



**LUGGAGE POINT RESOURCE
RECOVERY CENTRE ODOUR MANAGEMENT**

1. INTRODUCTION

Urban Utilities (UU) operates Luggage Point Resource Recovery Centre (RRC), located on Main Beach Road, Pinkenba immediately adjacent to the mouth of the Brisbane River. Daily flows average to 140ML/day – 60% of Brisbane sewage flows.

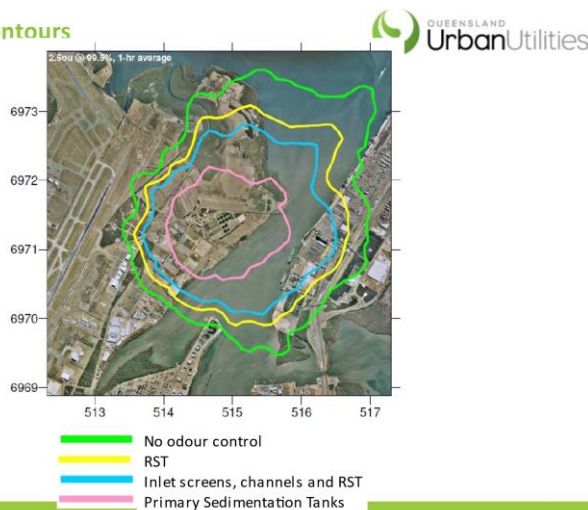
Luggage Point RRC has historically not been a source of odour nuisance to nearby receptors as these were limited to industrial activities. However recent developments have included the establishment of the Brisbane International Cruise Ship Terminal (BICT) and extension of the Brisbane Airport runway. In addition there has been an extensive expansion of entities establishing their premises closer to the plant.

The more relevant change has been the Resource Recovery (with the support of the wider Urban Utilities business) decision to commence biosolids drying on the drying beds. This activity has increased the odour potential from the plant.

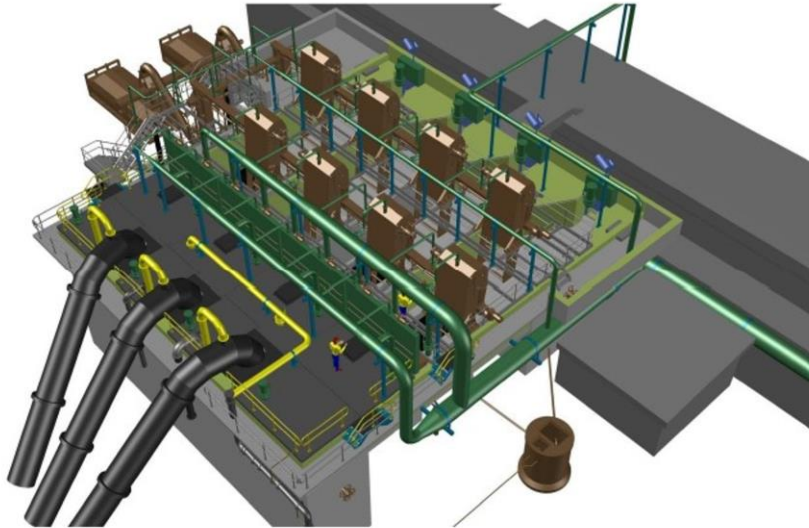
This document will detail the sensitive receptors and the strategy and operational assets that have been deployed to monitor and suppress the impact of noxious odours on those receptors. These have changed over the past 4 years including extension expansion of commercial premises along the roads approaching the plant. Of pertinent impact is the Brisbane International Cruise Terminal (BICT), and the new Brisbane Airport Corporation (BAC) runway.

First activity and following the commencement of planning for the construction of the BICT adjacent to Luggage Point and in collaboration with Brisbane Port Authority, Urban Utilities installed an odour control unit supported by strategic dosing capability for ferrous chloride ($FeCl_2$) into the incoming rising main. This was considered adequate treatment for the known odour impacts at that time in 2019. However the opening of the BICT was delayed by Covid 19.

