Tomago Spent Potlining Treatment Facility

State Significant Development Modification Assessment (SSD 6050 MOD 2)

August 2019

Cover photo

Tomago Spent Potlining Thermal Treatment Plant

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Glossary

Abbreviation	Definition
AHD	Australian Height Datum
ADGC	Australian Dangerous Goods Code
CCO	Chemical Control Order
Consent	Development Consent
Council	Port Stephens Council
Dangerous Goods	As defined in the *Australian Dangerous Goods Act 1985* and classified in the Australian Code for Transport of Dangerous Goods by Road and Rail (ADG 7.4 Code)
Department	Department of Planning Industry and Environment
EHC licence	Environmentally Hazardous Chemical Licence
EHC Regulation	*Environmentally Hazardous Chemicals Regulation, 2017*
EA	Environmental Assessment
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
FRNSW	Fire and Rescue NSW
Hazardous Waste	Has the same meaning as the definition of the term in the Dictionary of the POEO Act
LEP	Local Environmental Plan
Minister	Minister for Planning and Public Spaces
OEH	Office of Environment and Heritage
RMS	Roads and Maritime Services
Proponent	Regain Services Pty Ltd
POEO Act	*Protection of the Environment Operations Act, 1997*
RtS	Response to Submissions
SEARs	Secretary's Environmental Assessment Requirements
Secretary	Secretary of the Department of Planning and Environment
SPL	Spent Potling
SEPP	State Environmental Planning Policy
SRD SEPP	*State Environmental Planning Policy (State and Regional Development) 2011*
SSD	State Significant Development
TAC	Tomago Aluminum Company

TTP	Thermal Treatment Plant
Waste	Has the same meaning as the definition of the term in the Dictionary POEO Act

Contents

1. Introduction

This report assesses a modification request by Regain Services Pty Ltd (the Proponent). The request seeks to increase the processing capacity of the existing spent potlining (SPL) treatment facility at the Tomago Aluminium Smelter (the smelter) from 20,000 tonnes per year (tpy) up to 60,000 tpy of SPL. The request includes the installation of an additional thermal treatment plant (TTP) to treat the SPL and changes to the site layout at 638 Tomago Road, Tomago (the site). The request has been lodged pursuant to section 75W of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The project was originally approved under Part 4 of the EP&A Act. The project is a transitional Part 3A project under Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017 (EP&A (STOP) Regulation). The power to modify transitional Part 3A projects under the former section 75W of the Act as in force immediately before its repeal on 1 October 2011 is being wound up – but as the request for this modification was made before the 'cut-off date' of 1 March 2018, the provisions of Schedule 2 (clause 3) continue to apply. Consequently, this report has been prepared in accordance with the requirements of Part 3A and associated regulations, and the Minister (or his delegate) may approve or disapprove the modification of the project under the former section 75W of the EP&A Act.

1.1 Background

The Proponent operates a SPL treatment facility at 638 Tomago Road, Tomago (the site) approximately 13 kilometres (km) northwest of the Newcastle Central Business District (CBD), in the Port Stephens local government area (see **Figure 1**). The site is located within the smelter and is leased to the Proponent by Tomago Aluminium Company (TAC). The development has operated since 2002. The Proponent is an Australian mineral trading and processing company and has been operating the SPL treatment facility at the smelter since 2002.

Figure 1 | Site Context

The site has approval to receive and process up to 20,000 tpy of SPL waste. SPL is generated from aluminium smelting, a process that extracts aluminium metal from aluminium oxide using electrolytic cells that are known as pots. During the smelting process, aluminium and fluorides are absorbed into the pot lining and after several years the pot lining fails, where the lining is removed from the pots. The removed lining is called SPL.

SPL is classified as a Class 4.3 (PG III) dangerous good (DG) (dangerous when wet) under the *Dangerous Goods Act 1985* (DG Act) and the Australian Code for Transport of Dangerous Goods by Road and Rail (ADG 7.4 Code). SPL is also classified as a hazardous waste under the *Protection of the Environment Operations Act 1997* (POEO Act) due to:

- its toxicity (fluoride and cyanide compounds are leachable in water),
- corrosiveness (high pH due to alkali metals and oxides)
- reactiveness with water (which can produce inflammable toxic and explosive gases such as hydrogen, methane and ammonia).

SPL is not permitted to be landfilled in NSW, however it can be treated to remove (immobilise) contaminants.

The site receives the SPL from both the smelter and the Hydro Aluminium smelter located at Kurri Kurri (the Kurri Kurri Smelter) where the SPL is treated (heated up to 850°C) via thermal treatment plant (TTP) to destroy its hazardous properties. The treated SPL product is either transported off-site as a coarse grade product or blended with carbon and sand depending on customer specifications. The treated SPL waste is then shipped overseas for use in cement and brick manufacturing in the Philippines, Sri Lanka and Thailand. **Figure 2** provides a flow diagram of the current operations at the site.

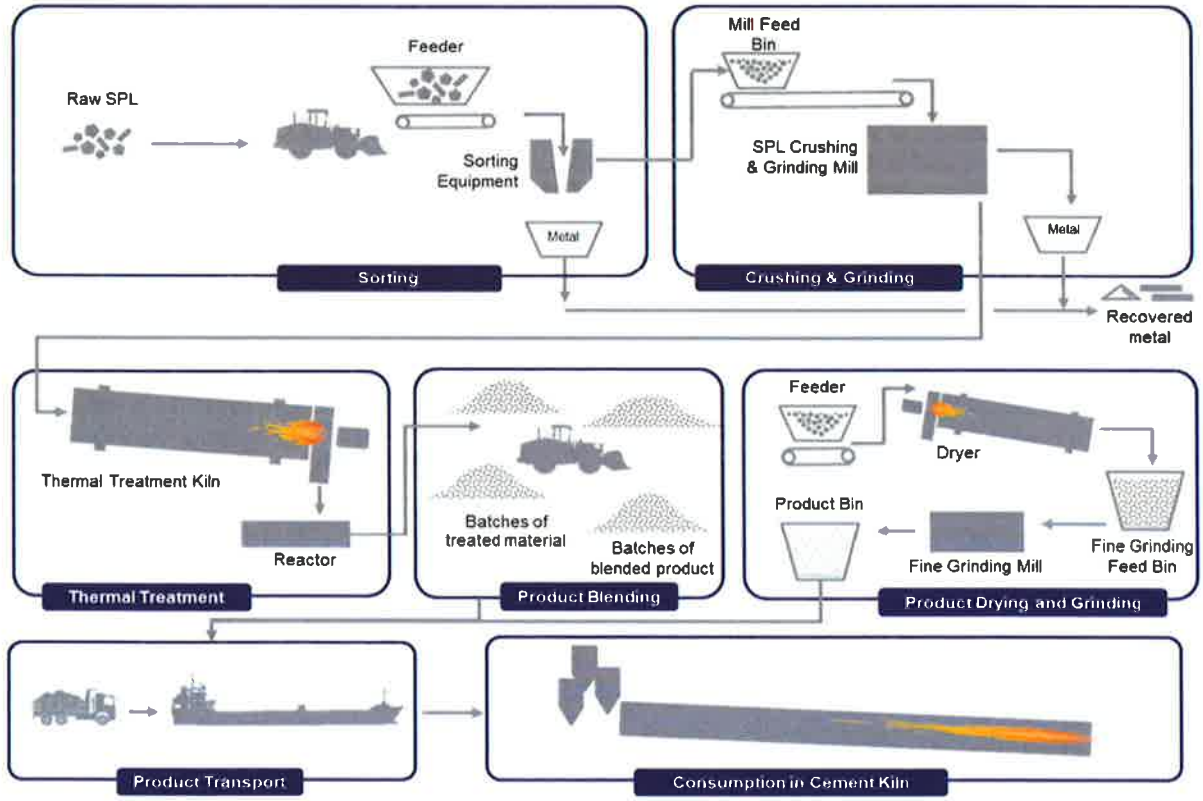

Figure 2 | SPL Treatment Process Stages and Equipment

The site is zoned IN1 General Industrial under the Port Stephens Local Environmental Plan 2013 (Port Stephens LEP) and is primarily surrounded by industrial land uses also zoned IN1 General Industrial. The site is legally referred to as Lot 3 in DP 808004.

