# WATER MANAGEMENT PROGRAM

***TABLE OF CONTENTS***

## *LIST OF TABLES*



## *LIST OF FIGURES*

# 1. Introduction

## 1.1. Purpose

The purpose of this Water Management program is to describe the water management and appropriate environmental management practices employed at TAC to:

1) Ensure compliance with Development Consent and POEO licence conditions, and other regulatory requirements;

2) Promote a systematic approach in environmental releases management through the effective use of management systems and continual improvement in environmental performance;

3) Ensure water is appropriately managed to prevent environmental damage on-site and off-site;

4) Eliminate the risk to personnel from ingestion of contaminated water (e.g. from Legionella or from recycled effluent).

## 1.2. Scope

This program addresses the management of water within the Tomago Aluminium smelter. Water usage, stormwater, groundwater, process waters and sewage are covered by this management program.

Water management at the Wallaroo Waste Facility is included in *Wallaroo Waste Management Plan ES.EMS.0003*.

This program is applicable to TAC personnel and contractors working on site at Tomago Aluminium.

## 1.3. Background

Tomago Aluminium is located in the industrial suburb of Tomago, which is part of the Port Stephens Local Government Area. Production of aluminum commenced in September 1983, and smelter reached full operating capacity in 1984.

In 1993, Potline No 3 was commissioned and additional pots were installed on the original two potlines in 1998. In recent years production expansion has occurred through upgrades in the aluminum smelter cell design.

## 1.4. Site Description

The Tomago Aluminium site is on the southwestern edge of an extensive low-lying area of sand dunes and flats. The site is adjacent to the Hunter River.

Groundwater on the site is at a variable depth averaging approximately 3.2m and site groundwater flow is in a southeast direction towards the river. A groundwater divide occurs north of Potline 3 and groundwater to the north of this divide flows

to the Tomago Sandbeds, which is used as a drinking water supply for the Newcastle region.

Stormwater from the site passes through a sedimentation basin before it is stored in a retention pond prior to discharge to the Hunter River.

The major use of potable water is in make-up of evaporation losses from closed loop recirculated cooling water systems used for metal casting and compressed air services.

All process waters generated from site activities are collected in on-site sumps where the water is either treated and reused or disposed of by licensed contractors. Sewage generated from the site is treated by a small processing plant and the treated effluent used for site irrigation. Two water treatment plants are installed on site to treat and reuse oily water from Casthouse and the Steam Clean Bay. These units are operated by Veolia Environmental Services.

## 2. Definitions

2.1. Aboveground storage tank – a stationary hazardous chemical tank with a minimum capacity of 450 litres

2.2. Field-constructed sumps – underground sumps and tanks that were fabricated through traditional fabrication techniques. This includes:

- Forming and pouring of concrete sumps; and
- Cutting and welding of steel / plastic sump systems

2.3. Hazardous Chemical – includes all chemical substances that if spilled have the potential of a significant impact on the environment and/or would require remediation.

2.4. Spill – non- routine release/leakage of a pollutant;

2.5. Stormwater –rainfall runoff from the Tomago Aluminium site travelling via the drainage system

2.6. Groundwater – sub-surface waters contained in the aquifer between 1 and 6 metres below the surface.

2.7. Process waters – waters used for any of Tomago Smelters' activities that are separated from the stormwater system and contained in sumps or ponds for later treatment and/or disposal.

2.8. Treated Effluent – waters treated by the Sewage Treatment Facility incorporating the two Maturation Ponds and used for on-site irrigation (via a sprinkler system).

## 3. Legal Requirements

An **Environmental Legal and Other Requirements Register** is maintained as part of the Environment Management System. A summary of the key legal requirements relating to water management for the TAC site are provided below:

### 3.1. Protection of Environment Operations Act

- Section 120 of the POEO Act which requires that TAC must not pollute waters.

### 3.2. Protection of the Environment Operations (POEO) Act Licence

- The Environment Protection Licence identifies 3 discharge points and concentration limits. The EPL also defines monitoring requirements that are mandatory. **Table 1** describes the details of the discharge points and concentration/volume limits and **Table 2** details the monitoring requirements for the EPA licence discharge points.
- Pollution Studies and Reductions Programs (PRP's) on EPL licence 6163 are listed in **Table 3**.

*Table 1: EPA Discharge Points and Limits*

| EPA Identification no. | Type of discharge point | Description of Location | Concentration / volume limits |
|---|---|---|---|
| 16 | Controlled stormwater discharge to Hunter River | The point of discharge to the Hunter River<br>Drawing Ref 00400C0500 | Fluoride 40 mg/L<br>Total Sus. Solids 50 mg/L<br>pH 6.5-8.5<br>Volume 4320 kL/day |
| 17 | Treated effluent land application | Effluent utilisation area | Volume 30 mm/week |
| 35 | Stormwater overflow discharge to the Hunter River | Overflow from first flush stormwater system | N/A |

*Table 2: Monitoring Requirements at EPA Discharge Points*

| EPA Identification No | Pollutant | Unit of Measure | Frequency | Sampling Method |
|---|---|---|---|---|
| 16 Controlled stormwater discharge to Hunter River | Conductivity | Microsiemens per centimetre | Daily during any discharge | Grab sample |
| | Fluoride | mg/L | Daily during any discharge | Grab Sample |
| | pH | pH | Daily during any discharge | Grab Sample |
| | Polycyclic aromatic hydrocarbons (PAH) | mg/L | Each overflow event | Grab Sample |
| | Total suspended solids | mg/L | Daily during any discharge | Grab Sample |
| | Total Recoverable Hydrocarbons (TRH) | mg/L | Each Overflow Event | Grab Sample |
| 17 Treated effluent land application | Biochemical oxygen demand | mg/L | Quarterly | Grab Sample |
| | Fluoride | mg/L | Weekly | Grab Sample |
| | pH | pH | Weekly | Grab Sample |
| | Total Suspended Solids | mg/l | Quarterly | Grab Sample |
| 35 Stormwater overflow discharge to the Hunter River | Fluoride | mg/L | Each overflow event | Grab Sample |
| | pH | pH | Each overflow event | Grab Sample |
| | Polycyclic aromatic hydrocarbons (PAH) | mg/L | Each Overflow event | Grab Sample |
| | Total Recoverable Hydrocarbons (TRH) | mg/L | Each overflow event | Grab Sample |

*Table 3: PRP's pertaining to water management on POEO Licence 6163*

| Clause | Requirement | Current Status |
|---|---|---|
| U1.1 | Install a new stormwater treatment plant by 30 June 2024 with the aim of reducing Fluoride and metals in water to be released under controlled discharge conditions from the site. | Unit selected and on order. Due for install by 30 June 2025 |
| U1.2 | By 31 December 2024 conduct a review of effectiveness of the stormwater treatment plant. The review must:<br>a) Be conducted in accordance with the NSW Water Quality Objectives (NSW WQOs) and the ANZG (2018) Guideline framework to assess pollution impacts to surface water.<br>b) Review effectiveness of the water treatment plant in relation to NSW Water Quality Objectives (NSW WQOs) and the ANZG (2018) Guideline for surface waters<br>c) Recommend actions and implementation timelines for any reasonable and feasible modifications or upgrades required because of this review with the aim to achieve NSW Water Quality Objectives (NSW WQOs) and the ANZG (2018) Guideline at the point of discharge and the mixing zone. | Not yet triggered |
| U1.3 | By 31 December 2025 conduct a review of the first flush treatment system. The review must:<br>a) Provide quantification of the frequency, volume and quality of untreated managed overflows or bypass flows from the first flush system (i.e. discharges that are not captured and/or treated by the stormwater treatment plant)<br>b) Assess the potential management measures to reduce frequency, duration and or volume of untreated overflows into the environment and identify potential mitigation measures, including reducing the volume of contaminated runoff and additional storage and treatment capacity. | Not yet triggered |
| U2.1 | Review and investigation of diffuse water pollution controls<br>a) Investigate and implement reuse of first flush stormwater from the deline stormwater sump into the Regain facility by 31 March 2024.<br>b) Investigate and implement feasible controls on another identified "hot spot" for stormwater contamination on site by 30 June 2024.<br>c) Provide a quarterly report on the measures to control diffuse water pollution including:<br>i) Measures reviewed (including and reasonable and feasible evaluations)<br>ii) Measures implemented; and<br>iii) Progress on implementation on measures | Not required<br><br>Not yet triggered<br><br>Quarterly reports being provided ongoing |
| U2.2 | Provide a report to the EPA by 31 December 2025 detailing the findings of an assessment of all controls implemented to manage the risk of diffuse source water pollution. The assessment must, at a minimum: a) Be undertaken by a suitably qualified person/s<br>b) Review the effectiveness of all controls implemented to eliminate or minimise the risk of diffuse source water pollution at selected sites.<br>c) Where the risk is not effectively eliminated, recommend additional reasonable and feasible enhanced controls to improve protection of waterways from diffuse source water pollution. This may include, but need not be limited to:<br>i) cleaner production techniques<br>ii) preventing stormwater interacting with potential pollutants, e.g. roofing and covers, diversions iii) routine maintenance<br>iv) procedures for installing additional controls including timeframes<br>v) measures used to capture and treat and contaminated runoff waters vi) protection of groundwater<br>d) Provide reasonable and feasible timeframes for the implementation of the controls identified under c)above<br>e) Propose a further location on the Premises to manage diffuse water pollution. The controls to be implemented and relevant timing for installation is also required. | Not yet triggered |

| | | |
|---|---|---|
| U3.1 | Engage a suitably qualified consultant and prepare an On-site Irrigation Plan (OIP) relating to reuse of treated effluent by 31 October 2023. The OIP is to include:<br>a) a review of effluent treatment, storage and reuse at the premises<br>b) A land capacity assessment with reference to the practises and principles in the Environmental Guideline<br>'Use of Effluent by Irrigation', DEC 2004, ("the Guideline")<br>c) Monitoring for the volume and quality of effluent irrigated<br>d) Controls and processes to act as hold points to ensure that only suitable effluent is irrigated<br>e) Quantify the volume, per annum, of effluent generated and quantify the frequency and volume of effluent applied to each irrigation area<br>f) Detail any pre-treatment undertaken prior to the effluent being discharged to any treatment or storage ponds<br>g) Describe the Infrastructure to store and treat effluent prior to irrigation and determine the storage capacity of each effluent treatment and storage pond and provide an assessment of each ponds effluent treatment performance<br>h) Characterise the quality of effluent irrigated and assess the sustainability of effluent reuse at the premises in line with the practises and principles in the Guideline<br>i) Identify any terminal surface runoff capture systems installed, such as terminal contour banks or dams, in accordance with the reuse system design recommendations in the Guideline<br>j) Identify the design wet weather storage capacity and over-topping frequency of the current effluent treatment system;<br>k) Any controls used to ensure that the capacity of the irrigation area is effectively managed (e.g. wet weather controls)<br>l) Detail irrigation practices such as methods of application and methods ensure there is capacity in the soils to receive the effluent without runoff or excessive infiltration to groundwater<br>m) Ongoing monitoring and review<br>Recommend actions and implementation timelines for any modifications or upgrades required because of this review. | Complete |

## 3.3. Development Consent Approvals

The TAC site operates with two Development Consents, the consent conditions associated with water management are detailed in **Table 4**.