Odour Contours



Inlet Screen Coverage

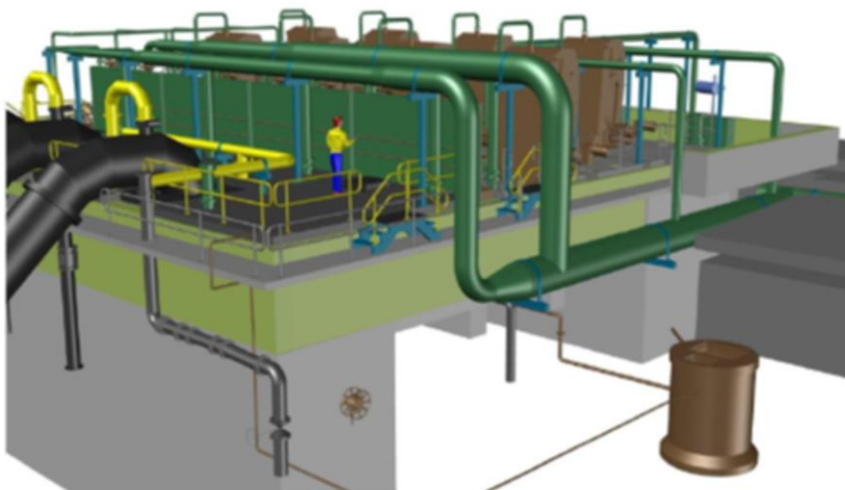


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Inlet Screen Coverage



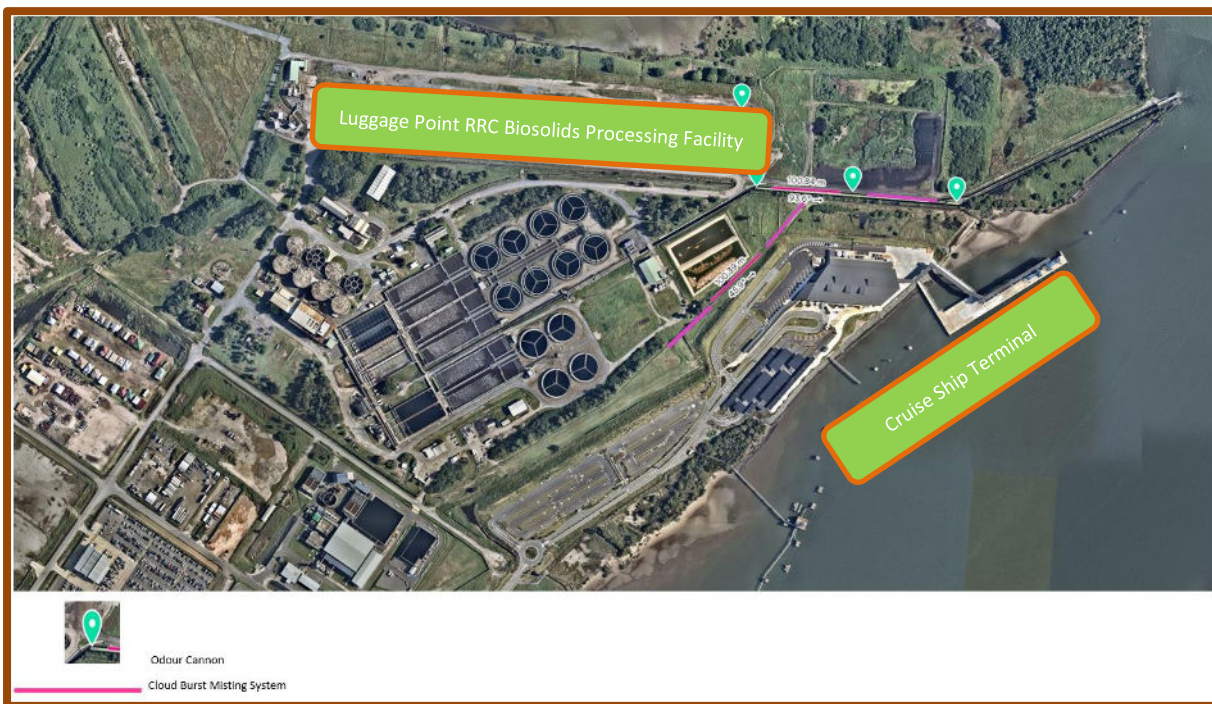
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Second in 2021 operational changes to the management of biosolids commenced at UU. This change commenced in November of that year with all biosolids produced on the 26 resource recovery centres at UU being transported to Luggage Point RRC for further processing on the drying beds. These beds had not been operational since 2003 but were assessed as having sufficient capacity to process the biosolids inventory reducing the total volume by weight by up to 50%. This presented a substantial reduction in transport costs for UU and provided the opportunity for up to 12 months storage. Given the emerging contaminants issues this was considered essential to providing time for planning activities to be undertaken.

This activity increased the odour control requirements as the installed system only treated odour at the inlet works. In addition the original operating licence had a new paragraph added addressing UU being responsible for the operation and maintenance planning of the odour management equipment with consultation and forecasting with PBPL (Port of Brisbane) to remove all odour impacts on the adjacent Cruise Ship Terminal.