The site is bordered by Tomago Road to the south and Old Punt Road and the Pacific Highway to the northwest. To the north of the site is the Tomago Sandbeds, an underground water aquifer that supplies water to Newcastle and the lower Hunter region. While the northern portion of the smelter is situated within this catchment, the SPL treatment facility is not. The Hunter Wetlands National Park and the Hunter River are located approximately 1 km to the south (see **Figure 1**). The site is within an approved buffer zone established by the TAC as part of the 1981 approval and 1991 expansion of the smelter. The buffer area was identified as land likely to be affected by sulphur dioxide and fluoride emissions from the smelter (see **Figure 1**).

The nearest sensitive receivers, the Tomago Bowling and Sporting Club and the Tomago Periodic Detention Centre, are each located 600 m to the south and the Tomago Village Van Park is located 1.6 km to the west. The closest residential receiver is located approximately 1.4 km to the west (see **Figure 1**).

Access to and egress from the site is via two driveways. Light vehicles access the site via the smelter's main entrance off Tomago Road, whereas heavy vehicles access the site via Old Punt Road off the Pacific Highway. A private road links the smelter with Old Punt Road (see **Figure 2**). Deliveries of SPL waste from the smelter do not involve truck movements on the public road network. Most site traffic travels to and from the site via the Pacific Highway which provides connectivity to the Port of Newcastle or the M1 (Pacific Highway)

Figure 3 | Site Location

1.2 The Treatment Process

At the smelter, the pots are transferred to the smelter's existing deline facility where the SPL is removed from the pots and then transferred via a conveyor and stored in Shed 5. The SPL from the Kurri Kurri smelter is delivered to the site by road) and unloaded in Shed 5. The current external site layout is illustrated in **Figure 4**. In Shed 5, the SPL is then broken up and sized by a front-end loader and excavator and then fed into the SPL crushing system and then moved into stockpiles in awaiting processing and treatment (see **Figure 5** and **Figure 6**). The Proponent estimates up to 8,000 tonnes of SPL waste can be stored in Shed 5 at any one time.

Figure 4 | Existing Site External Layout

Figure 5 | SPL stored in Shed 5

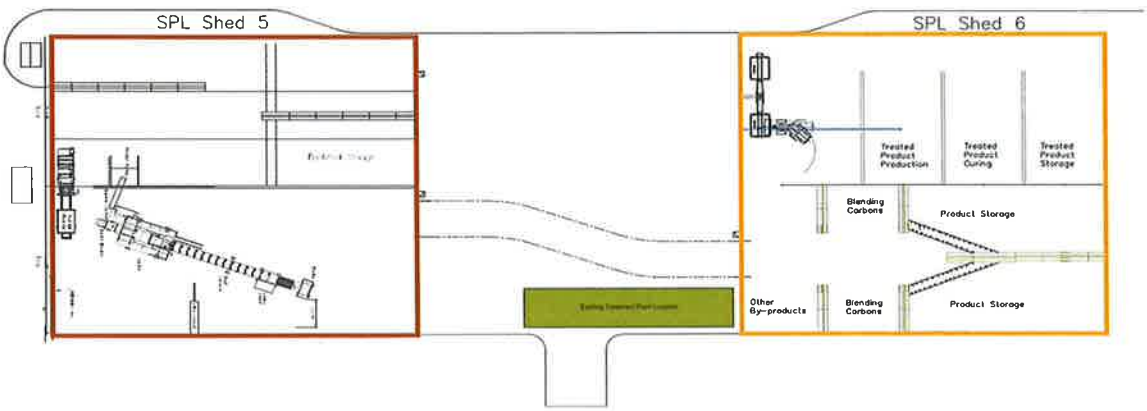

Figure 6 | Current Approved Layout

SPL is conveyed through an enclosed conveyor to the rotary kiln where the SPL is heated up to 850°C. The high temperature removes the hazardous gases and heavy metals (such as cyanided and flammable gases) and the end product is no longer considered a hazardous waste. The TTP is located on the southern side of the site between Shed 5 and Shed 6. The TTP layout is illustrated in **Figure 7**.

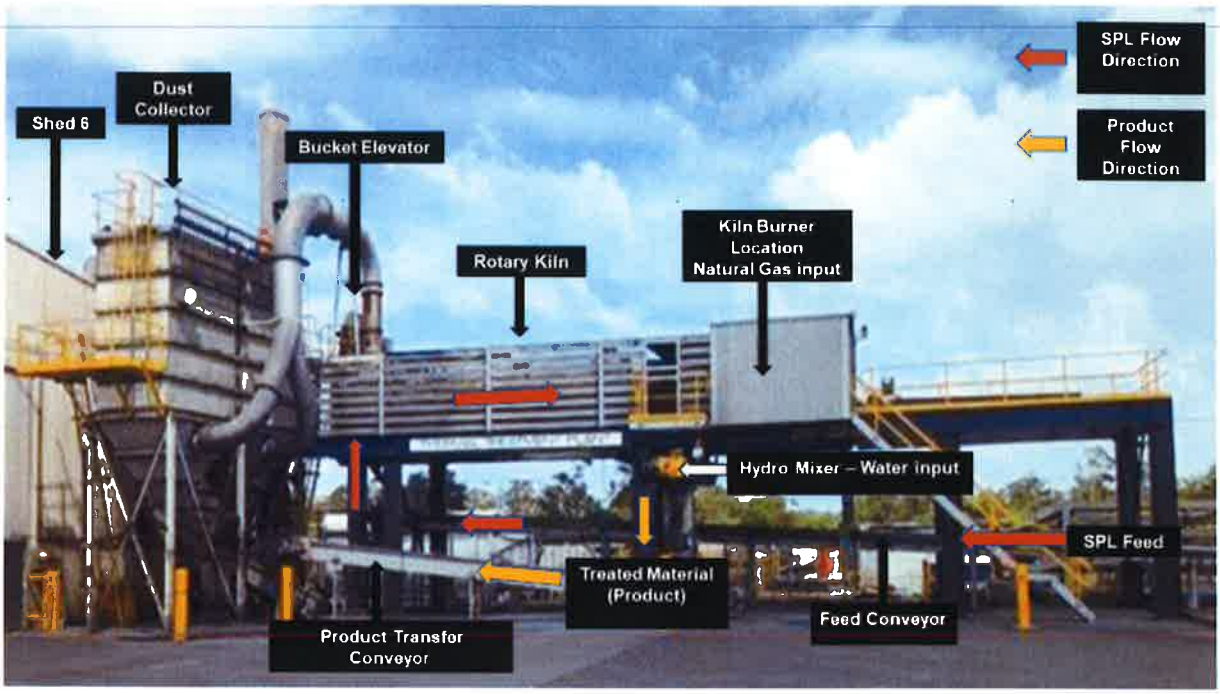

Figure 7 | The Existing 20,000 tpy TTP

The treated SPL is carried by an enclosed conveyor to Shed 6 (see **Figure 6**). In Shed 6, the treated SPL product is either left and stored as a coarse grade product or blended with carbon and sand depending on customer specifications (see **Figure 8**). The smelter generates up to 1000 tonnes of waste carbon per year and the Proponent blends between 100 to 500 tonnes of the carbon through the treated SPL.

The Proponent currently manufactures four products known as "HiCAI" (HiCal product) in the SPL treatment process. The products are used as fluxes (a substance that lowers the temperature at which solid materials enter a liquid phase) and mineralisers (a substance that accelerates reactions rates) in cement manufacturing. The final SPL products contain high levels of fluoride, sodium, carbon and alumina. The fluoride accelerates the cement formation, sodium adds strength to the cement, carbon provides heat energy and alumina reduces the need to use other alumina materials in the cement production process. Once blended, the HiCAI product is transported by heavy vehicles as containerised freight and/or dry bulk shipments to the Port of Newcastle and shipped overseas for use in cement and brick manufacturing.

In NSW, SPL is regulated under a Chemical Control Order (CCO) issued under the *Environmentally Hazardous Chemicals Act, 1985* (EHC Act). The CCO is currently the only regulatory tool that allows SPL to be converted into a product and the treated SPL is not classified as a waste under the POEO Act. In 2008, the Proponent was advised by the Federal Department of Environment and Energy (DEE), that HiCAI products are not considered hazardous waste and therefore the Proponent is not required to obtain a permit from DEE under the *Hazardous Waste Act, 1989* to export the HiCAI product overseas.

