environmental impact assessment. Transport and disposal off-site would require approval of NSW environmental authorities and would be subjected to stringent requirements.

APPENDIX C - EMERGENCY EVACUATION EXERCISE OBSERVER'S CHECK LIST'

EMERGENCY EVALUATION

This form is to be used to assess the effectiveness of the Hydro Aluminium Emergency Procedure. This form should be used to assess both planned and unplanned emergency evacuations.

Workplace: Hydro Aluminium	**Date:**	**Evacuation Start Time:**
Person completing form: James Brown		**Evacuation Finish Time:**
Responsibility in Evacuation process:		**Number of Participants:**
Type of Emergency: ☑ **DRILL** ☐ General ☐ Environmental ☐ **ACTUAL EVACUATION**		**Scenario/Reason:**

EVALUATION CRITERIA	YES	NO	COMMENTS
1. Was there a complete evacuation of the site?			
2. Was the process effective in notifying all persons on site?			
3. Where all areas of the building / site checked?			
4. Did all persons respond to the Evacuation?			
5. Was anyone unsure of what to do? *(inc. wardens and occupants)*			
If so, was anyone not inducted/trained?			
6. Did any person refuse to end a phone call or act on instruction to evacuate?			
7. Did all workers assemble at the Emergency Assembly Area? *(Was it known?)*			
8. How long did it take for workers to assembly at the Emergency Assembly Area?			
9. Were the Emergency Assembly Areas appropriate? Location OK? Should there be more than one?			

EMERGENCY EVALUATION

10. Were all occupants accounted for (E.g. against a visitor's register?)			
11. Was the Emergency Controller aware of their role and responsibility?			
12. Was all Emergency Support Equipment gathered and used *(Emergency First Aid Kits, UHF radios, onsite register, mobile phones)?*			
13. Was any Safety or Environmental equipment, other than what was available, required?			
14. Did the Emergency Procedure fail to address this type of emergency at all or sufficiently?			
15. Were participants aware of the emergency protocols and did they implement them effectively?			
16. Were the communication protocols adhered to?			
17. Was there any collateral damage to people/property because of the drill?			
18. Were there any other internal factors that prevented the proper execution of the response plan? *e.g. disregard of drill, competence of persons*			
19. Were there any other external factors that prevented the proper execution of the response plan? *e.g. weather, delivery of materials*			

Other comments, issues or Opportunities for Improvement:

EMERGENCY EVALUATION

Corrective Actions Required:	Action Taken:	By:	Date Completed:

Action Controller (e.g., Supervisor)_____ Signature:_____ Date:_____
By signing you agree to ensure that the hazards will be appropriately controlled in the agreed timeframe.

Workplace Manager _____ Signature:_____ Date:_____
By signing you agree to ensure that the controls have been implemented and are effective.