2026 Australian Landfill & Transfer Station Conference

Marsden Park

Land Restoration

Marsden Park Landfill - Closure





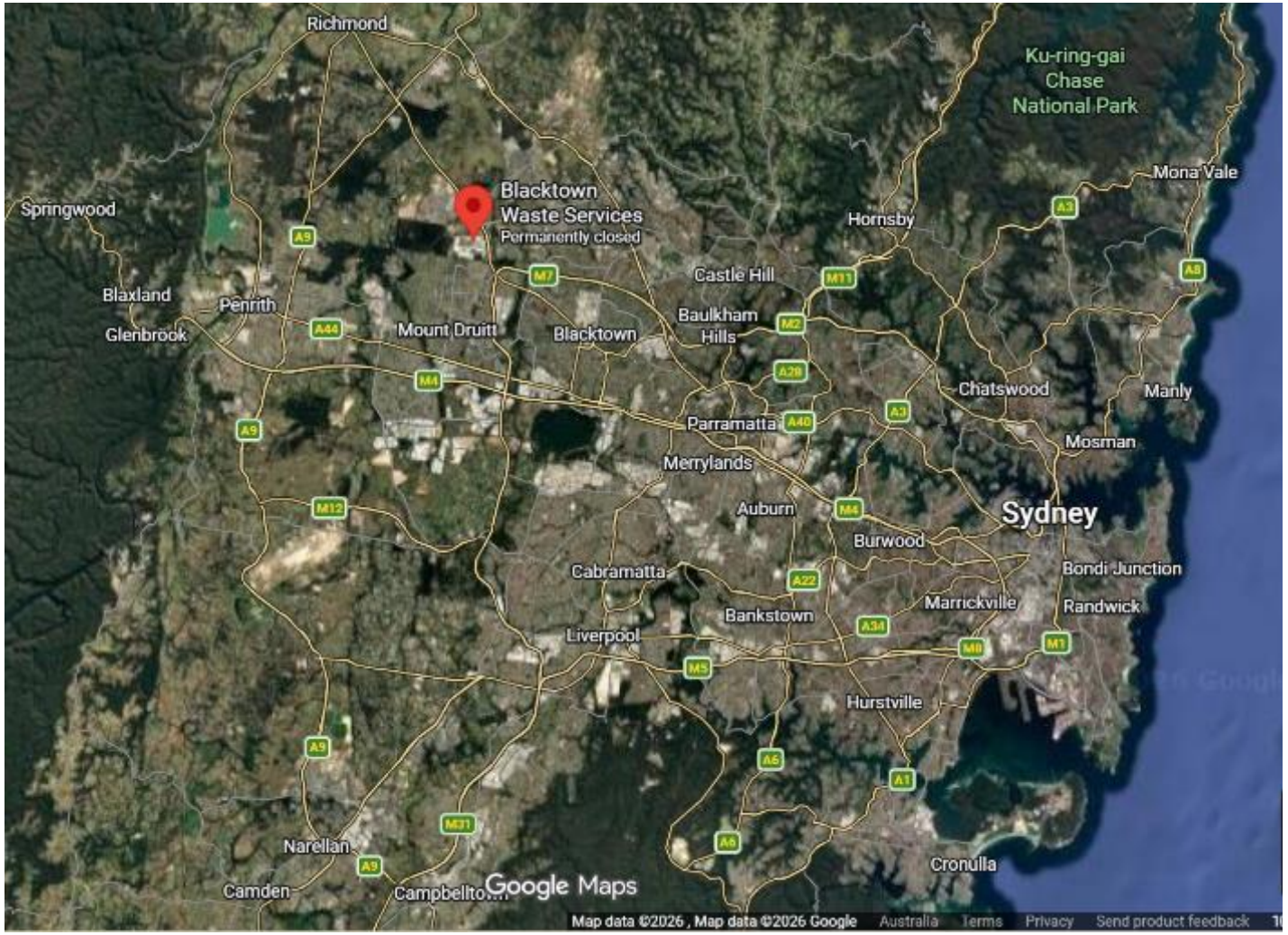
Dr Stuart Dever, Jaidyn Cumming, Harry Singh