Figure 8 | Treated SPL in Shed 6

1.3 Approval History

The construction and operation of the smelter was approved under two separate development consents. TAC was granted development consent (DA 391/80) by the then Minister for Planning and Environment on 6 March 1981 for the construction and operation of the smelter (incorporating two potlines). A subsequent development consent (DA 4980/90) was granted by the then Minister for Planning on 11 January 1991 for the construction and operation of a third potline at the smelter. Condition 8 of DA/4908/90 requires the Proponent to convert the SPL to a non-hazardous waste.

In 2002, the Proponent was commissioned by TAC to develop a trial system to treat the SPL and convert it to a usable product and develop markets for the waste product. The trial plant was constructed to demonstrate the Proponent's process to produce marketable waste product from the SPL. The trial commenced in 2002 and processed up to 12,000 tpy of SPL from the smelter.

Following the successful trial, on 7 August 2009 the then Minister for Planning granted project approval to MP 06_0050 for the construction and operation of a larger SPL treatment facility to convert up to 20,000 tpy of SPL into reusable products. The approval permitted the facility to process SPL from both the smelter and the Kurri Kurri smelter. The approval also permitted the following:

- the use of the existing SPL sheds 5 and 6
- the installation of a new 20,000 tpy capacity TTP to replace the trial plant
- installation of a drying plant
- installation of an integrated grinding and blending plant

On 16 November 2016, the Director Industry Assessments, as delegate of the Minister for Planning granted approval to the modification of MP 06_0050 MOD 1 to amend Condition 5 of the approval. The modification permitted the Proponent to obtain SPL from other smelters in the region and/or interstate.

The Proponent holds an environment protection licence (EPL) (Number (No.) 13269) issued under the POEO Act to operate the SPL facility and an EHC Act Licence (No. 88) which imposes conditions on the processing and conveying of the SPL.

During discussions with the Proponent in May 2018, the Proponent advised the Department that:

- the approved TTP had not been installed and instead the trial plant had been upgraded with a new burner management system
- the location of the upgraded trial TTP differs to the configuration approved in the site plans in MP 06_0050
- the integrated grinding and blending plant had not been installed
- an automated stormwater system had been installed which differed to the stormwater system described in the EA in the original application and is seeking retrospective approval for the partial upgrade.

2. Proposed Modification

2.1 Proposed Modification

The Proponent has lodged a modification request under the former section 75W of the EP&A Act to modify the SPL Treatment Facility. The modification is described in full in the Environmental Assessment (EA) included in **Appendix B**, illustrated in **Figure 9** to **Figure 11** and summarised in **Table 1** below.

The Proponent seeks the following modifications to the approved project:

- increasing the throughput of SPL treated at the site from 20,000 tonnes per year (tpy) up to 60,000 tpy
- installation and operation of an additional TTP with the capacity to treat up to 40,000 tpy of SPL
- installation of drying plant, fine grinding plant and product bin for product preparation
- stormwater system upgrade
- installation of additional pollution control equipment including air filter for Shed 5
- amendment to the approved site plans to reflect existing and proposed layout of the site.

Table 1 | Summary of Proposed Modifications

Aspect	Approved	Proposed
Increase in throughput	• treatment of up to 20,000 to of SPL	• treatment of up to 60,000 tpy of SPL with a maximum: – daily throughput of up to 216 tonnes per day of SPL – weekly throughput of up to 1,500 tonnes per week of SPL
Construction	• N/A	• two proposed construction stages: – Stage 1 - construction, commissioning and integration of the additional TTP, installation of stormwater controls and conveyors – Stage 2 – construction and installation of bulk product plant handling elements including the drying plant, fine grinding feed bin, fine grinding plant and bulk product bin
Waste SPL Storage and Feed Preparation in Shed 5	• preparation of feedstock and conveyance to rotary kiln with industrial grinding equipment • an air filter shared between the Deline facility and Shed 5	• improved grinding equipment and processes with reduced operator interaction • a dedicated dust collection point would be employed for Shed 5 (SPL preparation areas
TTP	• installation and operation of a TTP with capacity to treat up to 20,000 tpy of SPL waste which: – would comprise of a rotary kiln and water reaction mixer – one emission point and dust filter units to filter emissions	• installation and operation of a new TTP with capacity to treat up 40,000 tpy of SPL waste which would comprise of: – a rotary kiln and water reaction mixer – an independent emission point and dust filter units to filter emissions

Aspect	Approved	Proposed
	– constructed to an approximate total height of 30 m	– constructed to an approximate total height of 15 m • continued operation of the 20,000 tpy of SPL waste TTP
Blending, Drying and Grinding Equipment	• integrated grinding and blending plant including blending, drying, grinding, grinding feed bin and four large product bins	• separate plants for product preparation, single product with no blending – blending plant removed · – separate drying plant – separate fine grinding plant with feed bin – single product bin • reduction in the amount of dust generated due to blending, and lower throughput of material
Stormwater	• single stormwater catchment system	• two additional catchment systems
Heavy Vehicle Movements	• 30 heavy vehicle movements per week to and from the site	• 120 heavy vehicle movements per week to and from the site
Capital Investment	• $15 million	• Additional $15 million