The resultant additional odour management equipment was installed in a rapid 6 week project and provides a 3 facet platform to address the release of unacceptable odours generated in the operational processing of biosolids on and around the drying beds at Luggage Point RRC.

- A fence mounted misting system – Cloudburst – 600 mt of pipework with 40 spray heads per 100mt
- 20 mt spray cannons
- Odour monitoring

2. ODOUR CONTROL

2.1.1 Misting System



Cloudburst Misting

The Cloudburst misting system initially provided a continuous mist via 6 x 100 metre long pipelines that utilises an odourising product, potable water and a low pressure pump to push the liquid through 40 misting tees on each run. Water pressure required for the system – 600 to 120 PSI. Spec follows –

- 1 x Twist 2 Clean (pre filter) 105 micron
 - 1 X MixRite Water Powered Proportioning Pump -500:1 to 50:1
 - 1 X 3/8" Push Lock x Drain Valve x 3/8" Push Lock
 - 1 X 100 metres Black 3/8" OD High Pressure Nylon 12 Tubing
 - 40 X CB112 Misting Tee 3/8" Push Lock x 10/24 x 3/8" Push Lock CB112-10 Medium Low Flow Misting Nozzle W/ Removable Pin and Anti-Drip body, spring and Stopper
 - 1 x CB405 1000 PSI High Pressure CAT Triplex plunger pump (with tank fittings)
- The pump quoted has a maximum capacity of 45 x CB112-10 misting nozzles at 900-1000 psi
High Pressure Misting Pump Module 1.18 gallons per minute with Filtration, Powder Coated Galvanized Steel Case, Solenoid Valve, Low Pressure Switch, Cat Pump.

The odourising product uses a bubble gum scent and masks sulphur and ammonia compounds in the atmospheric plumes. The system has successfully contained odours between the plant and the BICT and following complaints received to the southwest of the plant a further 600 metres has been installed on that boundary.

2.1.2 Cannon Sprays



Initially 2 cannons have been installed with spares available for additional coverage if needed.

The cannons use a similar mixture as the misting system but using pressure spray the mist into the air with a 20mt projection. The cannons are noisy and create a wet trail where they project. They are mobile and can be aimed at sensitive receptors or focus on the odour generator. The cannons were manufactured by Henan Balshuri Machinery and Equipment Co in Zhengzhou City, China. They are only used if required.

The misting systems are in operation 12 hours prior to a cruise ship in dock at the terminal or if the monitoring systems identify unacceptable odours are present and the wind direction is considered to be moving the odour in the direction of the terminal. This direction will usually be from the north and west. The

system remains operational until the ship leaves port. The system on the southwest boundary operates continuously at this point.

In the initial roll out the operation of the system is manual. The Odour Dosing Forecast System that operates the odour control for the influent does determine when the ferrous chloride dosing at Luggage Point needs to be turned on/off. The PBPL application generates a schedule that is sent to QUU to control pumps. In return, QUU send PBPL information to confirm (a) if the dosing is on or off (b) how much chemical was consumed. The integration of the misting systems to this control will be assessed but could not impact the rapid deployment and operation of the misting systems.

The future BICT vessel call schedule is automatically extracted from the Maritime Safety Queensland (MSQ) QSHIPS database. The QSHIPS database is interrogated to filter for all planned shipping movements to and from the BICT up to 30 days in advance. If late bookings occur these are managed via the Unplanned and Unforeseen Events process.

3. Odour Monitoring

It is critical that UU understands the odour generation at each source area on the Luggage Point RRC. UU have installed equipment provided by Envirosuite at various locations based on odour studies and sensitive receptors around the plant. Two odour modelling studies were used – 2018 and 2022. Two areas stand out – Inlet area and PSTs and the drying operations.

Odour Modelling 2018

Process Unit	Area (m ²)	SOER * (OU.m ² /m ³ .s)	Odour Emissions (OU.m ³ /s)	Percentage
Inlet Works	370	-		0%
Air Treatment Facility	7.2 m ³ /s	500 OU	3,600	4%
Grit channel	542	77.5	42,005	12%
PSTs	9,714	16.6	161,252	45%
Bioreactor - Anaerobic channel	1,600	0.17	272	0.1%
Bioreactor - Aerobic Zone	8,500	0.13	1,105	0.3%
Bioreactor - Anoxic Zone	10,600	0.21	2,226	1%
Return Activated Sludge (RAS) channel	475	0.21	100	0.03%
Mixed liquor channels (FST1-8)	600	0.13	78	0.02%
RST units		-		
Sludge Storage Tanks (aeration off)	630	5	3,150	1%
Sludge Storage Tanks (aeration on)	630	10	6,300	2%
Dissolved Air Flotation (DAF1 +DAF2)	305	0.12	37	0.0%
Sludge Dewatering	200	0.8	160	0.0%
Dewatering Plant centrate pit	2	0.5	1	0.0%
Dewatered Sludge Storage Area	150	3.8	570	0.2%
Dewatered Sludge Loadout	500	3.8	1,900	1%
Sludge Drying - Topfield Stockpile	19,000	4.7	89,300	25.0%
Sludge Drying Bed (1 - east)	11,250	1.85	20,813	5.8%
Sludge Drying Bed (2 - centre, east)	11,250	0.7	7,875	2.2%
Sludge Drying Bed (3 - centre, west)	11,250	0.4	4,500	1.3%
Sludge Drying Bed (4 - west)	11,250	0.4	4,500	1.3%
L-Berm (Final dry product)	8,000	0.2	1,600	0.4%
TOTAL			357,531	