*Table 4: Development Consent Condition and Compliance Evidence*

| Development consent condition # | Development consent condition | Compliance evidence |
|---|---|---|
| DA 391-80<br>Condition 5 | that the applicant shall enter into licence agreements with the owners of land within 4 kilometres of the potlines for the purposes of conducting monthly analysis of surface water sites for fluoride levels. Further, the applicant shall obtain the prior consent of the Commission and the Hunter District Water Board (hereinafter called the "Board") to enter upon the Board's lands situate within the Board's catchment area for the purposes of conducting monthly analysis of surface water sites for fluoride levels. Further, the results shall be made available on the first day of each month to the Commission and to the Board and to any monitoring committee which may be established for the purposes of monitoring fluoride emission from the proposed development | 12 surface water monitoring sites established. Agreement with property owners to conduct the sampling. Results available on the first day every month and are reported in the quarterly environment report.<br>(See section 9 and Appendix 2) |

| Development consent condition # | Development consent condition | Compliance evidence |
|---|---|---|
| DA 391-80<br>Condition 6 | that the applicant shall establish and operate monitoring systems as may be required by the Board (including those referred to in Condition 5 above):–<br><br>(a) on the land the subject of the application and the Board's land at Grahamstown, Nelson Bay-Anna Bay and Tomago which lands constitute part of the Board's Catchment Area for the purposes of providing information on the changes in fluoride concentration and determining, from time to time, the level of fluoride concentration therein in groundwater, surface water, rainwater, and on fauna and flora in those catchment areas; and<br><br>(b) at or adjacent to the liquid effluent disposal area on the land for the purposes of checking the level of chemical or bacteriological contamination reaching groundwater and on the movement of the infiltrated effluent relative to local groundwater flow | 8 groundwater monitoring sites established and monitored monthly by Hunter Water. See section 10<br><br>2 surface water sites established and monitored monthly.<br><br>7 vegetation sites established and monitored monthly.<br><br>TAC reports results in quarterly environment report which are provided to Hunter Water.<br><br>(see sections 9, 10)<br><br>5 groundwater monitoring bores in the vicinity of the sewage treatment plant and liquid effluent disposal area monitored for E-coli on an annual basis. Results reported in the Annual Environment Report.<br><br>5 yearly sampling of treated effluent and soil and groundwater at irrigation area. Analysis includes a range of metals and fluoride. |
| DA 391-80<br>Condition 7 | The Applicant shall prepare and implement, an updated Water Management Plan for the development to the satisfaction of the Director-General. This plan must:<br><br>a) be prepared in consultation with DECCW and Hunter Water;<br><br>b) be submitted to the Director-General for approval within 12 months of the approval of DA 391-80 MOD 4;<br><br>c) include a detailed water balance for the development; | This document<br><br>Records of Consultation documentation included in appendix 3<br><br>Record of submission included in appendix 4<br><br>Appendix 1 |

| Development consent condition # | Development consent condition | Compliance evidence |
|---|---|---|
| | d) describe the developments water management system in detail, including:<br>i. the measures that would be implemented to improve water efficiency on site, and reduce the use of potable water;<br>ii. the stormwater management system on site;<br>iii. the treatment and control of wastewater; and<br>iv. the irrigation of effluent to the irrigation area and the management of soil and groundwater in this area.<br><br>e) include a description of:<br>i. the relevant statutory requirements; and<br>ii. the measures that would be used to judge the performance of the water management system, and trigger the implementation of any contingency plans.<br><br>f) include a comprehensive program to monitor and report:<br>i. the water efficiency of the development;<br>ii. the effectiveness of the stormwater management system;<br>iii. the volume of effluent discharged and irrigated on site;<br>iv. the quality of the effluent discharged from the site;<br>v. the effects of the effluent discharges on the ecology of the Hunter River;<br>vi. the effects of the irrigation scheme on the irrigation areas; and<br>vii. on groundwater quality, including the Tomago Sandbeds Water Supply Works.<br><br>g) identify the contingency measures that would be implemented should the impacts of the development approach or exceed the relevant standards or performance measures referred to in f) above;<br><br>h) include a protocol for managing and reporting incidents and complaints; and<br><br>i) include a protocol for periodic review of the plan. | Section 4.1 to 4.4<br><br>Section 5 and Section 9.1<br><br>Section 6<br>Section 6.1.2<br><br>Section 3<br><br>Section 11<br><br>Included in Quarterly and annual Environment Reports submitted to:<br>Environment Protection Authority<br>National Parks and Wildlife service<br>Department of Primary Industries<br>Port Stephens Council<br>Hunter Water<br>Department of Planning<br><br>Section 11: Contingency Measures |
| DA 391-80<br>Condition 9 | that the applicant shall immediately inform the Board of any action or occurrence on the site which may affect the Board's water supply. Further, the applicant shall, in order to remedy any defect arising out of the action or occurrence, comply forthwith with the requirements of the Board; | Section 11: Contingency Measures |
| DA 391-80<br>Condition 12 | that the applicant shall, prior to the commencement of the smelter operations, complete all drainage, paving, materials handling and storage systems and effluent treatment plant with ancillary liquid effluent disposal systems, in accordance with the requirements of the Commission and the Board; | State Pollution Control approval 270559C3 issued 26 May 1983. All work was completed prior to the commencement of the expanded smelter operations in 1993 |

| Development consent condition # | Development consent condition | Compliance evidence |
|---|---|---|
| DA 391-80<br>Condition 15 | that the applicant shall, in accordance with the requirements of the Commission, provide filtering and purifying systems or such other alternatives, such as reticulated water, as approved by the Commission, to existing farm and residential properties which depend on tank or dam water for domestic and stock purposes provided that such farms and residential properties are within 2 kilometres of the site of the proposed development or at such other distance as determined by the Commission, to prevent the concentration of fluoride in these water supplies exceeding:–<br>(a) in the case of water for human consumption 1.0 mg/litre;<br>(b) in the case of water for stock, crop and other domestic uses, a level prescribed by the New South Wales Department of Agriculture; | This is an original condition. All residential properties within 2 km of the smelter were on the Hunter Water reticulated water.<br>Tomago Aluminium purchased rural properties adjacent to the smelter in the 1980's and no water quality issues identified |
| DA 4980/90<br>Condition 6 | The Applicant at its own expense shall ensure, prior to commencement of the expanded smelter operations forming part of the development, that there is in operation an adequate water management scheme, for process water, surface water runoff, Pollution control and discharge in accordance with the requirement of the commission | Pollution Control Approvals obtained from State Pollution Control Commission<br>Number 91/227H (12th November 1991)<br>Number 002986 (24th February 1997) |
| DA 4980/90<br>Condition 7 | The Applicant at its own expense shall complete, prior to the commencement of the expanded operations forming part of the development, all drainage, paving, material handling and storage systems and the effluent treatment plant with ancillary liquid effluent disposal systems, in accordance with the requirements of the commission and the Hunter Water Board ('the Board") | Pollution Control Approvals obtained from State Pollution Control Commission<br>Number 91/227H (12th November 1991)<br>Number 002986 (24th February 1997)<br>All work completed prior to the commencement of the expanded smelter operations in 1993 |
| DA 4980/90<br>Condition 10 | The Applicant at its own expense shall establish and operate revised monitoring systems as may be required by the Board.<br>(a) On the land the subject of the application and on any of the Board's lands, at Grahamstown, Nelson Bay, Anna Bay and Tomago, which constitute part of the Board's catchment areas, for the purposes of providing information on changes in fluoride concentration and determining from time to time, the level of fluoride concentration therein in groundwater, surface water, rainwater and in fauna and flora in those catchment areas.<br>At or adjacent to the liquid effluent disposal area on the land for the purposes of checking the level of chemical or bacteriological contamination reaching groundwater and on the movement of the infiltration effluent relative to the local groundwater flow. | Correspondence WB/EM 859 (27 November 1992) regarding environment monitoring programme. Included additional vegetation monitoring sites, establishment of groundwater monitoring sites in Hunter Water land |
| DA 4980/90<br>Condition 11 | The Applicant shall continue the monitoring and reporting program as currently agreed with the Board and the commission, in the vicinity of the smelter expansion and shall only vary the program if agreed by these two authorities | Monitoring program still undertaken with results reported to the EPA and Hunter Water in the Quarterly and Annual Environment Reports |

| Development consent condition # | Development consent condition | Compliance evidence |
|---|---|---|
| DA 4980/90 Condition 12 | The applicant shall immediately inform the board of any action or occurrence on site which may affect the Board's water supply. Further, the applicant shall, in order to remedy any defect arising out of the action or occurrence comply forthwith with the requirements of the Board. | Monitoring program in place. No impacts on Hunter Water Supply detected. Notification requirement included in TAC's Environment Management System document *ES.EMS.0014 Environment Reporting Program* |
| DA 4980/90 Condition 13 | The Applicant shall, in the event of any deleterious effect to the Board's water supply which effect can be attributed to the expanded smelter operations, re-examine the water management scheme and shall make such adjustment to that scheme as may be required by the Commission and the Board. Further the applicant shall bear any costs incurred by the Board to remedy the defect in the water supply. | Monitoring program in place. 8 groundwater monitoring sites establish in Tomago and Williamtown sandbeds. (sites 53,54,55,56,57, 58, 62,63) see Section 10 for detail.<br>No impacts on Hunter Water Supply detected. |
| DA 4980/90 Condition 14 | The Applicant shall install additional monitoring bores in the vicinity of the proposed stormwater surge basin (shown on figure 5.1 of the 1990 EIS as a stormwater retention pond to the north of the new potline and located within the gazetted catchment area, test samples from these bores each month or as agreed, and supply the results to the Board and Commission. If the results are not satisfactory to the Board, The applicant shall take remedial action as agreed by the Board. | Groundwater monitoring sites 219,220 and 221 established in the vicinity of the surge basin and sampled monthly. 8 groundwater sites established in the gazetted catchment area and sampled on behalf of TAC by Hunter Water. Results supplied to the EPA and Hunter Water in the Quarterly and Annual Environment Reports. These reports are prepared and sent within 6 weeks of the end of the reporting period. See Section 10 for detail. |
| DA 4980/90 Condition 16 | The Applicant shall install additional monitoring points, as required by the Board, if contamination becomes evident within the catchment area | No requirement to install additional monitoring points by Hunter Water to date. Section 11 Contingency Measures would be implemented if contamination detected. |
| DA 4980/90 Condition 17 | The applicant shall, as required by the Board, replace any existing samplings points affected by the smelter expansion to an agreed location nearby, and establish an adequate correlation of results by taking samples from original and relocated sampling points. | HWC site No W8046,W8049 and W8054 deleted due to construction of Potline 3. Following consultation with Hunter Water sites BL61,BL56,BL57,BL134,SK5871,SK5 775 TAC508 and BL46A established. Bores monitored by Hunter Water at Tomago Aluminium's expense. |

| Development consent condition # | Development consent condition | Compliance evidence |
|---|---|---|
| DA 4980/90<br>Condition 48 | The Applicant shall ensure that, unless already included in the environmental monitoring program required under condition 5, the following requirements are met to the satisfaction of NSW Agriculture and Fisheries, the Commission, the Board, NPWS and the Director<br>(a) Monitoring of stormwater discharge from the Applicant's property to establish levels of possible pollutants, including fluoride, heavy metals and cyanide, discharged to the hunter River, to be undertaken at a point or points to be selected and agreed upon by the applicant and the authorities referred to above.<br>(b) A bio-accumulation and sediment monitoring program for fluoride and other relevant substances be established at the nearest feasible location or locations downstream from where the stormwater discharge enters the Hunter River with the experimental design being developed in consultation in NSW Agriculture and Fisheries. | Samples of stormwater taken and analysed for filterable Iron, Silver, Aluminium, Arsenic, Beryllium, Cadmium, Cobalt, Chromium, Copper, Manganese, Nickel, Lead, Antimony, Selenium, Thallium, Zinc, Mercury, Cyanide and Fluoride. Results reported in Quarterly and Annual Environment Reports that are supplied to EPA, NPWS, Department of Primary Industries (NSW fisheries), Hunter Water and Department of Planning and Environment.<br>Oyster and sediment monitoring program conducted with results included in the Annual Environment Report.<br>Correspondence with NSW Agriculture and Fisheries .<br>NR/EM. 1327 (15 February 1995)<br>NR/EM 1335 (1 March 1995) |

### 3.4. Summary Matrix of Legislation, Policy and Guidelines for Water Management

*Table 5: Summary Matrix of Legislation, Policy and Guidelines for Water Management*

| Legislation, Policy or Guideline | Requirement |
|---|---|
| *Protection of Environment Operations Act* | Section 120 of POEO Act requires that TAC must not pollute waters |
| *EPL licence 6163* | Details discharge points, concentration limits and monitoring requirements |
| *Development Consent DA 391-80 and DA 4908-90* | Details consent conditions applicable to water management |
| *NSW EPA Use of Effluent by Irrigation* | Guidelines for the management of effluent irrigation areas |
| *ANZECC Guidelines 2000* | Water Quality Trigger values used to interpret monitoring data |
| *NHMRC/NRMMC 2004 Drinking Water Guideline* | Guidelines used to interpret monitoring data |

## 4. Water Supply and Usage

### 4.1. Water Supply and Use

Potable water, recycled process and treated effluent water are used on the TAC site. Potable water enters the plant from two separate Hunter Water mains. One is located adjacent to the Tomago Corrective Services Training Facility and the other at the south of the site located at Gate 15.