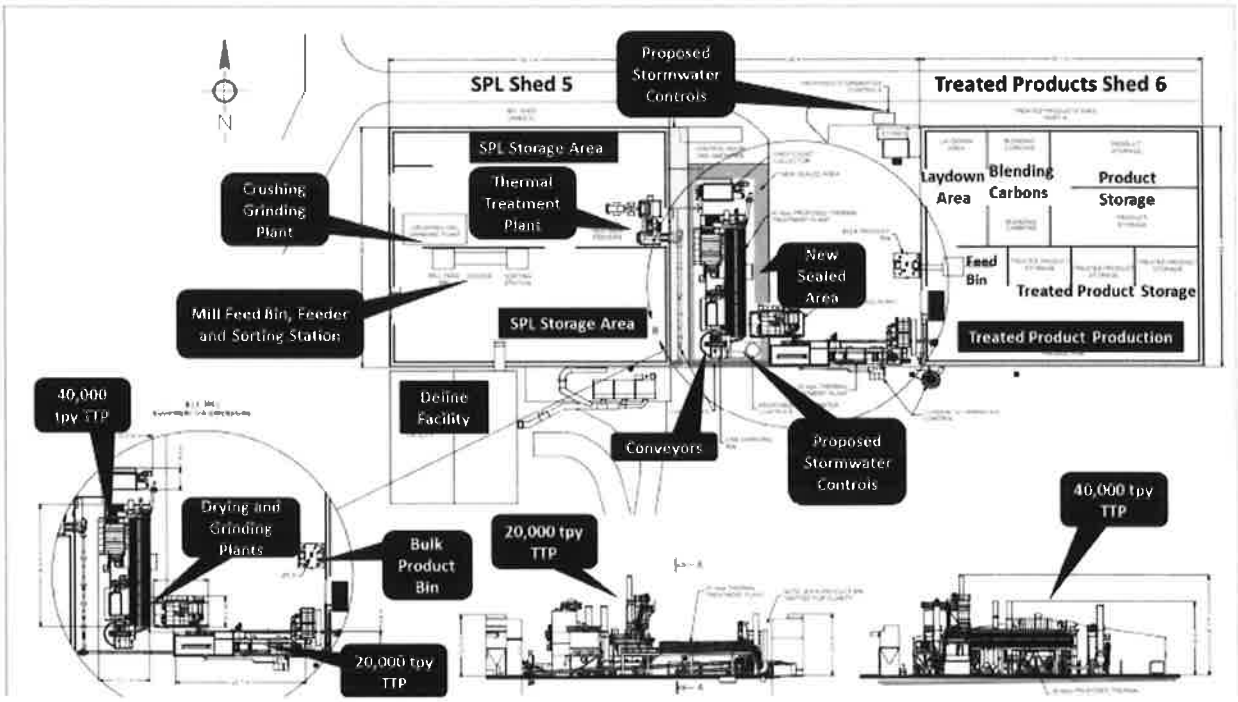

Figure 9 | Conceptual Site Layout

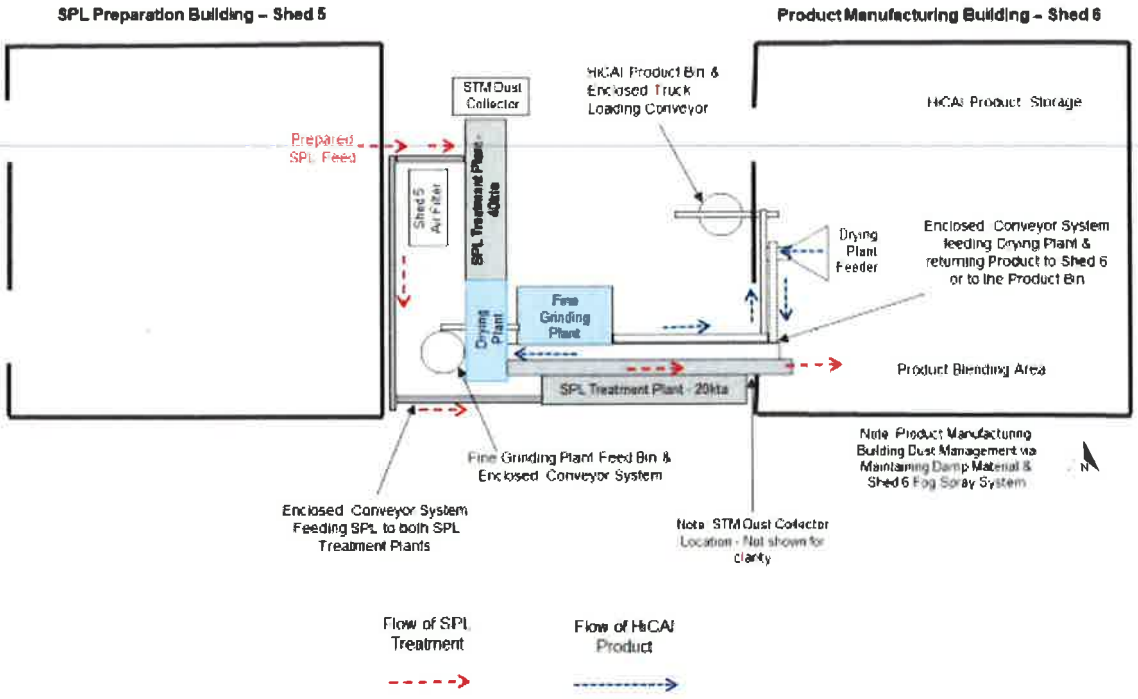

Figure 10 | Conceptual SPL Treatment Flow Diagram

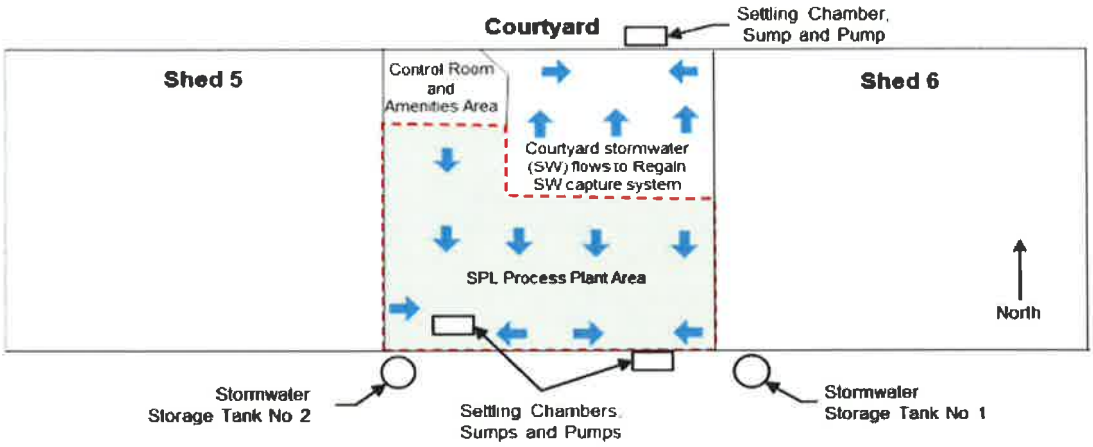

Figure 11 | Conceptual Stormwater Layout

2.2 The Proposed SPL Treatment Process

The modification request proposes the following amendments to the SPL treatment process.

Waste SPL Preparation

The Proponent has identified SPL treatment would continue as described in **Section 1.1** of this report, however the modification proposes a dedicated dust extraction system (no longer shared with the smelter's deline facility) for Shed 5 to prevent fugitive dust emissions. Shed 5 would remain under slight negative pressure with all unloading occurring within the building with the roller shutters closed.

Thermal Treatment of Waste SPL

The modification request proposes to feed the prepared SPL from Shed 5 through an enclosed continuous feeder and conveyed to either the existing 20,000 tpy or the new 40,000 tpy rotary kiln. **Figure 10** illustrates the SPL

primary fuel in the brick and cement industries. The proposed increase in capacity of the SPL facility would assist in reducing SPL wastes stockpiled throughout Australia.

The Proponent also stated it cannot operate at its optimal capacity with the existing production limit of 20,000 tpy. An increased production limit is required at the SPL facility to reduce the frequency of plant shut-down and start-up processes, reduced energy requirements and operational costs.

treatment flow. The feeder speed would be electronically recorded. The feed rate would be calibrated based on the weight of the treated SPL batches. The electronic system would enable the Proponent to ensure that no more than 20,000 tonnes per year of SPL waste is put through the smaller capacity TTP.

The prepared SPL would be treated by high temperature thermal oxidation in either the 20,000 tpy or 40,000 tpy TTP. Heated SPL would then be transferred to the water reaction mixer, which produces flammable gases (such as ammonia, hydrogen, methane and acetylene). These gases would be re-circulated into the kiln as fuel and thermally destroyed.

The processing of SPL through the TTP would take approximately 30 minutes. The treated SPL is stored Shed 6 where batches of processed SPL are tested to ensure cyanide levels are below 60 parts per million (ppm). If a batch of treated SPL has cyanide levels that exceeds specification, then the batch would be rejected and reprocessed through the TTP. Batch sizes do not exceed 500 tonnes. Laboratory testing and analysis is performed by independent laboratories. The thermal treatment process is complete after a final curing process which typically lasts for one or two weeks, dependant on the treated SPL's characteristics and final product specification.

SPL Product Preparation

The modification request proposes the treated SPL product would either undergo further processing on-site or be transported off-site as a coarse grade product depending on customer requirements. Treated SPL product would continue to be stored in Shed 6 (see **Figure 8**).

Where the SPL product requires further processing, it would be conveyed to the proposed rotary dryer via enclosed conveyors. The dried product would then be transferred to the proposed product feed bin using a bucket elevator, and then to the fine grinding plant where it would be milled. Following milling, the SPL product would be passed to the product bin within Shed 6 via an enclosed conveyor.

The proposed fine grinding plant would be maintained under a negative pressure through a ventilation extraction system(see **Figure 9**). The fine grinding feed bin would be used for the interim storage and transfer of approximately 140 tonnes of treated SPL product for fine grinding. The bulk product bin would be used for the interim storage of products prior to shipment. The bin would be able to hold 200 tonnes of SPL product and would allow for loading of trucks by enclosed conveyor. The installation of the bulk product plant handling equipment won't occur until Stage 2.

Stormwater Upgrade

The modification proposes to upgrade the stormwater management system at the site by installing an additional stormwater tank, a first flush capture system, stormwater collection points, rainwater tanks, pumps and piping to allow for the capture of stormwater and reuse in the treatment of SPL (see **Figure 11**).

2.3 Proponent's Justification for the Proposed Modification

The Proponent stated SPL waste from aluminium smelters has been historically stockpiled at smelters and/or exported overseas for treatment. The Proponent identified long term stockpiling of the hazardous waste is not considered appropriate where it poses ongoing potential risks. A report prepared by Randell Environmental Consulting on behalf of the DEE titled Spent Potlining Project (Feasibility of an Agreement Based Approach to Clear Stockpiles), 2016 identified SPL stockpiles had accumulated in Australia with a total of approximately 700,000 tonnes of SPL. The report estimated that aluminium smelters in Australia currently generate approximately 36,000 tonnes of SPL per annum.

The Proponent noted not only does the existing SPL treatment facility fully recycles the waste by removing it from the waste stream, it additionally generates a product that provides energy savings and reduces the consumption of

3. Strategic Context

The Department has considered the following strategic documentation relevant to the assessment of the proposed modification application:

- Waste Avoidance and Resource Recovery Strategy
- The Hunter Regional Plan 2036

3.1 Waste Avoidance and Resource Recovery Strategy

Reducing waste and keeping materials circulating within the economy are priorities for the NSW Government as set out in NSW 2021. To meet this important challenge, the Government prepares a new state-wide Waste Avoidance and Resource Recovery (WARR) Strategy every five years.