Marsden Park

Land Restoration

Marsden Park Landfill - Closure

Background



Marsden Park Landfill - Closure

Marsden Park
Land Restoration

Background



Sydney Business Park
Marsden Park
2026

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Background



Circa 2002

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Background

- Obtained approval to quarry and landfill in 2000
- Commenced landfill operations in 2004 (EPL 11497)
- Non-putrescible solid waste + ACM only
- Total landfilled waste: 3.85 million tonnes
- 3 Landfill Cells: 25 to 50m deep
- Total LF airspace: 3.4 million m^3





Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Background

- No engineered landfill lining system (base or side walls). Containment of leachate and LFG reliant on low permeability in-situ geological setting (~ 25m equivalent to benchmark clay liner)
- Basal leachate drainage layer & 3 leachate risers (1 per landfill cell)
- Leachate has been managed on site
- Regular groundwater and surface water monitoring (as per EPL)
- Regular landfill gas monitoring (as per EPL)
- LFG collection and flaring system installed (2017 – 2020)





Plate 10: Drainage aggregate placed along main leachate drain. Main drain underlain by layer of geotextile .

Marsden Park Landfill - Closure

Marsden Park
Land Restoration

Background

- No engineered landfil
  Containment of leach
  geological setting – 2
- Basal leachate draina
- Leachate has been m
- LFG collection and fla

Landfill gas detected – 2015
(~20% CH_4 v/v)
(before adjacent Ikea warehouse existed
& before LFG extraction system installed)



Marsden Park
Landfill 2015

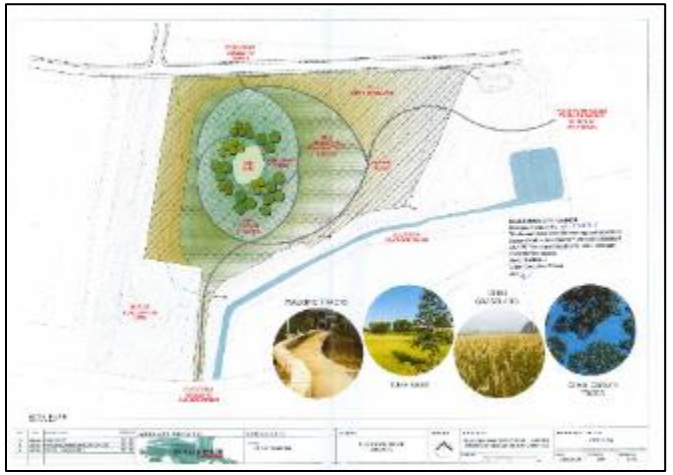
Marsden Park Landfill - Closure

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Land Restoration

Landfill Closure Requirements

- Defined by Consent (MOD 22-00286),
  EPA Licence (11497) and EPA Solid Waste Landfill Guidelines
- Consent:
  - Landfilling to cease by 31 Dec 2025
  - Landfill closure works to be completed by 31 Dec 2028 (3 years)
  - Final landform height / shape
  - Final land use
  - Site landscaping and rehab plan





Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Landfill Closure Requirements

O4.11 Leachate must be managed in the following manner:

a) discharged into the leachate storage dam; and/or
b) injected into landfilled waste; and/or
c) irrigated onto the active tipping face; and/or
d) removed by tanker off-site to a premises which can lawfully receive it