Odour Modelling 2022

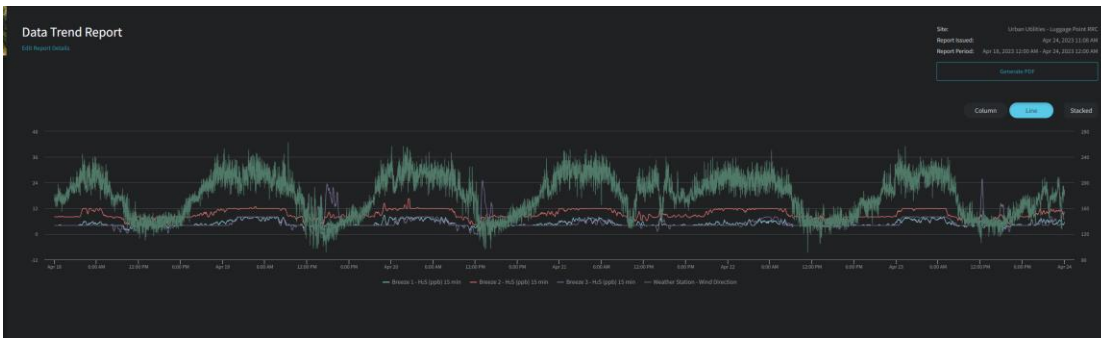
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Inlet Works	370	-	-	0%
Air Treatment Facility	7.2 m ² /s	500 OU	3,600	2%
Grit channel	542	14.9	8,076	4%
FSTs	9,714	2.6	25,256	14%
Bioreactor - Anaerobic channel	1,600	0.17	272	0.1%
Bioreactor - Aerobic Zone	8,500	0.13	1,105	0.6%
Bioreactor - Anoxic Zone	10,600	0.21	2,226	1%
Return Activated Sludge (RAS) channel	475	0.21	100	0.05%
Mixed liquor channels (FST3-B)	600	0.13	78	0.04%
RST units	-	-	-	0%
Sludge Storage Tanks (aeration off)	630	5	3,150	2%
Sludge Storage Tanks (aeration on)	630	10	6,300	3%
Dissolved Air Flotation (DAF1 +DAF2)	305	0.12	37	0.0%
Sludge Dewatering	200	0.8	160	0.1%
Dewatering Plant centrale pit	2	0.5	1	0.0%
Dewatered Sludge Storage Area	150	3.8	570	0.3%
Dewatered Sludge Loadout	500	3.8	1,900	1%
Sludge import laydown area	1,875	3.3	6,188	3.3%
Sludge Drying - Topfield Stockpile	19,000	4.7	89,300	47.7%
Sludge Drying Bed (1 - east)	11,250	1.85	20,813	11.1%
Sludge Drying Bed (2 - centre, east)	11,250	0.7	7,875	4.2%
Sludge Drying Bed (3 - centre, west)	11,250	0.4	4,500	2.4%
Sludge Drying Bed (4 - west)	11,250	0.4	4,500	2.4%
L-Berm (Final dry product)	8,000	0.2	1,600	0.9%
TOTAL			187,606	

Using this information and identifying the impacts of wind direction and the location of the sensitive receptors (BICT, Brisbane Airport) the odour monitors are installed as below.



The green dots are the monitor locations, the green cone shapes are the wind direction and speed, and indicate the readings are within acceptable parameters for odour intensity at this time on this day. The system also measures H2S, NH3, and VOC.

The system enables reporting on an hourly basis both real time and historic. This has proved highly beneficial both in preventing complaints and responding with facts when received.



This monitoring has provided data that has assisted our decision making on where we need odour control and what system best suits the situation.

We can say as yet that odour at Luggage Point is controlled with the 3 facet platform we have established and we are achieving a better control on odours impacting sensitive receptors.