The WARR Strategy for 2014-2021 sets a waste recovery target for commercial and industrial waste of 70 %, up from a recovery performance of 52 % in 2010-11, and for construction and demolition waste of 80 %, up from recovery performance of 75 % in 2010-2011.

The modification request is consistent with the directions and objectives outlined in the WARR Strategy by managing problem wastes better.

3.2 The Hunter Regional Plan 2036

The Hunter Regional Plan 2036 (the Plan) sets out the NSW Government's vision for Newcastle, Lake Macquarie, Port Stephens, Maitland Cessnock LGA's until 2036.

Key priorities of the plan are to strengthen the region's economy, increase resilience to hazards and climate change, provide greater housing choices and employment and promote a biodiversity, rich natural environment. The modification request is consistent with the directions and objectives outlined in the Plan and supports the strategic direction No. 24 of the Plan to protect industry clusters such as Tomago Industrial area close to the Hunter's interregional transport networks and strategic direction No. 26 which enables the delivery of services including waste disposal areas. It would allow for SPL waste generated from aluminium smelters in the Hunter region to be treated and then reused beneficially.

4. Statutory Context

4.1 Scope of Modifications

Under Schedule 2 of the EP&A (STOP) Regulation, the power to modify transitional Part 3A projects under former section 75W of the EP&A Act as in force immediately before its repeal on 1 October 2011 is being wound up – but as the request for this modification was made before the 'cut-off date' of 1 March 2018, the provisions of Schedule 2 (clause 3) continue to apply.

The Department notes that:

- the primary function and purpose of the approved project would not change as a result of the proposed modification
- the modification would not involve any works outside the already approved development area
- the modification is of a scale that warrants the use of former section 75W of the EP&A Act. While the modification would involve an additional thermal treatment plant, the changes are substantially the same as the existing operation at the facility
- the modification does not propose an increase in the amount of SPL waste stored, which as a result does not increase the risk exposures to the surrounding land uses
- the modification would not significantly increase the environmental impacts of the project as approved and any potential environmental impacts would be appropriately managed through the existing or modified conditions of approval.

Therefore, the Department is satisfied the modification request is within the scope of former section 75W of the EP&A Act and does not constitute a new development application. Accordingly, the Department considers that the request should be assessed and determined under former section 75W of the EP&A Act rather than requiring a new development application to be lodged.

4.2 Consent Authority

The Minister for Planning is the approval authority for the request. However, under the Minister's delegation dated 11 October 2017, the Director, Industry Assessments, may determine the request under delegation as:

- the relevant local council has not made an objection
- a political disclosure statement has not been made
- there are no public submissions in the nature of objections.

5. Engagement

5.1 Department's Engagement

Under former section 75W of the EP&A Act, the Department is not required to notify or exhibit the modification request. However, the Department in this instance undertook a range of consultation activities. The Department:

- made it publicly available from **Friday 23 November 2018** until **Thursday 13 December 2018** (21 days)
  - on the Department's website
  - at the offices of the Department
  - at Port Stephens Council's (Council) office
- notified landowners/occupiers in the vicinity of the site about the exhibition period by letter
- notified and invited comment from relevant State Government authorities and Port Stephens Council by letter
- advertised in the Port Stephens Examiner and the Newcastle Herald
- inspected the site.

The Department notified the following agencies of the exhibition: Fire and Rescue NSW (FRNSW), Environment Protection Authority (EPA), Office of Environment and Heritage (OEH), Hunter New England Local Health District (HNELHD), Hunter Water Corporation, TransGrid, Department of Industry (DoI), the Rural Fire Service (RFS) and SafeWork NSW. The Department also sent a letter to the Local Member for Port Stephens, notifying of the exhibition of the modification request.

5.2 Summary of Submissions

During the exhibition period, a total of nine submissions were received, all from government agencies and Council. Of the submissions received, none objected to the development. No public submissions were received.

Council did not object to the modification request but provided comments on the increased capacity of the facility including the footprint, vehicle movements and stormwater runoff, the cumulative impact on the ecological constraints of the site, water quality and traffic impacts.

The **EPA** did not object to the modification request but sought further information on the TTP process description and proposed plant configuration. It also requested an updated air quality impact assessment (AQIA) that provided:

- a robust assessment of the cumulative ground level concentrations
- an assessment based on actual emission performance consistent with best practice rather than nominal emission discharges
- an assessment that adequately considers all pollutants from each source
- an assessment of the ground level concentrations for cadmium and polycyclic aromatic hydrocarbons (PAHs) and compared emissions with prescribed limits contained in the *Protection of the Environment Operations (Clean Air) Regulation 2010* (Clean Air Regulation)
- clarification on the sensitive receptor locations.

The **HNELHD** did not object to the modification request, however sought further information on the AQIA and requested the Proponent use appropriate guidelines in relation to stormwater harvesting.

FRNSW raised no objection to the modification and requested that a Fire Safety Study (FSS) be undertaken for the site in accordance with the Department's Hazardous Industry Planning Advisory Paper No 2: Fire Safety Guidelines

(January 2011) (HIPAP 2). FRNSW requested it be consulted during preparation of the FSS (via a meeting) to determine firefighting requirements.

Hunter Water Corporation raised no objection to the modification request and noted the assessment addressed potential impacts on the Tomago Sandbeds adequately.

TransGrid raised no objection and noted the modification request does not impact on TransGrid infrastructure.

The **OEH** raised no objection or requirements for the modification request in relation to biodiversity, aboriginal cultural heritage or flooding.

The **DoI** raised no objection to the modification request

The **RFS** raised no objection for the modification request.

SafeWork NSW did not make a submission on the proposal.

5.3 Response to Submissions

On 1 April 2019, the Proponent submitted a response to submissions (RtS) report (**Appendix D**) to address the issues raised in the submissions. The RtS was accompanied by a revised AQIA.

The RtS was provided to key agencies to consider whether it adequately addressed the issues raised. A summary of the agencies responses is provided below:

Council advised the RtS addressed many of its issues raised and requested the Construction Environmental Management Plan (CEMP) address surface and groundwater and biodiversity management

The **EPA** was satisfied that most of the air quality issues had been addressed in the revised AQIA, however the EPA did not agree with the methodology used by the Proponent for assessing PAHs and requested additional information on the assessment approach for PAHs. The EPA also stated in the absence of further assessment accounting for the cadmium (Cd) emissions from other significant sources, a revised Cd limit of 0.018 mg/m^3 is recommended for both processing kilns.

The **HNELHD** advised the HNELHD would provide additional comment on the health impacts when the EPA were satisfied with the air quality impact assessment.

FRNSW, following discussions with the Proponent no longer required a FSS be prepared.

The Proponent provided additional information on air quality on 24 May 2019. On the 13 June 2019, the **EPA** provided recommended conditions of approval in relation to the limit and monitoring conditions.

The **HNELHD** provided no further comment.

6. Assessment

The Department has assessed the merits of the proposed modification. During this assessment, the Department has considered the:

- EA and assessment report for the original application
- existing conditions of approval (as modified)
- the EA supporting the proposed modification (**Appendix A)**
- submissions from State government authorities and Councils (**Appendix B**)
- the Proponent's response to issues raised in submissions
- relevant environmental planning instruments, policies and guidelines
- requirements of the EP&A Act, including the objects of the EP&A Act.

The Department considers the key assessment issues are air quality and human health

The Department's assessment of other issues is provided in **Table 4**.

6.1 Air Quality Impacts

The increase in processing capacity of SPL has the potential to release a range of air pollutants which could result in air quality impacts if not appropriately managed. To assess the impacts of the modification request, the Proponent submitted an Air Quality Impact Assessment (AQIA) prepared by AECOM in accordance with the Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales (the Approved Methods) (EPA 2017).

The EPA required additional information upon its initial review of the of the AQIA (see **Section 5.2**). The revised AQIA provided in the RtS is the focus of this assessment.