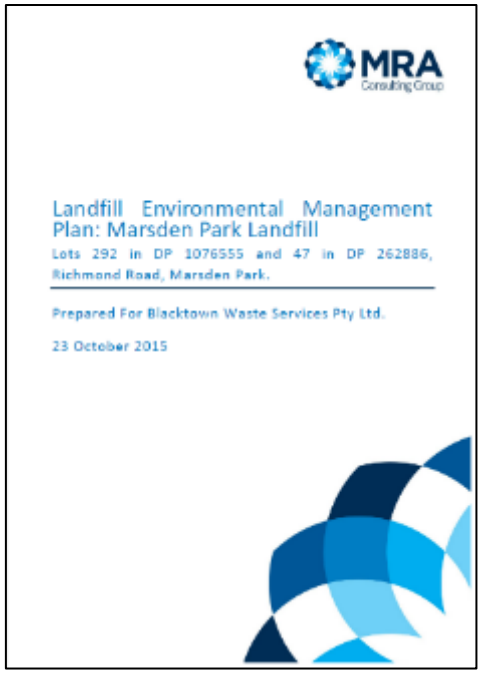
- EPL (11497)
  - Submit Landfill Closure Plan (LCP) to EPA 3 months in advance of landfill ceasing i.e. 30 Sept 2025
  - Site capping and revegetation
  - Leachate management
  - Landfill gas management
  - Environmental monitoring, recording & reporting, including discharge requirements / limits

Landfill Capping:
- 200mm revegetation layer
- 500mm compacted clay (k< 1x 10^{-8}m/s)
- 300mm gas drainage layer

Landfill Gas Management Plan

O4.22 In the event that more than two consecutive monitoring events detect methane at concentrations above 1.25% (v/v) in the sub-surface gas monitoring wells, the licensee must submit to the EPA, a program for the management of landfill gas from the landfilled waste. The program must be submitted to the EPA within 3





Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Landfill Closure Requirements

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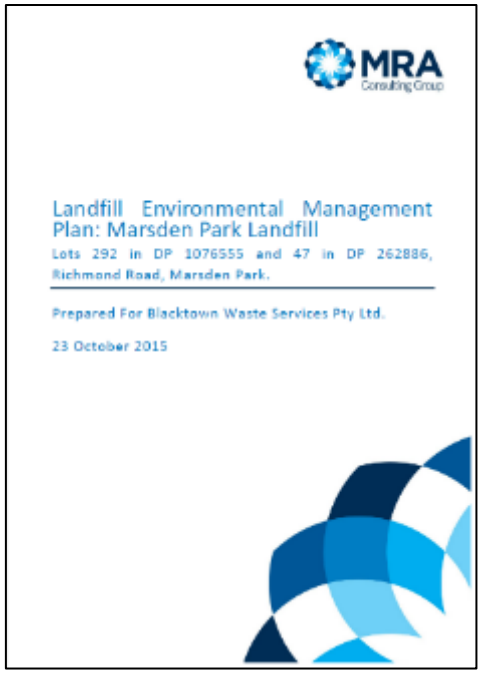
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CONSULTING EARTH SCIENTISTS

LANDFILL ENVIRONMENTAL MANAGEMENT PLAN:
MARSDEN PARK LANDFILL
LOTS 28 AND 47 IN DP 262886, RICHMOND ROAD, MARSDEN PARK.
PREPARED FOR BLACKTOWN WASTE SERVICES PTY LTD.
VOLUME 1 OF 2 - REPORT


MRA Consulting Group

Landfill Environmental Management Plan: Marsden Park Landfill

Lots 292 in DP 1076555 and 47 in DP 262886, Richmond Road, Marsden Park.

Prepared For Blacktown Waste Services Pty Ltd.

23 October 2015

Marsden Park Landfill - Closure

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Land Restoration

Landfill Closure Requirements

- EPA Guidelines (2016)

9. **Final capping and revegetation** **53**

9.1 Final capping requirements 53

9.2 Monitoring the cap's integrity and performance 55

9.3 Justification of alternative capping 55

9.4 Alternative caps: phytocaps 56

10. **Closure** **59**

10.1 The closure plan 59

10.2 Certified statement of completion 60

10.3 Development on closed landfills 60

Marsden Park Landfill - Closure

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Land Restoration

Landfill Closure Requirements

- EPA Guidelines (2016) – Closure Plan

The closure plan should:

- specify the steps taken or to be taken in closing and stabilising the landfill, and the time frame for doing so
- specify the detailed design, the materials to be used and the construction quality assurance plan for the final capping, in accordance with the requirements of sections 9 and 11 of these guidelines
- specify post-closure management and monitoring measures (sometimes called aftercare) for leachate, stormwater, landfill gas, odour, dust, litter and final cap integrity
- identify any proposed future use of the site
- be consistent with all applicable conditions of the development consent or other planning approvals that apply to the premises
- make sure that neighbouring residents are advised of the contact persons for discussing any problems (e.g. odour emissions); records of these complaints should be kept in the same way as during operation
- make sure that waste is not received for disposal at the site after landfill operations cease. Wastes intended for use during remediation of the premises should be documented and reported in the same way as for an operating facility; see section 7 of these guidelines.