Potable water is used in the following plant processes;

- cooling of metal in casthouse processes (a non-contact closed loop recirculating system).
- cooling anodes in the cooling tunnel in the paste plant area (a closed loop recirculating system).
- cooling process gases prior to gas and fume treatment.
- cleaning of plant equipment in dedicated cleaning bays.
- cooling air compressors and cast iron induction furnaces (recirculated systems).
- laboratory purposes.
- drinking, showering and flushing toilets.
- car wash in the car park.

The Tomago Aluminium site typically uses approximately $1m^3$ of potable water per tonne of aluminium produced and the water balance for the site is displayed in **Appendix 1**.

Plant water consumption is monitored on a monthly basis and data recorded in the TAC Environment Data database. During 2019/20 TAC underwent a Water Efficiency Assessment as part of the Hunter Water Large Customer Water Efficiency Program. This saw several additional water savings opportunities realised. The site continues to work with Hunter Water on both this and other longer term opportunities such as potable water alternatives.

Annual consumption has dropped from a peak of 1904 kL/day in 2013/2014 to and average of 1387 kL/day for 2020-2023. The graph below displays monthly potable water consumption from 2020.

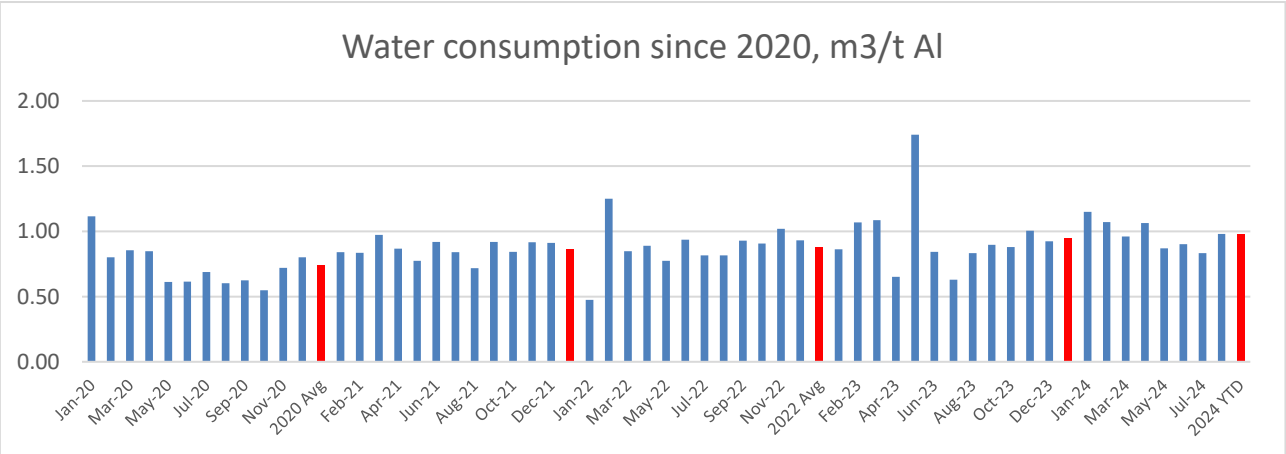


Table 6 below shows the typical breakdown of the main water consuming processes for the smelter.

*Table 6: Site Water Consumption*

| Location | Percentage of site consumption |
|---|---|
| Casthouse (metal cooling) | 58% |
| Compressor Houses (cooling) | 14% |
| Site Amenities | 7% |
| Anode Production (cooling) | 10% |
| Other | 11% |

## 4.2. Fire Systems Supply

The fire water supply feeds through systems mainly located underground with the exception of the supply to Compressor House No 2 and a part of the electrical substation. The fire water distribution system basically shadows aboveground process water supply with the exception of the southwest corner of the plant (Regain and Deline).

## 4.3. Recycling and Reuse of Water and Reduction of Potable Water Usage

### 4.3.1. Recirculated Cooling Systems

The majority of water utilised on-site occurs in closed loop recirculated cooling water systems employed to solidify molten metal in the Casthouse and to cool air compressor systems. Heat from these cooling water systems is extracted via evaporative cooling towers allowing the water to be reused by recirculation.

The water lost by evaporation is replaced by makeup water from the potable water supply.

### 4.3.2. Irrigation System

Sewage effluent is recycled after treatment by the Pasveer system. The decant liquor from the Pasveer channel flows through the maturation

ponds where mixing occurs with casthouse 'blow down' and 'filter backwash' waters. These are the only process waters permitted for recycling in the irrigation system. The waters are then used for site irrigation.

#### 4.3.3. Recycling of Process Water

Process waters from the vehicle wash down area and process water generated in the aluminium casting process are treated by dissolved air flotation plants with the water reused onsite.

#### 4.3.4 Recycling of stormwater

Approximately 20-30 kL per day of stormwater (when available) is directed to the Bake Ovens Fume Treatment Centre cooling towers.

### 4.4. Current Investigations to Reduce Water Consumption

In 2017 investigations commenced into treating stormwater so that it could be used as raw feed water in the Casthouse metal cooling system. The investigations focused on using Reverse Osmosis to treat the stormwater to a quality that would allow for the treated stormwater to be used in the Casthouse cooling system. Due to the disposal issues associated with the reject brine stream generated from the Reverse Osmosis process the project was not viable.

In 2018 dialogue recommenced with Hunter Water regarding investigating options for the use of alternative water sources to reduce potable water consumption. This work is ongoing.

In 2019 there was a campaign in line with the Hunter Water Level 1 and 2 water restrictions via a Water Efficiency Management Plan. Projects completed in line with this plan included:

- reuse of stormwater in the Bake Ovens Fume Treatment Centre cooling towers
- lowering the toilet flush volumes
- Leaking taps etc fixed on a site-wide campaign
- An education and awareness program to site
- Increased capacity in the recycled water system at the steam clean bay
- Reduction of car wash timer

# 5. Stormwater Management

## 5.1. Stormwater System Design

Stormwater runoff is directed via a system of collection sumps and three main underground drainage culverts to a separate collection pond, which consists of a concrete lined sedimentation basin which has the capacity of approximately 12,000 $m^3$. The sedimentation pond is connected to a holding pond, this pond has a surface area of approximately 22,000$m^2$ and a design volume of 17,400$m^3$. The pond design volume is calculated to manage the first flush from 15 mm of rain across the site and the pipe network is designed to manage a 1 in 10-year storm.

A smaller surge basin serving Potline No 3 is situated on the northern side of the smelter. It has a capacity of 7000$m^3$. A 900 mm pipe connects this retention basin to the main drainage culvert. A control valve/sluice gate has been installed to regulate flow into the main drainage culvert, during high intensity storm events. During intense rainfall events the sluice gate is automatically closed due to high water levels detected in the drainage network, stormwater from the Potline 3 area is then collected in the northern surge basin and once the rain intensity decreases and the main drainage culvert has capacity, the sluicing gate opens allowing water to discharge from the surge basin. A surge basin is also situated on the east of the site. The overview of the stormwater collection network is displayed in **Figure 1** below.

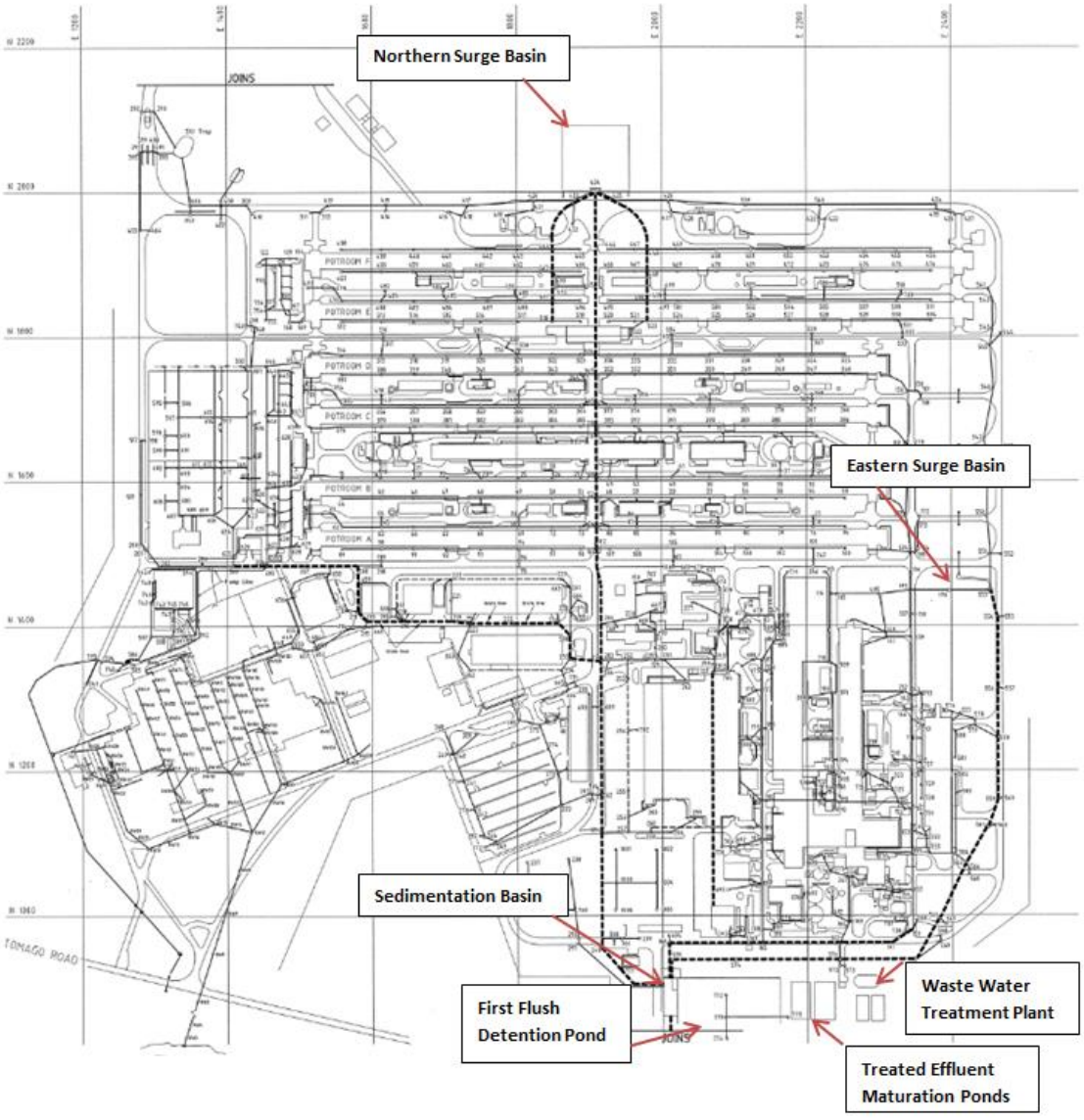



*Figure 1: Overview of the stormwater collection network*

The underground drainage culverts entering the pond, stormwater pond overflow and outfall pipeline to the Hunter River have been designed for a flow equivalent of a 1 in 10 year storm event for the site. Additional details on the stormwater drain layouts can be accessed via Tchest (drawing number 010C05-019).