The primary air emissions associated with the thermal treatment and processing of SPL are hydrogen fluoride (HF) and sulfur dioxide (SO_2) as well as nitrogen dioxide (NO_2), carbon monoxide (CO), and particulate matter (PM_{10} and $PM_{2.5}$), heavy metals (including Cd, lead (Pb), cyanide (CN) and arsenic (As)), PAHs and dioxins and furans, which at certain concentrations may impair air quality and human health as well as the health of plants and animals. The main emission sources for the project would be:

- existing 20,000 tpy rotary kiln stack
- proposed 40,000 tpy rotary kiln stack
- proposed drying plant stack
- proposed Shed 5 stack
- proposed fine grinding mill plant

The modification request does not propose to alter the existing emission control equipment on the 20,000 tpy TTP. The Proponent is seeking approval to install a baghouse exclusively for Shed 5 (currently a baghouse is shared between the deline facility and Shed 5).

The AQIA included a Level 2 impact assessment which used site specific input data and ambient background monitoring data. Background ambient monitoring data was sourced from OEH's Beresfield continuous monitoring station (located approximately 8 km northwest from the site) for the period between January 2015 to December 2015. Ambient background HF and SO_2 data was sourced from monitoring stations operated by the Smelter as

shown in **Figure 12**. Meteorological data was sourced from the Bureau of Meteorology's (BOM) Williamstown Airport (located approximately 12 km northeast from the site). The EPA raised no issue with the background monitoring data obtained and considered it to be representative of the ambient air quality conditions in the local air environment. The AQIA included dispersion modelling using CALPLUFF to analyse if the modification request would comply with the relevant assessment criteria in the Approved Methods.

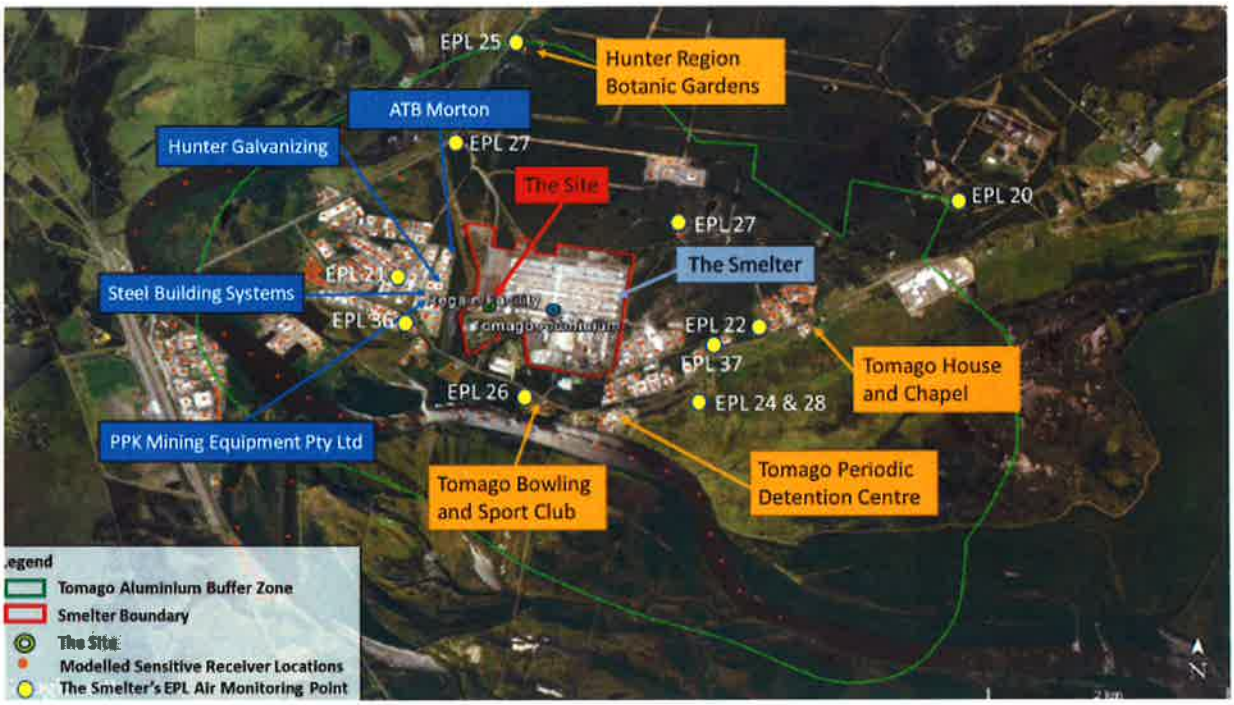

Figure 12 | Modelled Sensitive Receiver Locations

To determine whether the predicted emissions from the proposed development would comply with the relevant EPA assessment criteria, the AQIA modelled two operational dispersion model scenarios. Scenario 1 predicted the maximum cumulative ground level concentrations for the 'average' typical operating scenario and scenario 2 adopted the proposed maximum EPL concentration limits for calculating the expected mass emission rates. The EPA did not consider the use of average monitoring data in scenario 1 to be consistent with the Approved Methods, and considered scenario 2 a more conservative scenario, as it modelled the facility operating at its maximum proposed emission limits (rather than typical emissions) which are based on actual emission performance of the proposed plant design which is consistent with best practice.

Scenario 2 demonstrated compliance with the relevant ground level concentrations (GLC) for all criteria at the boundary of the site and also at all sensitive receivers (both industrial and residential) with the exception of HF which exceeded the GLC criteria for the 30 day averaging period of 0.97 $\mu g/m^3$ (when compared to the criteria of 0.84 $\mu g/m^3$) on a small portion at the entrance of four industrial receivers located 500 m to the west of the site. The predicted incremental HF isopleth is presented in **Figure 13**. The four industrial receiver's operations occur within an enclosed building which would minimise the employee's exposure to HF.

The AQIA undertook further analysis of the cumulative ground level concentrations for HF, which examined the sites incremental contributions at the same location as each of the ambient monitoring sites. Under scenario 2 the HF incremental contributions from the modification request at the ambient station locations are less than the respective background level concentrations. The analysis demonstrated that the facilities incremental impacts at the ambient monitoring sites are all at least an order of magnitude lower than the respective ground level concentration limits. This would indicate that the elevated background values are unlikely to be significantly influenced by the modification.

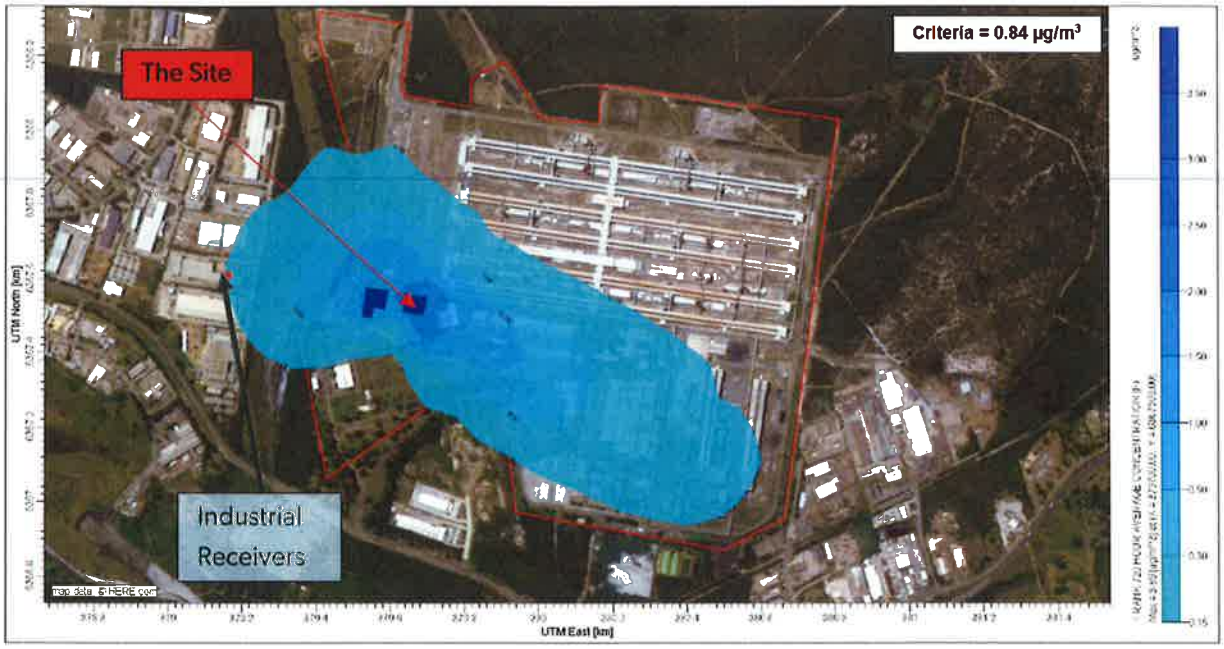

Figure 13 | Maximum Incremental 30-day (720-hour) Hydrogen Fluoride Isopleth 100th Percentile

The AQIA also included mass balance information on some of the key pollutants associated with the proposal (fluoride and cyanide). The mass balance indicated that >99.99 % of cyanide and fluoride are retained with the processed SPL. The EPA noted that whilst the AQIA did not compare emission performance of the other mitigation measures, the mass balance information provided for fluoride and cyanide indicated that a sufficient level of control can be achieved. The Proponent has proposed the following mitigation measures at the site:

- an enclosure for SPL handling and preparation plant with a dedicated dust extraction system with filtration
- enclosure of material transfer points with subsequent dust extraction and filtration for the external plant and equipment
- filtration in form of baghouses for the two new point source discharges (the fine grinding plant stack and the processing kiln)
- temperature control of the thermal treatment process (maintain temperature below 850°C) to minimise gaseous fluoride.