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Landfill Closure Requirements

- EPA Guidelines (2016) – Closure Plan requirements:
  - Closure works and program
  - Landfill capping design, drawings, specification and CQA Plan
  - Post-closure management and monitoring measures
  - Proposed future use of the site
  - Comply with conditions of the development consent
  - Method / mechanism for receiving and managing complaints
  - Measures for ensuring waste is not received for disposal at the site after closure

Marsden Park Landfill - Closure

Marsden Park
Land Restoration

Landfill Closure Requirements

- EPA Guidelines (2016)
  - Stormwater management
  - Leachate storage and disposal
  - Landfill gas management
  - Monitoring









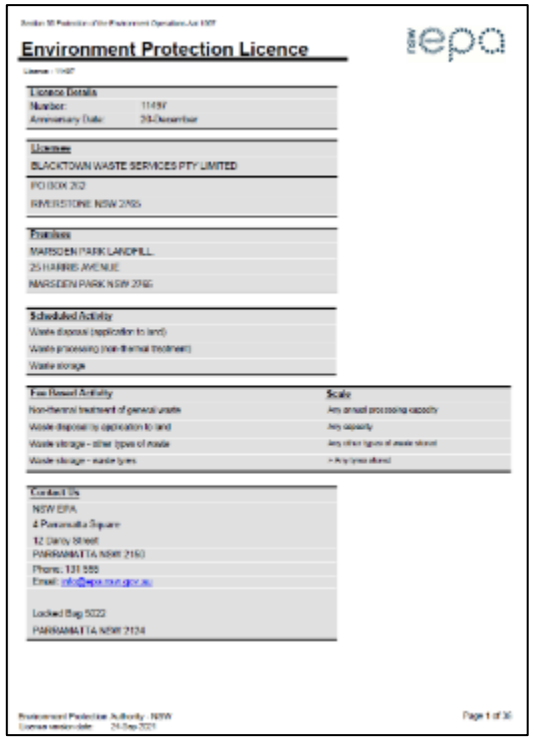
Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Process / Program

- Preliminary work (2019 – 2022):
  - Final landform height / shape (Consent modification 2019)
  - Extension of time to undertake the Landfill Closure works: 2026 - 31 Dec 2028 (Consent modification 2022 – 23)
  - Preliminary evaluation of leachate and landfill gas generation
- Commenced in earnest in early 2023
- Investigate and evaluate the existing landfill
  - Approvals (Consent, EPA Licence)
  - Waste types and quantities
  - Landfill airspace consumption / utilisation
  - Existing landform v approved final landform (how much landfill airspace capacity and time remaining?)



Environment Protection Licence

epa

Licence Details

Number: 11497

Anniversary Date: 28 December

Licensee

BLACKTOWN WASTE SERVICES PTY LIMITED

PO BOX 202

RIVERSTONE NSW 2765

Premises

MARSDEN PARK LANDFILL

25 HARRIS AVENUE

MARSDEN PARK NSW 2765

Scheduled Activity

Waste disposal (application to land)

Waste processing (non-thermal treatment)

Waste storage

Fee Based Activity	Scale
Non-thermal treatment of general waste	Any annual processing capacity
Waste disposal by application to land	Any capacity
Waste storage – other types of waste	Any other types of waste stored
Waste storage – waste tyres	> Any tyres stored

Contact Us

NSW EPA

4 Parramatta Square

12 Darcy Street

PARRAMATTA NSW 2150

Phone: 131 555

Email: info@epa.nsw.gov.au

Locked Bag 5022

PARRAMATTA NSW 2124

Environment Protection Authority - NSW

Page 1 of 30

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Process / Program

- Investigate and evaluate the existing landfill (cont'd)
  - Landfill design & construction (historical reports)
  - Landfill operations (history)
  - Landfill cell perimeter bunds (condition / construction quality?)
  - Landfill cover layers
  - Cover soil supply on site (quantity and characteristics)





Plate 10: Drainage aggregate placed along main leachate drain. Main drain underlain by layer of geotextile .