**Figure 2** below shows the design of the sedimentation basin, first flush retention pond and discharge points for the Tomago Aluminium smelter site.


*Figure 2: Stormwater Sedimentation Basin and First Flush Pond*

The stormwater retention pond and sedimentation basin provides the site with capacity to retain stormwater and manage sediment loads. The stormwater retention pond is managed when possible to allow first flush stormwater to be captured and subsequently diluted during a rain event. This is achieved by the controlled discharge of stormwater retention pond waters during dry conditions. During a rain event, stormwater in excess of the retention pond capacity is discharged directly to the Hunter River via the sedimentation basin “V” notch weir. Rainfall event analysis highlights that on average the number of weir overflow events equates to 2 events per month.

Subsequent stormwater runoff that contains lower fluoride content is discharged directly to the Hunter River. The first flush collection is later discharged at a controlled rate after the quality of the water is verified. This ensures that fluoride levels entering the river are within approved limits. The process of stormwater discharge is controlled in terms of the EPL 6163. Under the licence TAC monitors conductivity, fluoride, total suspended solids and pH during discharge by daily grab sample, and Polyaromatic Hydrocarbons (PAH) and Total Recoverable Hydrocarbons (TRH) once during the discharge.

The discharge procedure for release of stormwater to the Hunter River is detailed in *Discharge Procedures for Stormwater ES.EMS.0019*. Records of monitoring and quantities of stormwater discharged are stored by Environment Services Section with the results reported in the Quarterly and Annual Environment Reports.

Due to the ongoing limited capacity to release stormwater by controlled discharge (and subsequently provide capacity for dilution during rain events), a stormwater treatment system is currently being installed and is due for commissioning in June 2025. This will treat the water to allow for controlled discharge on a continuous basis so that pond capacity can be maintained.

#### 5.1.1. Monitoring of Stormwater

Stormwater quality monitoring is conducted continuously at the two inlets to the sedimentation basin and at the overflow weir. Continuous monitoring data on fluoride and pH are collected and overflow samples are taken from the weir and analysed for metals, cyanide, PAH and TRH. Monitoring is conducted during stormwater discharge at the two EPA licenced discharge points. Details of the monitoring are included in *ES.ESM.0009 Stormwater Monitoring and Routine Maintenance* and *ES.ESM.0019 Discharge Procedures for Stormwater Pond*.

A summary of the onsite stormwater monitoring program is displayed in **Table 7.**

### 5.2. Flood Levels

The original EIS identified that flooding due to a 1 in 50 year flood will be limited to approximately 2.3m AHD on the northern perimeter and 2.7m AHD on the southern boundary and will not encroach on the site. No flooding has occurred on the site.

*Table 7: Summary of Onsite Stormwater Monitoring Program*

| Sample location | Description | Pollutant | Frequency | Analysis Method | Monitoring Body |
|---|---|---|---|---|---|
| Inlet streams to Sedimentation Basin | Monitoring at the two inlet drains to the sedimentation basin | Fluoride | Continuous | In- line instrumentation | Tomago Aluminium Environment Team |
| | | pH | Continuous | In-line instrumentation | |
| Outflow point at weir (EPA Licence Point 35) | Monitoring at the v-notch outlet | Fluoride | Continuous | In- line instrumentation | Tomago Aluminium Environment Team |
| | | pH | Continuous | In-line instrumentation | Tomago Aluminium Environment Team |
| | | Dissolved Metals (Fe, Ag, Al, As Be, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Tl, Zn, Hg) | Each overflow event | Eurofins method LTM-met-3040 | Eurofins |
| | | Free Cyanide | Each overflow event | Eurofins method LTM-INO-4020 | Eurofins |
| | | Conductivity | Each overflow event | LMM-0124 | Tomago Aluminium Laboratory |
| | | TRH & PAH | Each overflow event | LTM-ORG-2010 LTM-ORG-2130 | Eurofins |
| Controlled Discharge point (EPA licence Point 16) | Monitoring before and during controlled discharge events | Fluoride Suspended Solids Conductivity pH | Daily during any discharge | LMM-0116 LMM-0043 LMM-0124 LMM-0121 | Tomago Aluminium Laboratory |
| | | TRH and PAH | Each overflow event | LTM-ORG-2010 LTM-ORG-2130 | Eurofins |

## 6. Wastewater Management

All sewage water from the site is collected via an underground sewage network and treated in the on-site Pasveer Sewage Treatment Plant. The Pasveer channel is an activated sludge system that aerates the material and allows aerobic microbes to breakdown solid matter. The clear supernatant liquor is decanted via two maturation ponds for final treatment before being used as irrigation water.

### 6.1. Sewage Treatment Plant Monitoring

The operation of the sewage and irrigation system is monitored as part of the Environment Services monitoring program according to the method *ES.ESM.0021*. *Sewage Treatment Sample Collection, Data Collection and Routine Maintenance.* Inspections and monitoring of the sewage treatment processes is completed 3 times per week to ensure that the process is functioning at its optimum. The inspection program involves visual inspection of key system components and sampling and analysis for key indicators to verify that the system is operating as designed.

A detailed plan of the sewage plant as well as a layout of the Sewage / Irrigation System is found in Tchest (drawing number 010C05-111).

### 6.2. Treated Effluent and Irrigation Utilisation Area Monitoring

The treated effluent is monitored weekly for pH, conductivity, fluoride and E-coli. Quarterly monitoring assesses biological oxygen demand and suspended solids. The volume of water irrigated is metered to allow assessment against condition L4.1 in Environment Protection Licence 6163 that allows for 30mm per week to be applied to the irrigation utilisation area. Typically 20-25 mm per week is applied to the irrigation utilisation area. The monitoring program samples groundwater around the Sewage Treatment Plant and the Irrigation Utilisation Area. Soil samples are also taken from the Irrigation Utilisation area with results compared to the Department of Environment and Conservation NSW Use of Effluent by Irrigation 2004 Environment Guidelines. A comprehensive On-Site Irrigation Plan was completed by an independent consultant in 2023. An excerpt from the conclusion of this plan:

*The on-site wastewater treatment and irrigation system is generally operating within its original design intent, and consistent with the requirements stipulated in the EPL. The wastewater system is operated in a competent manner as part of the TAC Environmental Management System*.

A summary of the monitoring undertaken on the Sewage Treatment Plant and Treated Effluent is displayed in **Table 8.**

*Table 8: Summary of Sewage Treatment Plant and Treated Effluent Monitoring*

| Sample location | Description | Parameter | Frequency | Analysis Method | Monitoring Body |
|---|---|---|---|---|---|
| Aeration channel of Pasveer Sewage System | Monitoring of sewage treatment parameters to verify system performance | Settleable solids<br>pH<br>Dissolved Oxygen<br>Temperature<br>colour and condition of channel contents | 3 times per week | ES.ESM.0021 | Tomago Aluminium Environment Team / Laboratory |
| | | Mixed liquor Suspended Solids<br>Ammonia<br>Nitrate | Weekly | | |
| | | Volatile Suspended Solids | Monthly | LMM-0043 | |
| | | BOD | Quarterly | LMM-0132 | Tomago Aluminium Laboratory |
| Treated Effluent | Monitoring of treated effluent at second Maturation Pond prior to irrigation | pH<br>Conductivity<br>Fluoride<br>E-Coli | Weekly | LMM-0121<br>LMM-0124<br>LMM-0116<br>LMM-0088 | Tomago Aluminium Laboratory |
| | | BOD<br>Suspended Solids | Quarterly | LMM-0132<br>LMM-0043 | Tomago Aluminium Laboratory |
| Irrigation Utilisation Area | Monitoring of Volume irrigated | Volume irrigated | Weekly | ES.ESM.0021 | Tomago Aluminium Environment Team |
| | Groundwater Monitoring | E-Coli | Yearly | ES.ESM.0021 | Tomago Aluminium Laboratory |
| | | Total Nitrogen<br>Total Nitrate<br>Total Phosphorus<br>Orthophosphate<br>Metals<br>Sodium Absorption Ratio | 5 yearly | | External NATA accredited Laboratory |
| | Soil Profile Monitoring | pH,<br>Conductivity,<br>Nitrate,<br>Total Nitrogen<br>Available Phosphorus<br>Total Phosphorus<br>Metals | | | External NATA accredited Laboratory |

## 7. Cooling Tower Management

The cooling towers are registered with Port Stephens Council and are regularly monitored and serviced by a contract supplier to ensure high water quality is maintained. Regular biological monitoring for Legionella bacteria is conducted as part of the Occupational Hygiene monitoring program according to *Legionella Management Systems OHS.OP.4.7.1.15*.

## 8. Contaminated Process Waters

Where process or wastewaters require removal from site, the task is performed by a professional waste disposal company and the amounts removed are tracked and documented by the Waste Co-ordinator. Details of the waste tracking process are described in *Waste Disposal Procedure PW.EMS.0007*.

## 9. Off-Site Surface Water Monitoring

The current EPL 6163 (condition M5.6) requires TAC to monitor the fluoride, pH and conductivity levels of surface waters within 16.5km of the smelter. A map of the surface water monitoring sites is presented in **Figure 3** below. Twelve sites are regularly monitored in accordance with *ES.ESM.0008 Water Sampling*. If the monitoring sites are on private land or owned by Hunter Water, approval to access the site is required. The record of Hunter Water approval is included in **Appendix 2**.

The monitoring sites vary from natural water courses to farm dams and livestock water points.

Sites 1,2,3,4 and 11 are ephemeral swamps with fluoride concentrations influenced by rainfall. Site 1 is located just north of the smelter and displays the highest fluoride concentrations with annual results of around 5 – 10 mg/L.

Sites 5 & 6 are Hunter River sites and due to the tidal nature of the river have naturally elevated fluoride concentrations due to the sea water influence. Annual results of 1-1.5 mg/L are typical.

Site 17 is at Grahamstown Reservoir with typical annual concentrations below 0.5 mg/L.

Sites 34 and 178 are livestock watering points (potable water) with typical concentrations below 1 mg/L.

The results are available at the end of each month and are reported quarterly in the Environment Report which is provided to the Environment Protection Authority and Hunter Water.

## 9.1. Monitoring of the Hunter River

A monitoring program was developed by Tomago Aluminium Company in consultation with NSW Fisheries to meet the approval conditions for the expansion of Tomago Aluminium smelter.

The impact of stormwater discharge on the Hunter River is monitored approximately 500m upstream and 500m downstream of the stormwater outlet from the Tomago site. This monitoring is performed as part of the Environment Services monitoring program according to method *Water Sampling ES.ESM.0008* and *Hunter River, Oyster and Sediment Sampling ES.ESM.0016*.