The EPA noted that given this information, investigation of additional mitigation measures is not warranted, however monitoring requirements would be recommended to demonstrate ongoing environmental performance.

The Department has considered the comments from the EPA and recommended the following conditions of approval which require the Proponent to:

- meet stringent emission limits for the existing 20,000 tpy rotary kiln, the proposed 40,000 tpy rotary kiln and the fine grinding mill
- conduct continuous and 6 monthly monitoring of the existing 20,000 tpy rotary kiln, proposed 40,000 tpy rotary kiln and fine grinding mill
- prepare a post commissioning air emission verification report within 12 months of commissioning the new rotary kiln and fine grinding plant and compare the results of the post commissioning monitoring against the emission limits contained in the EPL
- prepare an operational air quality management plan.

The Department has reviewed the AQIA and the RTS and based on the information provided, the Department considers no adverse impacts on human health and the environment are unlikely to occur as a result of an increase in the processing capacity of SPL at the facility. The Department considers:

- the site is located within an existing industrial area, within an approved buffer zone which surrounded by industrial receivers
- the potential exceedance of the GLC criteria for the 100th percentile 30-day HF concentration were based on a worst-case operational scenario that's unlikely to occur over a 30 day period
- the Proponent has proposed mitigation measures to minimise and mitigate any potential air discharges.

The Department has recommended a range of air quality conditions based on the recommendations of the EPA including emission limits, monitoring requirements and post commissioning air emission verification report. The Department has also recommended an operational air quality management plan is prepared by the Proponent prior to operation.

The Department's assessment concludes that with the implementation of recommended conditions and the Proponent's proposed mitigation measures, any air quality impacts from the project would be adequately managed to minimise impacts on the surrounding receivers.

6.2 Other Issues

The Department's assessment of other issues is provided in **Table 4**.

Table 2 | Summary of other issues raised

Findings	Recommended Condition
Hazards and Risks	
• The increase in the processing capacity of SPL has the potential to increase hazards and risks at the facility. • The existing site is considered a potentially hazardous development under State Environmental Planning Policy No. 33 (SEPP 33) Hazardous and Offensive Development. This is due to the storage of SPL (DG Class 4.3) in Shed 5, which exceeds the one tonne screening threshold quantity identified in the Department's Hazardous and Offensive Development Application Guidelines Applying SEPP 33. • The modification does not include an increase in SPL storage, nor any significant changes to Shed 5 which would increase the SPL storage. <u>Preliminary Hazard Analysis</u> • To address any further hazards and risks considerations for the proposal, the EA included a gap analysis and a preliminary screening analysis was undertaken against the Preliminary Hazard Analysis (PHA) prepared by SKM as part of the original application. • The Department considers the gap analysis is generally consistent with the Department's Hazardous Industry Planning Advisory Paper (HIPAP) No. 6, Hazard Analysis. • The gap analysis identified the change of the site risk profile would be minimal and would not increase risk exposures to surrounding land uses to unacceptable levels. • FRNSW was satisfied with the gap analysis and initially requested a FSS be prepared, however upon further consultation with the Proponent, FRNSW was satisfied a FSS was not required. • The Department has recommended a number of hazards related conditions of approval consistent with HIPAP No 12-Hazards Related condition of approval including: o limiting the maximum throughput of SPL that can be treated onsite o preconstruction requirements including a Hazard and Operability Study (HAZOP) and Construction Safety Study (CSS) o updating the site Emergency Plan (EP) and Safety Management System (SMS) o a comprehensive hazard audit of the modification, 12 months after the commencement of operations of the modification and five years thereafter. • Based on the gap analysis, the Department is satisfied the increase in processing capacity of SPL at the facility would not the change the **sites** risk profile and would not increase the risk exposure to surrounding land uses to unacceptable levels. <u>Transport of SPL</u> • The modification is also potentially hazardous in terms of dangerous goods (DG) transport, given that SPL transport to the facility exceeds the DG Class 4.3 PG III threshold quantity in the Department's Hazardous and Offensive Development Application Guidelines Applying SEPP 33. • Transport route selection is required to be considered for vehicles transporting DG, the Proponent in accordance with the Department's	Require the Proponent to: • limiting the maximum throughput of SPL to be treated onsite • pre-construction requirements including a Hazard and Operability Study (HAZOP) and construction safety Study (CSS) • updating the site Emergency Plan (EP) and Safety Management System (SMS) • a comprehensive hazard audit of the modification, 12 months after the commencement of operations of the modification and five years thereafter.

HIPAP No.11 Route Selection has identified transport routes and included ranking based on the HIPAP No. 11.

- The EA identified a number of routes as suitable DG transport routes for transporting SPL to the facility. These included:
    - Kurri Kurri Smelter, Route A1, (Hunter Expressway, John Renshaw Drive, New England Highway, Pacific Highway and Old Punt Road).
    - Port of Newcastle, Route B1 (Cormorant Road, Tourle Street, Industrial Drive, Maitland Road, Pacific Highway and old Punt Road),
    - Rail Terminal, Carrington, Route C1 (Selwyn Street, George Street, Industrial Drive, Maitland Road, Pacific Highway and Old Punt Road and D1
    - Rail Terminal, Sandgate, Route D1 (old Maitland Road, Maitland Road, Pacific Highway and Old Punt Road).
- These routes are the existing routes being used by the facility. As such, the Department considers that the existing routes remain appropriate for the modification request.

Conclusion

- The Department's assessment concludes the increase in the processing capacity does not increase risk exposures to surrounding land uses to unacceptable levels and the transport of SPL will continue to use the existing transport routes which are suitable DG transport routes. The Department has recommended a number of hazards related conditions which will further reduce the potential risks from the modified facility.

Human Health

- The treatment and processing of SPL has the potential to generate air emissions that may be harmful to human health over the short and long-term.
- The EA included a Human Health Risk Assessment (HHRA) prepared by AECOM. The HHRA assessed potential health risks to surrounding off-site human receptors resulting from exposure to air emissions associated with the modification request. The HHRA considered both air emissions generated by the modification request during typical operating conditions and the proposed maximum EPL limits
- The HHRA was undertaken in accordance with relevant nationally adopted guidelines for health risk assessment, including the Environmental Health Risk Assessment: Guidelines for Assessing Human Health Risks from Environmental Hazards and Department of Health and Ageing and enHealth Council, Commonwealth of Australia (enHealth, 2012a). The Proponent also utilised international sources of information relevant to the thermal treatment of waste.
- Two operating scenarios (typical operating conditions and operational conditions at the proposed maximum EPL limits) were considered as part of the HHRA. Scenario 1 was based on standard operating conditions with the facility operating continuously at the proposed 60,000 tonne per year SPL processing limit. Scenario 2 were representative of the theoretical worst case impacts using the proposed maximum licence limits and which is unlikely to occur.
- Under scenario 1, it was considered the estimated health risks to off-site residents, recreational users and commercial workers from vapour and particulates emitted from the site was considered low and acceptable.
- Under scenario 2, it was considered the estimated health risks to off-site residents, recreational users and commercial workers from inhalation and residents from direct contact pathways under normal and proposed maximum licence limit operating conditions was considered low and acceptable.