The monitoring program includes quarterly sampling of sediments. Oysters were sampled by the methodology proposed in 1995 by Tomago Aluminium and accepted by the NSW Fisheries.

Following the cessation of Oyster Farming in the Fern Bay / Fullerton Cove area in 2011, the program was modified to sampling naturally occurring oysters annually from the riverbank. Large fresh water events in 2021-22 has seen the demise of the natural oysters so TAC is currently in discussions with NSW Fisheries on the future of this program. Records of correspondence sent to NSW Fisheries is included in Appendix 4.

The samples are analysed for a range of heavy metals and fluoride. **Table 9** displays the monitoring undertaken in the Hunter River near the discharge point. The results are reviewed annually to determine if further action is required.

Mean fluoride and metals concentrations in sediments in the Hunter River are generally higher at the downstream and outlet locations compared with the upstream location. However, when considering the variability of the data, the concentrations in sediments are not likely to be statistically higher at these locations. For fluoride concentrations in water, concentrations at both upstream and downstream sites are within fluoride concentrations known to occur in seawater (<1.4mg/L). Influences on these include inter-annual differences such as rainfall, volumes of discharge and flow conditions.

*Table 9: Summary of Monitoring for surface water and the Hunter River near the Discharge Point*

| Sample location | Sample | Analyte | Frequency | Monitoring Body |
|---|---|---|---|---|
| Site 1, 2, 3, 4, 5, 6, 7, 9, 11, 34, 178 | Water | pH<br>Fluoride<br>Conductivity | Monthly | Tomago Aluminium Laboratory |
| Site 17 | Water | pH<br>Fluoride<br>Conductivity | Quarterly | Tomago Aluminium Laboratory |
| 500 metres upstream of stormwater discharge point | Sediment | Metals (Sb, Ag, As, Cd, Cr, Cu, Pb, Ni, Zn, Hg)<br>Fluoride | Quarterly | External NATA accredited Laboratory<br>Tomago Aluminium Laboratory |
| | Oyster* | Metals (Al, As, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, Zn, Hg)<br>Fluoride | Annually | External NATA accredited Laboratory<br>Tomago Aluminium Laboratory |
| | Water | Dissolved Metals (Ag, Al, As, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Sb, Se, Tl, Zn, Hg) | Quarterly | External NATA accredited Laboratory |
| 500 metres downstream of stormwater discharge point | Sediment | Metals (Sb, Ag, As, Cd, Cr, Cu, Pb, Ni, Zn, Hg)<br>Fluoride | Quarterly | External NATA accredited Laboratory<br>Tomago Aluminium Laboratory |
| | Oyster* | Metals (Al, As, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, Zn, Hg)<br>Fluoride | Annually | External NATA accredited Laboratory<br>Tomago Aluminium Laboratory |
| | Water | Dissolved Metals (Ag, Al, As, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Sb, Se, Tl, Zn, Hg) | Quarterly | External NATA accredited Laboratory |
| Discharge Point | Sediment | Metals (Sb, Ag, As, Cd, Cr, Cu, Pb, Ni, Zn, Hg)<br>Fluoride | Quarterly | External NATA accredited Laboratory<br>Tomago Aluminium Laboratory |
| | Oyster* | Metals (Al, As, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, Zn, Hg)<br>Fluoride | Annually | External NATA accredited Laboratory<br>Tomago Aluminium Laboratory |
| | Water | Dissolved Metals (Ag, Al, As, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Sb, Se, Tl, Zn, Hg) | Quarterly | External NATA accredited Laboratory |

*Currently on hold due to lack of oysters available


*Figure 3: Tomago Aluminium Surface Water Monitoring Sites*

## 10. Groundwater Management

The Tomago Aluminium Smelter is located on the edge of the Tomago Sandbeds. The Tomago Sandbeds geology is controlled by the underlying Medowie Clay Member Aquitard. The average aquifer thickness is around 18 metres and consists of unconsolidated sand with semi consolidated coffee rock horizons. The Tomago Sandbeds has a water divide which is located through the middle of the sand body and is oriented north east to south west from Tomago to Tanilba Bay and Tillegerry Creek.

Groundwater flow at the site, based on measurement experience is assessed to be towards the south and south east towards the Hunter River. A groundwater divide is interpreted to be present near the north western corner of the developed area of the site. Beyond this divide groundwater flow is expected to flow in an approximately north westerly direction towards a reach of the Hunter River upstream from the Hexham Bridge. Pictorial representation of the groundwater flow in the Tomago Sandbeds is displayed in Figure 4.

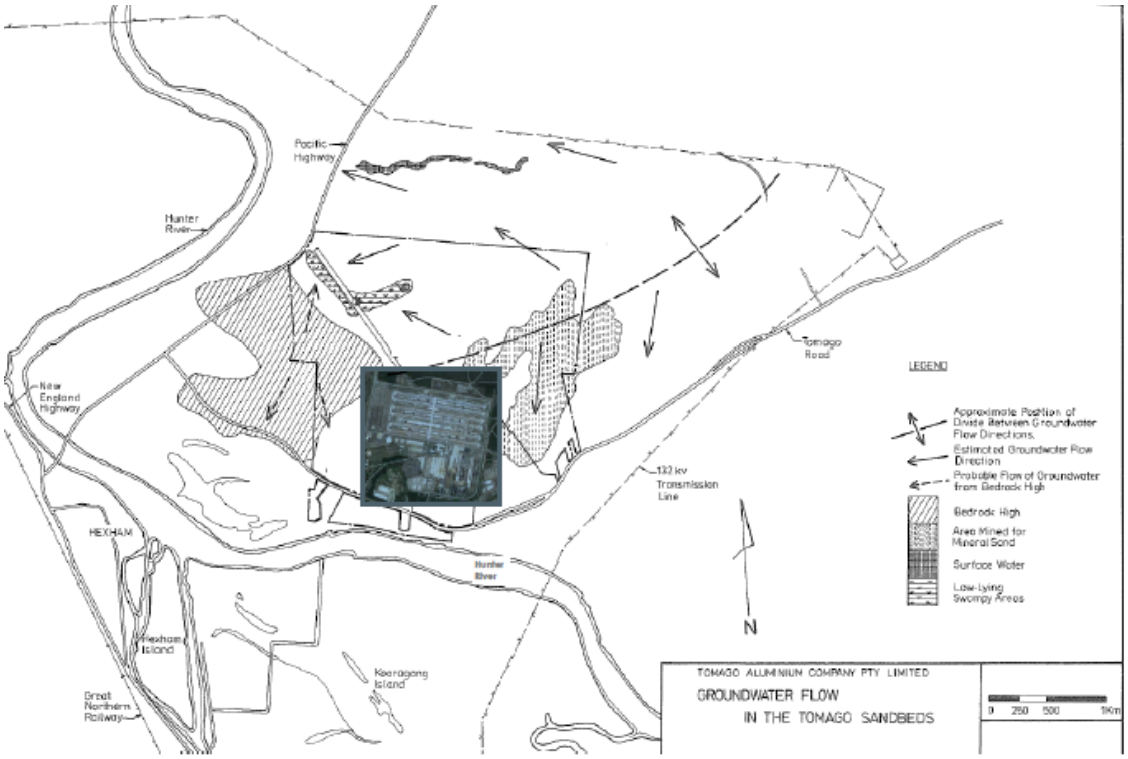



*Figure 4: Groundwater Flow in the Tomago Sandbeds*

The water level within the Tomago Sandbeds Aquifer fluctuates in response to natural variation in rainfall and seasonal climatic changes. Groundwater levels may also be influenced by groundwater extraction. Large scale groundwater extraction occurs to the north east of the site from a network of bores operated by Hunter Water Corporation. Extraction of groundwater at these sites may also influence groundwater levels, however a residual soil/rock ridge isolate the Tomago Aluminium smelter from the northern extraction bores and the eastern bores are probably too remote to be of any consequence.

## 10.1. Groundwater monitoring

The groundwater monitoring program is conducted by Tomago Aluminium in accordance with procedure *ES.ESM.0014 Groundwater Sampling* and assesses groundwater depth, fluoride concentrations, pH and conductivity at sites situated in the Tomago sandbeds and on the smelter site. Bores are sampled on a monthly or quarterly basis to ensure a solid database is available for assessment.

The monitoring bores established in the Tomago sandbeds are displayed in **Figure 5** below. Initial monitoring bores were established in the Nelson Bay – Anna Bay area (site 59, site 60 and site 61). These sites were 15 kms, 16 kms and 21 kms from the TAC site. Given the distance from the smelter and only background fluoride concentrations being detected the program was modified to

current monitoring bores in the Tomago and Williamtown area. The sampling and analysis of these bores is undertaken by Hunter Water.

The monitoring bores established on the Tomago Aluminium site and boundaries are displayed in **Figure 6** below. The sampling and analysis of these bores is conducted by Tomago Aluminium.

Results of the groundwater monitoring are reported in the Quarterly and Annual Environment Reports.


*Figure 5: Groundwater Monitoring Bores sampled by Hunter Water*

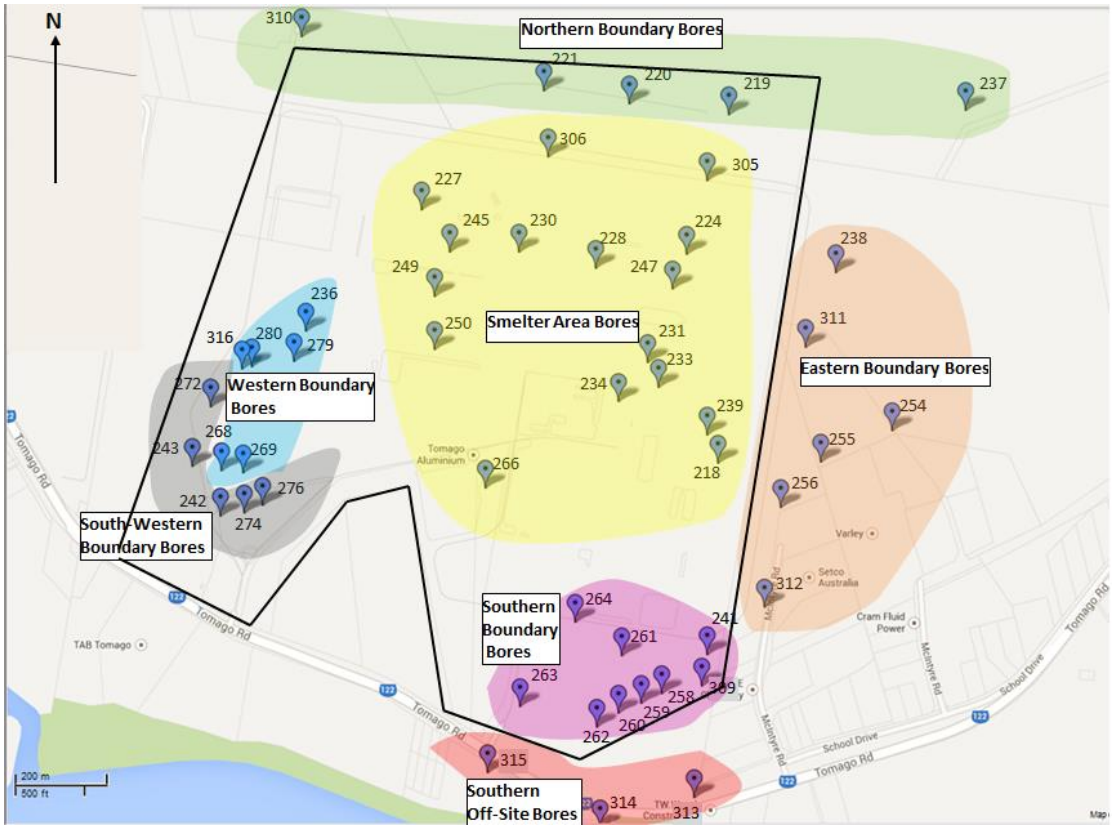



*Figure 6: Groundwater Monitoring Bores sampled by Tomago Aluminium*

## 11. Contingency Measures & Assessment of Impact

Tomago Aluminium has an extensive monitoring program designed to fulfill its EPA licence and development conditions and to allow potential pollutants to be assessed and managed. Results are reviewed by Environment Services staff and anomalous data are referred to the Superintendent - Environment for a decision upon the next course of action**. Table 10** below defines the contingency response plan if water quality parameters indicate contamination impacts.

*Table 10: Contingency Response Plan*

| Surface Water | | | |
|---|---|---|---|
| | Trigger | Action | Response |
| Normal | | | Continue to monitor in accordance with frequency specified in Table 7 |
| Stage 1 | Upward trend in any of the water quality parameters listed in Table 8 for three consecutive months | Alert Environment Superintendent | Investigate if change in parameters is due to meteorological conditions, sampling or spill. |
| Stage 2 | Upward trend in any of the water quality parameters listed in Table 8 for six consecutive months | Alert Site Management | Investigate and implement mitigation measures.<br>Notify Landowner of investigation |
| **Ground Water: Tomago Sandbeds** | | | |
| | Trigger | Action | Response |
| Normal | | | Continue to monitor in accordance with specified frequency |
| Stage 1 | Groundwater Bores monitored in Tomago Sandbeds are above background concentrations | Alert Environment Superintendent | Investigate sampling and analysis to confirm result.<br>Instigate resampling of the bore.<br>Investigate if change is due to any spill, seepage or leachate |
| | Upward trend in water quality parameters for 3 consecutive months | Alert TAC Site Management | Notify Hunter Water.<br>Investigate if change in groundwater concentrations is due to any spill, seepage or leachate.<br>Install additional monitoring points if requested by HWC<br>Engage groundwater specialist |
| Stage 2 | Upward trend in any of the water quality parameters for six consecutive months | Alert Site Management | Investigate and implement mitigation measures. |
| **Ground Water: Tomago Aluminium Site** | | | |
| | Trigger | Action | Response |
| Normal | | | Continue to monitor in accordance with specified frequency |
| Stage 1 | Groundwater Bores monitored on Tomago Site display an upward trend of water quality parameters for 3 consecutive months | Alert Environment Superintendent | Investigate if change is due to any spill, seepage or leachate |
| | Upward trend in any of the water quality parameters for 6 consecutive months | Alert TAC Site Management | Investigate if change in groundwater concentrations is due to any spill, seepage or leachate.<br>Engage groundwater specialist and investigate the extent of the contamination plume.<br>Implement actions to address source of contamination. |
| Stage 2 | Upward trend in any of the water quality parameters for nine consecutive months | Alert Site Management | Investigate and implement mitigation measures.<br>Notify Regulatory Agencies |

## 12. Notification, Reporting & Documentation

All spills or other incidents impacting negatively on the quality of stormwater, groundwater or local surface waters and abnormal monitoring results are to be reported using the TAC Incident Reporting System. Where a spill has occurred the *Spill Containment & Response Program ES.EMS.0006* protocol shall be followed.

TAC is required under Condition 12 (DA 4908-90) to inform Hunter Water of any incident which may affect Hunter Water's water supply, additional detail on this reporting requirement is included in *ES.EMS.0014 Environmental Reporting Program.*

Any complaints received are to be reported using the TAC Incident reporting system and managed in accordance with TAC procedure *ES.EMS.0013 Complaint Handling Procedure.*

Environmental personnel will review incident reports and monitoring results. The Occupational Hygienist shall review the Legionella monitoring results and recommend control procedures. Decisions on the escalation of reporting will be determined in accordance with the *ES.EMS.0014 Environmental Reporting Program*.

Environmental monitoring results are reported on a quarterly and annual basis to key stakeholders, which include EPA, Hunter Water, Department of Planning and Port Stephens Council.

## 13. Roles & Responsibilities

TAC Management is committed to the success of the Water Management Program. Commitment is evident through active involvement of management personnel and by providing the necessary resources. In addition, management and individuals are held accountable for the successful implementation of this program. Key personnel and responsibilities for the execution of the Water Management Program are defined below:

*Table 11: Roles & Responsibilities*

| Responsibilities | CEO | SHE Manager | Superintendent Environment | Managers, Superintendents, Supervisors | Employees and Contractors |
|---|---|---|---|---|---|
| Ensure that a Water Management Program is established and maintained that meets all applicable legal requirements | X | | | | |
| Co-ordination of the program's implementation, maintenance, auditing and review | | X | | | |
| Ensuring activities in their respective area of control are conducted in a manner to minimise negative impacts on the stormwater, groundwater and effluent. | | | | X | |
| Ensure that employees & contractors under their control meet the Water Management Program obligations. | | | | X | |
| Monitor hazardous chemical storage and transfer locations within their area | | | | X | |
| Immediately report any spill or potential spill condition and comply with TAC's Spill Control & Response Program (Spill Containment ES.EMS.0006) | | | | X | X |
| Monitor waters on site for assessment of management program effectiveness. | | | X | | |
| Monitor Groundwater for likely contaminants. | | | X | | |
| Monitor surface waters near the smelter to assess impact | | | X | | |
| Monitor the treated effluent waters for likely contaminants. | | | X | | |
| Ensuring the operation of the sewage system is at an acceptable level. | | | X | | |
| Ensuring the operation of the irrigation system. | | | X | | |
| Correct discharge procedures followed for discharge of stormwater to the Hunter River. | | | X | | |
| Reporting of monitoring data, licence breaches or major spills to the EPA. | | X | X | | |

## 14. Raw Materials, Chemicals Used and Stored On Site

Stormwater quality can be impacted by atmospheric deposition, spillage of aluminium smelter products during transport and transfer operations.

The primary significant contaminant is fluoride and the range of smelting products conveyed and transported across the site are:

1. Fresh alumina: alumina is one of the main raw materials required in the smelting of aluminium. The fresh alumina is fed into the smelter's Gas and Fume Treatment Centres and when enriched with fluoride this alumina becomes the feed to the electrolytic cells that produce the aluminium.
2. Aluminium Fluoride: this material is used to maintain the fluoride concentrations in the electrolytic cells to ensure the cells are operating with a chemistry that will optimise aluminium production.
3. Petroleum Coke: Calcined Petroleum Coke is the main raw material used in the production of the carbon anode that is consumed in the production of aluminium.
4. Fluoridated alumina: This material is the fluoride enriched alumina produced after the dry scrubbing of emissions that are generated in the electrolytic cells. The fluoridated alumina typically has fluoride concentrations of 1.8 % and is used as the alumina feed to the electrolytic cells.
5. Charged alumina: this material is the fluoride enriched alumina produced from the dry scrubbing of emissions generated from the baking of the carbon anodes. The charged alumina typically has fluoride concentrations of 1 %. The charged alumina is distributed with the fluoridated alumina and used as alumina feed to the electrolytic cells.
6. Electrolytic Bath: this material is a mixture of alumina and cryolite (sodium aluminium fluoride) and is used in the electrolytic cell in a molten form to dissolve the alumina and in a solid form as a cover on the anodes to reduced air burn of the anodes and heat loss from the cell.
7. Green Scrap: this material can be generated from the production of the anodes in the Paste Plants. It will typically be a mixture of petroleum coke and pitch and is recycled into anode manufacture.
8. Baked Scrap: this material is generated from the reprocessing of the spent anode butts. Baked scrap is recycled back into the process by being added to the formulation for the production of the anodes.
9. Aluminium Dross: this material is produced from the reaction of the molten aluminium with air. The dross is skimmed from the casthouse furnaces prior to casting and rapidly cooled. The dross has an amount of metallic aluminium and undergoes further processing by a third party to recover the aluminium.

10. Spent Potlining (SPL) first cut: is the carbon cathode layer that is generated when the electrolytic cell reaches end of life.
11. Spent Potlining (SPL) second cut: is the refractory based insulation layer that is generated when the electrolytic cell reaches end of life.

In addition diesel and oil based lubricants are used in the Production areas of the Smelter. Detail of dangerous goods storage and tank management is detailed in *ES.EMS.0006 Spill Containment and Response Program.*

## 15. Standards to Minimise Potential Impact

To reduce the potential impact of chemicals, raw materials and waste used on the site, standards have been established for:

- Bunding and spill response as detailed in the *Spill Containment and Response Program ES.EMS.0006.*
- Housekeeping and materials management in key production areas. Regular inspections are conducted within business units. Production and waste materials that have the potential to leach contaminants require appropriate management and clean up.
- Regular scheduled sweeping of Roadways and material transfer points.
- Waste materials generated on the site are segregated and stored in designated hazardous waste storage facilities. Details of waste storage and handling requirements, including routine inspections of hazardous waste storage facilities, are described in the *Waste Management Program ES.EMS.0007*.
- Washdown of equipment, vehicles and tools must only occur in designated washdown bays. Washdown in other areas may lead to washwater entering and contaminating the stormwater system.
- Dedicated bunded storage areas for chemical and lubricants.
- All diesel/ fuel storage in above ground double skin tanks with leak detection alarms.

The ultimate aim of this program is to protect the environment by minimising the impact of the activities of Tomago Aluminium on the quality of the water on and adjacent to the site.

## 16. Training

All employees and contractual employees will receive Environmental Awareness training at time of hire or induction.

All employees working on equipment, processes or within functions with potential for adversely affecting the quality of stormwater, groundwater or surface waters on the site or the environment surrounding the site are trained such that they understand the nature of the risk and their role in preventing any adverse condition from occurring.

Specific training on spill response is given to those employees that have added responsibilities.

All training records are maintained in the Human Resources Management System (Success Factors).

All training will be planned and managed in accordance with *Training Awareness and Competency Procedure HSE.MP.016.*

## 17. Contractors & Visitors

TAC employees responsible for bringing contractors or visitors on site must ensure that the individual(s) adheres to TAC's Water Management Program.

## 18. Communications

The Water Management Program is modified as required to reflect changes in regulatory requirements, processes, procedures, site conditions, or in response to recommended changes to facilitate continuous improvement. These changes are managed in conformance with *Plantwide Document Control Procedure PW DOC.0001.*

As this document is required to be approved by the Department of Planning, Infrastructure and Environment, subsequent revisions are required to be submitted for approval.

Changes to the Water Management procedures are communicated in conformance with: *Communication Procedure HSE.MP.016*.

## 19. Compliance / Auditing

Changes to relevant water management process regulations and other commitments are assessed, analysed and tracked in accordance with the procedure *HSE Legal & Other Requirements Procedure HSE.MP.004*.

At TAC, various mechanisms are employed to ensure compliance, including

- TAC internal EHS audits
- Line personnel conduct routine inspections (e.g. Housekeeping and Orderliness inspections) to assess compliance; and

- Line personnel observe employees to assess compliance, and provide informal and formal feedback as necessary.
- External audits

## 20. Program Evaluation & Management Review

As part of the established Environment management document review process, TAC conducts a review of this program periodically to:

- Ensure that it reflects the current site conditions and response procedures;
- Identify gaps in the process; and
- Serve as a planning tool for continual improvement.

The review addresses:

- Regulatory requirements;
- Roles & responsibilities
- Management procedures;
- Training; and
- Communications.

In addition the program is reviewed and modified whenever a change to process, procedures and/or site conditions warrant, and within three months of the site's Independent Environment Audit which is conducted every three years.