- No recommended conditions

- The Proponent proposes to implement design and operational controls to minimise emissions to ensure human health risks remain low and acceptable.
- The HNELHD generally supported the conservative assumptions adopted to assess the potential air quality from the proposal and did not recommend any conditions of approval.
- The Department's assessment concludes the proposed facility can be managed to ensure risks to human health are low and acceptable.

Stormwater Management

- The increase in the processing capacity of SPL has the potential to contaminate stormwater which could impact on the health of the Hunter River.
- All handling of SPL occurs within Shed 5 (due to its reactive nature with water) and treated SPL occurs within Shed 6 on a bunded hardstand to prevent potential SPL spills. Any water captured within the bunded area is directed to a dedicated first flush settling chamber and sump to capture any sediment or debris, the captured stormwater is reused as part of the existing treatment process.
- Any discharges from the existing site are limited to stormwater discharges outside the bunded area and directed to the Smelter's existing stormwater management system which consists of a first flush pond. The first flush pond allows stormwater to be collected where fluoride levels are monitored and then discharged off-site to the Hunter River. This is regulated by the Smelter's EPL No. 6163.
- The EA included a water balance which identified the modification would not change the site's water balance (the modelling also included the sealing of the gravel hardstand located outside shed 6) as there were minimal changes to the existing hardstand areas or impervious surfaces.
- The modification proposes to upgrade the site's stormwater management system in accordance with Council's Stormwater Drainage Handbook and capture stormwater outside the bunded area for reuse in the TTP reactor or as dust suppression within Shed 6. The proposed stormwater upgrades are summarised in **Section 2.2** of this report and illustrated in **Figure 11**.
- The stormwater upgrade design will allow for runoff to be captured during a 1 in 1 year storm event. Excess stormwater would be discharged to the Smelter's first flush pond.
- Council, Hunter Water and the EPA did not provide any comments regarding the proposed upgrade to the stormwater management system. The EPA did not recommend any stormwater discharge monitoring requirements.
- The Department considers the proposed stormwater upgrades including the capture and reuse of stormwater will improve the Proponent's capability to manage the quantity of stormwater at the site and minimise the quantity of stormwater discharged to the smelter's stormwater system. The Department has recommended conditions of approval that requires the Proponent:
  - to construct the stormwater management system prior to the commencement of operations
  - seal the existing gravel hardstand
  - ensure works-as-executed drawings are signed by a registered surveyor demonstrating that the stormwater drainage and finished ground levels have been constructed as approved
  - install standard erosion and sediment controls.
- The Department concludes the proposed upgrades to the water management system will improve the management of stormwater and reduce the quantity and improve the quality of stormwater discharged to the smelter's stormwater management system.

Require the Proponent to:

- design and install stormwater management system prior to the construction
- provide works as executed plans for the stormwater management system prepared by a registered surveyor

Greenhouse Gas

- The modification could increase greenhouse gas (GHG) emissions due to the proposed increase in processing capacity.
- The EA included a GHG assessment prepared by AECOM to assess the contribution of the modification to the emission of GHG (carbon dioxide, methane, nitrous oxide, synthetic gases and hydrofluorocarbons) to atmosphere.
- The GHG assessment considered scope 1 – direct emissions and scope 2 emissions – emission released to atmosphere from indirect consumption.
- The GHG assessment found that GHG emissions for the modification would increase from 1,611 tonnes CO_2-**e** to 4,834 tonnes CO_2-e per year. This is largely attributed to the proposed operation of the additional rotary kiln and increasing the processing capacity from 20,000 up to 60,000 tonnes per year, which accounts for 0.0044 % of the total current NSW emissions.
- The Proponent identified to reduce GHG emissions it will ensure all plant equipment is well maintained, reduce light oil usage and undertake an energy audit for the site to identify potential energy efficiency opportunities.
- The Department's assessment concludes the impact of the modification on GHG emissions is negligible.

Require the Proponent to:

- maintain all plant and equipment to ensure it is working in an efficient manner.

Waste Management

- There is a risk that processing increased volumes of SPL waste has the potential to cause impacts on the surrounding area if not appropriately stored or managed.
- The modification seeks to increase the throughput of SPL from 20,000 tpy to 60,000 tpy. The modification does not include an increase in SPL storage, nor propose any significant changes to Shed 5 which would increase the SPL storage.
- The EA suggests that up to 8,000 tonnes of SPL can be stored in Shed 5 at any one time and it is estimated that up to 15,000 tonnes of treated SPL can be stored in Shed 6 at any one time. The storage capacity of each Shed is estimated at 20,000 tonnes. There are no storage limits on the original consent.
- The EA proposes with the installation of the additional TTP, the maximum throughput rate would be 9 tonnes per hour and the maximum daily throughput would be 216 tonnes of SPL. The EA also suggests that up to 10,000 tonnes of treated SPL could be dispatched from site within any one-month period or up to 120,000 tonnes within any 12 month period.
- The Department has recommended the maximum throughput of SPL that can be processed at the site is capped at 60,000 tonnes per year. The Department has also recommended a condition requiring the Proponent to undertake a Hazard Audit to assess compliance with ADGC.
- The Department considers based on the storage capacity of SPL and treated SPL, the storage capacity of Shed 5 and 6 and the environmental controls at the site, the facility has adequate capacity to increase the throughput of SPL from 20,000 tonnes per year up to 60,000 tonnes per year.
- The Department's assessment concludes the facility can manage the increase throughput of SPL waste as there is sufficient storage capacity and appropriate controls in place in the event of a spill.

Require the Proponent to:

- to comply with existing waste conditions.

Noise

- The modification has the potential to generate additional noise during construction and operation which could impact the amenity of the locality.

Require the Proponent to:

- To support the NIA prepared in the original application, the modification included an additional noise model prepared by AECOM to consider the potential noise impacts associated with the additional TTP and increasing processing capacity.
- The modelling was prepared in accordance with the 'Noise Policy for Industry' (NPI) (EPA, 2017), 'Assessing Vibration: a technical guideline' (DEC, 2006) and the 'Interim Construction Noise Guideline' (ICNG) (DECC, 2009).
- Noise impacts at the site during construction are predicted to satisfy the Noise Management Levels (NMLs) at all receivers. No out of hours work is proposed. The Proponent proposes to employ best practice construction noise mitigation measures in accordance with the ICNG.
- Operational noise is predicted to be well below the existing noise limits for the site during day and night time periods.
- The NIA predicts any change in noise impacts at the closest recreational receiver the Tomago Bowling & Sporting Club would be no greater than 0.8 dB (under a worst-case weather scenario with calm conditions).
- Existing conditions of the approval requires the Proponent to undertake construction activities within standard construction hours and compliance with existing noise limits for the site. The current approval prescribes noise limits for the site. The Department does not propose to amend the existing noise conditions.
- The Department's assessment concludes the predicted noise impacts of the modification, being a worst case 0.8 dB increase at the nearest recreational receiver are minor and acceptable.
- No additional conditions are required to manage residual operational noise impacts as a result of the modification.

- comply with the standard construction hours and achieve the construction noise management levels specified in the ICNG
- comply with existing noise limits for the site.

7. Evaluation

The Department has assessed the modification request in accordance with the relevant requirements of the EP&A Act. The Department considers the modification request is appropriate on the basis that:

- it would result in minimal environmental impacts beyond the approved facility
- it would result in minimal environmental impacts beyond the approved facility
- it would result in a hazardous waste being treated to remove its hazardous properties and beneficially reused
- the SPL handling process and robust and appropriate
- the modified project would result in acceptable hazard and risk impacts on off-site receivers
- the modified project would meet relevant air quality limits at sensitive receivers

The Department is satisfied that the modification request should be approved, subject to conditions.

8. Recommendation

It is recommended that the Director, Industry Assessments, as delegate for the Minister for Planning:

- **considers** the findings and recommendations of this report
- **determines** that the request (06_0050 MOD 2) falls within the scope of the former section 75W of the EP&A Act
- **determine** that the environmental assessment requirements have been addressed
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to grant approval to the application
- **modify** the consent MP06_0050
- **signs** the attached modification of approval (**Appendix A**).

Recommended by:

Susan Fox
Senior Environmental Assessment Officer
Industry Assessments

9. Determination

The recommendation is: **Adopted by:**

Kelly McNicol 22/08/19.

Acting Director

Industry Assessments

Appendices

Appendix A - Notice of Modification

Appendix B – Environmental Assessment

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=9524

Appendix C – Submissions

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=9524

Appendix D – Submissions Report

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=9524