## 21. References

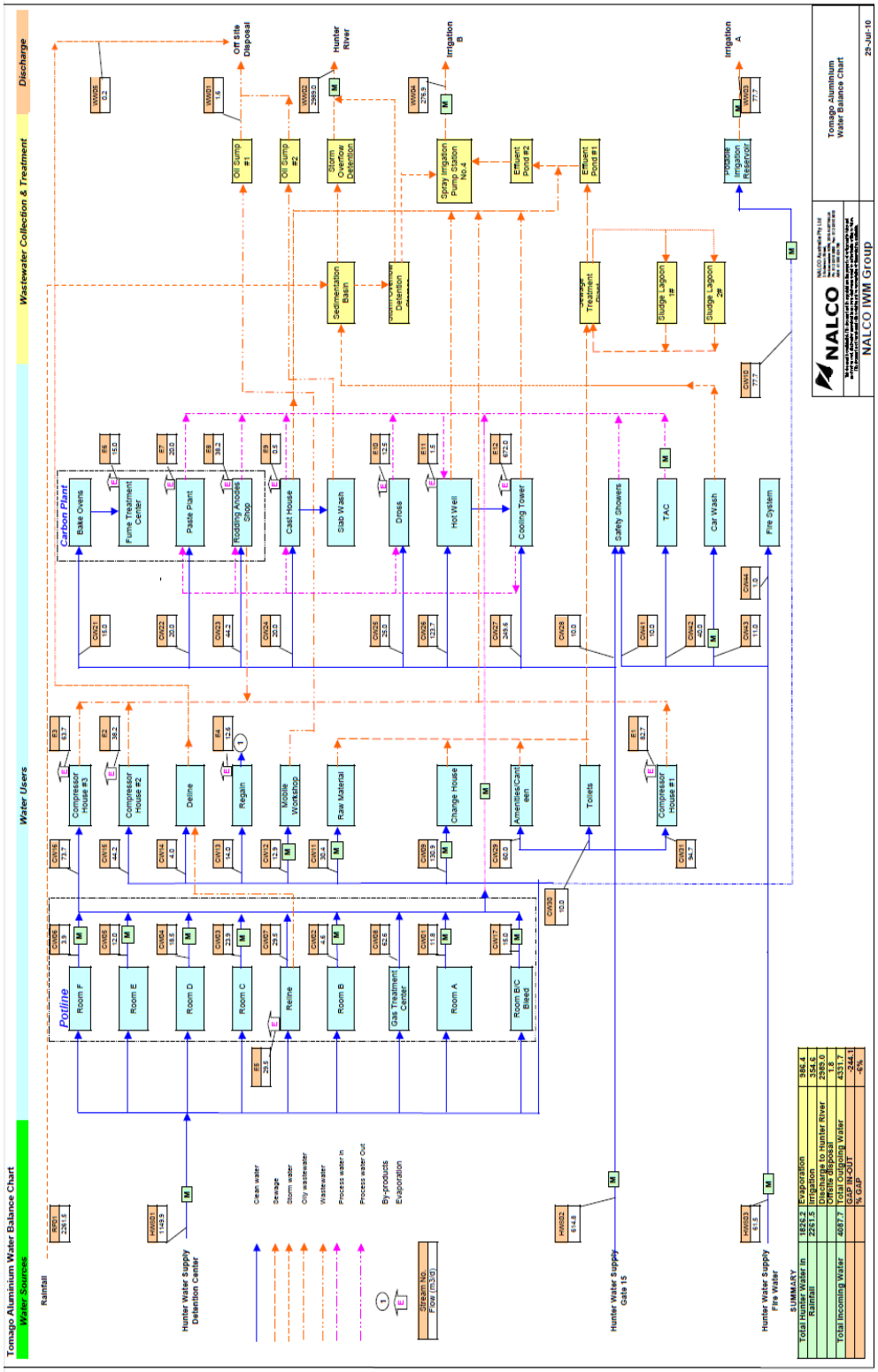
*Table 12: References*

| Reference Document | Precis of Document |
|---|---|
| ES.EMS.0019<br>Discharge Procedures for Stormwater | This procedure describes process for the intentional release of contained stormwater during dry conditions such that operational and environmental requirements for the discharge of collected stormwater to the Hunter River is in accordance with EPA licence conditions. The discharge point is referred to as Point 16 in EPA Licence 6163. |
| PW.EMS.0007<br>Waste Disposal Procedure | This procedure summarises the required process for the disposal of wastes generated at the Tomago Aluminium Company (TAC) site**.** It describes the processes of new waste assessment and classification, storage and handling of waste products at the Tomago site, transport off-site & the recycling, treatment and/or disposal of wastes off-site. |

| Reference Document | Precis of Document |
|---|---|
| ES.EMS.0014<br>Environmental Reporting Program | This document summarises the environmental reporting requirements of Tomago Aluminium to ensure compliance with development consent conditions, Licence conditions under the Protection of the Environment Operations Act and reporting requirements under other relevant environmental based legislation. It also ensures environmental incidents on site are reported, investigated and corrective actions taken when required. |
| ES.ESM.0014<br>Groundwater Sampling | This method describes the procedure for the collection of Groundwater samples. |
| OHS.OP.4.7.1.15<br>Legionella Management Systems | The purpose of this document is to define roles and responsibilities and describe the functions and activities in applying *Tomago Aluminium Company Legionella Management Systems.* This system applies to all water systems on site. |
| ES.ESM.0016<br>Hunter River, Oyster and Sediment Sampling | This method describes the procedures required to collect water, oyster and sediment samples from the Hunter River system. The samples are collected in accordance with requirements of approval conditions for the 1992 potline expansion. |
| PW.DOC.0001<br>Plantwide Document Control Procedure | This procedure defines the system for document management at Tomago Aluminium Company (TAC) and applies to all documents required by the TAC Management System. |
| ES.ESM.0021<br>Sewage Treatment Sample Collection, Data Collection and Routine Maintenance | This method describes the sampling and maintenance schedule necessary to ensure that the Company's Sewerage Treatment Works operates effectively and releases a high quality effluent for recycling as irrigation water. |
| *HSE.MP.004*<br>*Legal & Other*<br>*Requirements Procedure* | This procedure defines the methodology used to identify, access and update TAC's Environmental and WHS legal and other requirements and the communication of these requirements to the workforce. This procedure also addresses how TAC will assess compliance to identified legal and other requirements |
| ES.EMS.0003<br>Wallaroo Landfill Management Plan | This management plan details information on the operation of the Wallaroo Landfill Facility owned by Tomago Aluminium Company Pty Limited. This facility is no longer in use and there are no plans to use it to receive landfill. The site currently operates in accordance with the Protection of the Environment Operations Act (Licence number 6048). |
| ES.EMS.0006<br>Spill Containment & Response Program | This program addresses the management of accidental or unintentional environmental releases (i.e. spill) to water, soil or air at TAC. Intentional releases to air and water as well the management of greenhouse gases and waste are covered in separate programs. |
| ES.ESM 0009<br>Stormwater Monitoring and Routine Maintenance | This method outlines the procedures for the monitoring of stormwater collected from around the smelter, before discharge into the Hunter River as well as maintenance of monitoring equipment. |
| ES.EMS.0041<br>Water Balance Chart | This document provides detail on the water use and disposal for the TAC site. |

| Reference Document | Precis of Document |
|---|---|
| ES.ESM.0008<br>Water Sampling | This method outlines procedures to obtain a representative sample from various surface water bodies and handle the sample in such a way that the parameters of interest do not deteriorate.<br>This method is applicable to the sampling of water from any body of surface water. This method also describes the correct methods of preservation of samples. The parameters of interest include fluoride, cyanide, pH and conductivity. Preservation for other parameters if required is contained in the references. |

# Appendix 1 - Water Balance Tomago Aluminium Company



## Appendix 2 - Authority to access Hunter Water Land

HUNTER WATER

caring for our community and the environment



Enquiries: R Gumb
Phone: (02) 4979 9433
Facsimile: 02-4927 0157
e-mail: bob.gumb@hunterwater.com.au

10 March 2005

Mr N Roser
Environmental Services Team Leader
Tomago Aluminium Company
PO Box 505
RAYMOND TERRACE NSW 2324

Dear Sir

Thank you for your letter of 2 February 2005 regarding access to Tomago Sandbeds for the purposes of monthly sampling of surface water.

Subject to you accepting the following conditions, an Authority to Enter will be issued permitting your entry onto Hunter Water Corporation land for an approved period. Please sign and return this letter and I will arrange for a permit to be issued and forwarded to you.

The conditions under which a permit will be issued are:

1. That you enter the land at your own risk and indemnify Hunter Water Corporation (HWC) against all claims and actions arising out of your entry upon and use of the land and that you indemnify HWC against any damage or injury to its property or personnel arising from your entry upon and use of the land.
2. That you accept responsibility for all parties involved in your activities including but not limited to employees, consultants, contractors, invitees and other interested persons.
3. That you exercise proper precautions to prevent any damage whatsoever to HWC property or facilities on the land. You will not obstruct or hinder HWC or any other authorised party from undertaking work on the land.
4. Access to and across the land will be confined to recognised access roads, tracks and firebreaks.
5. No waste, litter or other substance will be brought onto or left on the land.
6. No plant, shrub, tree or other vegetation will be disturbed, damaged or removed from the land.
7. You must notify the Corporation's Ranger Mr Ian Graham on phone number 49 799 847 or mobile 0419 604 895 at least 24 hours prior to entering the land to confirm your entry and use arrangements.
8. The land is within a Special Area under the Hunter Water (Special Areas) Regulations 2003. The objectives of the Regulations are to protect the quality and quantity of water in the Special Area for the supply of potable water to the Lower Hunter Region. Special Areas Regulations must be observed at all times.
9. Any instruction or direction given by a HWC Ranger or any other authorised officer will be observed and complied with.

10. The Authority to Enter does not extend to other lands owned by HWC and access [illegible] lands is not permitted under the Authority to Enter.
11. HWC reserves the right to suspend entry onto the land at any time and without notice in the event of urgent works being required or if your activities are deemed to be causing an adverse impact on HWC land or operations or infrastructure.
12. The Authority to Enter may be withdrawn by the HWC at any time without notice.
13. The Authority to Enter is valid only for the approved period.
14. Access into areas where RZM Pty Ltd have mining and rehabilitation works is not permitted without the express approval of RZM Pty Ltd.
15. Tomago Aluminium is to supply to the Corporation a map showing the location of the sampling points and the location of the HWC gates that they access for their routine sampling.
16. Upon a request from the Corporation Tomago will supply to the Corporation a copy of the results from the sampling.

Prior to entering onto the land, you will be required to attend a site induction. Details of the time and location for the induction will be forwarded to you upon return of this letter. Please ensure you allow sufficient time for postage and return of this letter, for the site induction and for the Authority to Enter to be issued. Whilst every effort will be made to meet your timeframe for access to the land, HWC gives no undertaking that an Authority to Enter will be issued by the required date.

If these conditions are acceptable, please sign and return this letter at your earliest convenience to ensure prompt issue of the permit by the required date.

Please contact me if you have any query in this matter.

Yours sincerely

Bob Gumb
Real Estate Drafter
Property Management

I Neil Roser, on behalf of Tomago Aluminium Company Pty limited accept the above terms and conditions.

I can be contacted on telephone no. ....49669322.....

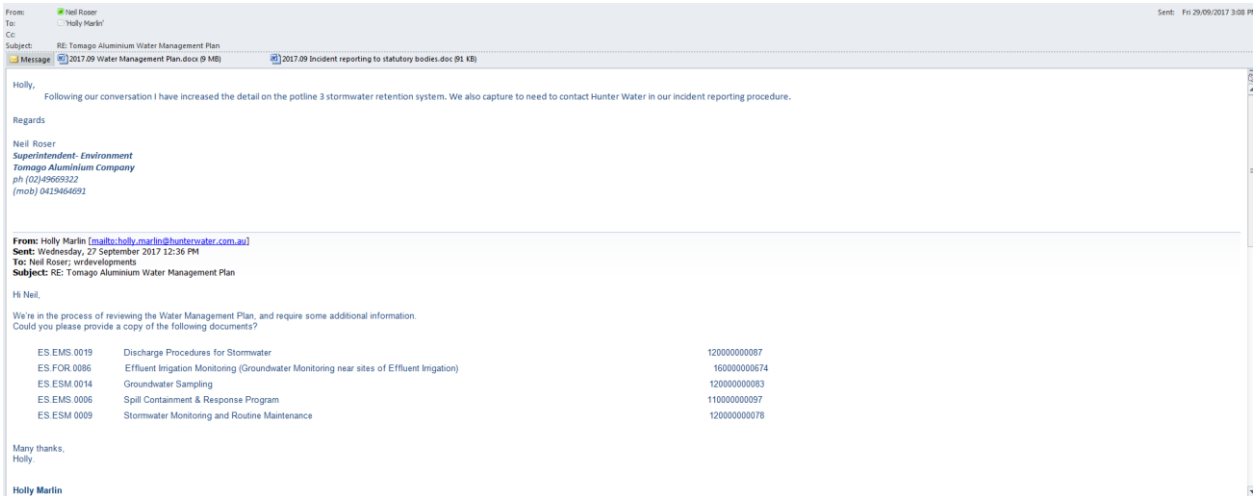
Signature .....N. Roser..... .....

Date .....15/3/05.....

***Please sign and return to:- before the required date.***

***Property Management***
***Hunter Water Corporation***
***PO Box 5171***
***HRMC NSW 2310***

# Appendix 3 - Records of Consultation of Water Management Plan with EPA and Hunter Water



From: Neil Roser
To: 'Holly Marlin'
Cc:
Subject: RE: Tomago Aluminium Water Management Plan
Sent: Fri 29/09/2017 3:08 PM
Message | 2017.09 Water Management Plan.docx (9 MB) | 2017.09 Incident reporting to statutory bodies.doc (91 KB)

Holly,
Following our conversation I have increased the detail on the potline 3 stormwater retention system. We also capture to need to contact Hunter Water in our incident reporting procedure.

Regards

Neil Roser
***Superintendent- Environment***
***Tomago Aluminium Company***
*ph (02)49669322*
*(mob) 0419464691*

**From:** Holly Marlin [mailto:holly.marlin@hunterwater.com.au]
**Sent:** Wednesday, 27 September 2017 12:36 PM
**To:** Neil Roser; wrdevelopments
**Subject:** RE: Tomago Aluminium Water Management Plan

Hi Neil,

We're in the process of reviewing the Water Management Plan, and require some additional information.
Could you please provide a copy of the following documents?

| | | |
|---|---|---|
| ES.EMS.0019 | Discharge Procedures for Stormwater | 120000000087 |
| ES.FOR.0086 | Effluent Irrigation Monitoring (Groundwater Monitoring near sites of Effluent Irrigation) | 160000000674 |
| ES.ESM.0014 | Groundwater Sampling | 120000000083 |
| ES.EMS.0006 | Spill Containment & Response Program | 110000000097 |
| ES.ESM.0009 | Stormwater Monitoring and Routine Maintenance | 120000000078 |

Many thanks,
Holly.

**Holly Marlin**

NSW EPA

DOC17/441634, File No. EF13/3725

Tomago Aluminium Company Pty Limited
PO Box 405
RAYMOND TERRACE NSW 2324

Attention: Mr Neil Roser

Neil.Roser@tomago.com.au

Dear Mr Roser

**ENVIRONMENT PROTECTION LICENCE 6163 – MANAGEMENT PLANS**

Reference is made to your emails to the Environment Protection Authority (EPA) on 28 August 2017 providing updated management plans in respect of Tomago Aluminium. These plans included the:

- Air Emission Release Management Program;
- Water Management Program;
- Flora and Fauna Monitoring & Buffer Zone Management Plan; and
- Waste Management Program.

The EPA encourages the development of such plans to ensure that proponents and licensees have determined how they will meet their statutory obligations and designated environmental objectives.

Being a regulatory authority, the EPA's role is to administer and regulate statutes for environmental management and protection. As such the EPA does not directly get involved in the development of strategies to achieve those objectives and does not review or comment on such plans. Accordingly, the EPA has not reviewed and offers no comments on the above management plans and programs.

If you require any further information regarding this matter, please contact me on (02) 4908 6824.

Yours sincerely

28/8/2017

**HAMISH RUTHERFORD**
**Senior Operations Officer - Hunter**
**Environment Protection Authority**

Contact officer: HAMISH RUTHERFORD
(02) 4908 6824
hunter.region@epa.nsw.gov.au

PO Box 488G Newcastle NSW 2300
117 Bull Street, Newcastle West NSW 2302
Tel: (02) 4908 6800 Fax: (02) 4908 6810
ABN 43 692 285 758
www.epa.nsw.gov.au

## Appendix 4 - Correspondence with NSW Fisheries re Hunter River monitoring

**TOMAGO ALUMINIUM** Company Pty. Limited
A.C.N. 001 862 228

Tomago Road,
TOMAGO N.S.W. 2322
Postal Address,
P.O. Box 405,
Raymond Terrace N.S.W. 2324
Australia
Telephone (049) 66 9669
Telex AA28513
FAX 049 669711

NR/EM.1335

1 March 1995

Mr John Holliday
Fisheries Research Station
**SALAMANDER BAY NSW 2301**

Dear Sir

Further to correspondence (NR/EM.1327) I would like to submit for your comment the following proposed Hunter River monitoring methodology.

Regards

Neil Roser
Neil Roser
**Environment Officer**

# HUNTER RIVER MONITORING

## BACKGROUND

This monitoring program has been developed by Tomago Aluminium Company in consultation with NSW Fisheries to meet the approval conditions for the expansion of Tomago Aluminium smelter. This condition resulted following unsubstantiated claims in 1990 that stormwater released from the smelter site during a period of flood in the Hunter River caused the death of oysters in the Fern Bay/Fullerton Cove area. Due to the operational difficulties in maintaining the program modifications from the 1992 methodology have had to be implemented.

## OBJECTIVE OF MONITORING PROGRAM

The monitoring program is designed to confirm stormwater discharged from the Tomago Aluminium smelter site has no adverse impact on the water quality of the Hunter River.

We envisage that the data obtained from the analysis of oysters will be used to establish the normal range of elements found in oysters in the Hunter River. In the event of any future widespread death of oysters, a comparison of elements present may be made to assist in ascertaining if the possible cause of death is due to stormwater discharged from the smelter.

## MONITORING PROGRAM DESIGN

The program is designed around 3 key monitoring areas:

1. Discharge from the stormwater collection basin at the smelter site.

   A stormwater pond and sedimentation basin is installed on site to contain the first flush of water after a rain event. If substantial rain is received, the water then passes over a weir and is discharged to the Hunter River. Stormwater leaving the site is continuously analysed for pH, conductivity and fluoride. Automatic hourly samples are also taken at this point and a weekly composite sample is formed and analysed for the following elements:

   Sodium, Potassium, Aluminium, Magnesium, Silicon, Sulphate, Phosphate, Iron, Manganese, Molybdenum, Nickel, Cobalt Chromium, Lead, Zinc, Copper, Cadmium, Cyanide.

2. Sediment monitoring 100 metres upstream and downstream of the company's stormwater discharge point.

Triplicate samples of river sediment are taken on a 3 monthly basis at sites 100 metres upstream and downstream from the discharge point. These samples will be analysed for Sodium, Potassium, Aluminium, Magnesium, Silicon, Sulphate, Phosphate, Iron, Manganese, Molybdenum, Nickel, Cobalt, Chromium, Lead, Zinc, Copper, Cadmium, Cyanide, Fluoride.

3. Oyster Monitoring at Fern Bay

Due to the difficulty in maintaining oysters at the discharge point it is proposed that a basket of oysters be placed on leases operated by Mr Terry Jones.

It is proposed that 20 dozen oysters from Port Stephens Estuary be purchased and inspected. An initial sample of 10 oysters will be taken and analysed to establish background levels. The remaining oysters will be placed in a poly basket and placed on the lease. Every 3 months a sample of 10 oysters will be taken from the basket and analysed. In the event of an oyster kill, a sample will be extracted from the basket to ascertain if abnormal levels of elements that we analyse for are present.

I have enclosed copies of our sample preparation and analysis methods. We welcome your comments and the opportunity to discuss this program.

Regards

Neil Roser

Neil Roser

**Environment Officer**

# NSW FISHERIES

Mr Neil Roser
Environmental Officer
Tomago Aluminium Pty Ltd
PO Box 405
Raymond Terrace NSW 2324

Our Ref: HB (C): 3422
Your Ref: NR/EM.1335

24 March 1995

**RE: Environmental Monitoring in the Hunter River**

Dear Mr Roser

Thank you for your letter dated 1 March 1995, regarding changes in methodology for your monitoring program in the Hunter River. NSW Fisheries accepts the changes on condition that a copy of the methodology for fluoride analysis is forwarded to the Port Stephens Fisheries Research Station.

For further information on the above, please contact John Holliday, acting Habitat Biologist, on (049) 821232.

Yours faithfully,

John Holliday
for
Paul Crew
Director NSW Fisheries

**From:** Robyn Parker <Robyn.Parker@tomago.com.au>
**Sent:** Wednesday, August 28, 2024 8:52 AM
**To:** Cherie Colyer-Morris <cherie.colyer-morris@dpi.nsw.gov.au>
**Subject:** Tomago Aluminium Consent Condition

Hi Cherie,

I am not sure who to direct this query to. If you are not the right person, would you kindly pass on?

Tomago Aluminium (TAC) has a clause in the conditions of consent (DA 4908/90 dated 02 August 1990) as follows:

> 48. (b) A bio-accumulation and sediment monitoring program for fluoride and other relevant substances be established at the nearest feasible location or locations downstream from the point where the stormwater discharge enters the Hunter River with the experimental design being developed in consultation with NSW Agriculture and Fisheries.

In regards to the bioaccumulation monitoring program, oysters were monitored from a commercial farm at Fullerton Cove as the closest downstream feasible location, as per the attached communication from 1995.

In 2011, the commercial oyster farm ceased to exist, so from 2012 wild oysters have been sampled annually along the riverbank at the same locations as the sediment samples (500 metres upstream, 500m downstream and adjacent to the outlet of TAC's stormwater discharge point). A range of metals and fluoride are determined on these samples, as per the Annual Environment Reports that are sent to you. In 2023 there were no oysters available at these locations (the oysters seemed to decline in numbers rapidly during the very wet years of 2021 and 2022), and it was planned to establish a suitable site further downstream, however no such sites have been able to be found. TAC is seeking guidance on how to proceed in 2024 and beyond to meet this consent condition. TAC would propose that either

a) The Department agrees that there is no feasible option and the oyster program be discontinued, given there is approximately 30 years of data already gathered.
b) TAC develops an alternate feasible program with the Department's guidance.

I would be pleased to discuss at your convenience.

Thanks and regards


**Robyn Parker** Superintendent - Environment

638 Tomago Road, Tomago, NSW 2322
M 0409 913 473 T 02 4966 9329
E Robyn.Parker@tomago.com.au | www.tomago.com.au