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Process / Program

- Investigate and evaluate the existing landfill (cont'd)
  - Landfill gas generation and management
  - Leachate generation and management
  - Stormwater flows and management
  - Existing monitoring systems, programs and results
  - Settlement
  - Characteristics of the existing site and the surrounding land
  - Existing and proposed surrounding land use



- Development of preliminary conceptual site model (and identification of the data gaps)

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Process / Program

- Additional investigations, data collection, modelling, evaluation
  - Additional landfill gas monitoring wells (10)
  - Updated landfill gas modelling
  - Landfill gas system shut down study
  - Landfill risk assessment
  - Landfill gas management plan





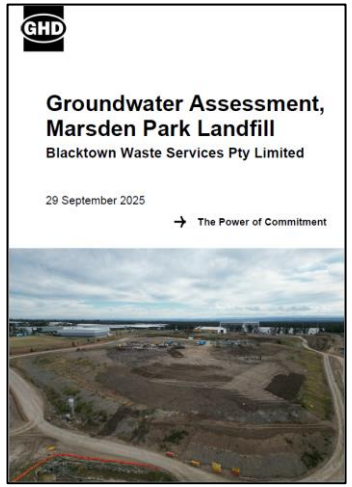


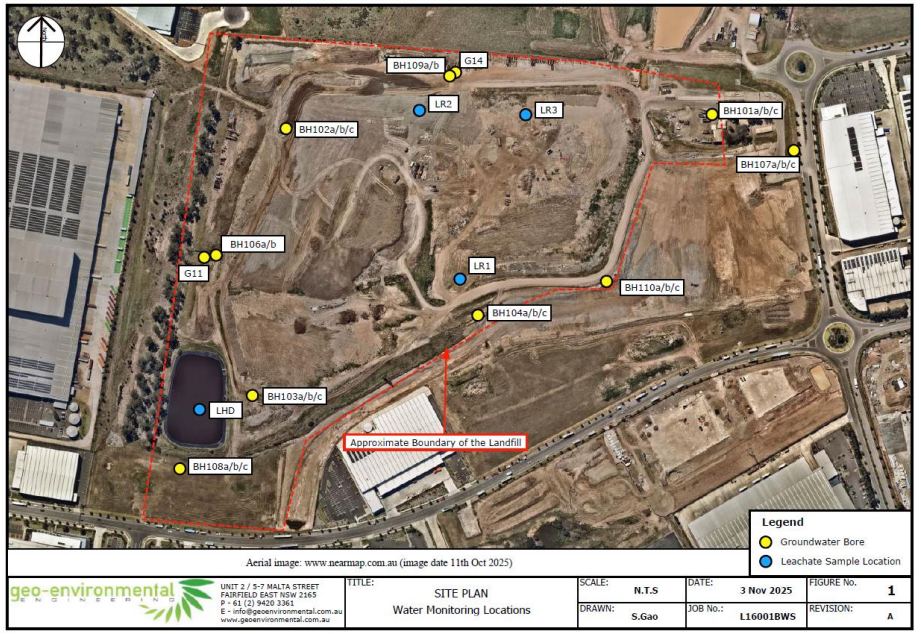
Marsden Park Landfill - Closure

Marsden Park
Land Restoration

Process / Program

- Additional investigations, data collection, modelling, evaluation (cont'd)
  - Additional groundwater monitoring wells (5 x 3 nested – shallow, mid, deep)
  - Additional dual LFG-Leachate extractions wells (in Cell 3)
  - Monitoring leachate levels (in the landfilled waste) via the landfill gas extraction wells
  - Additional leachate sampling and testing
  - Detailed leachate, groundwater and surface water study (GHD)
  - Independent advice from an EPA accredited Site Auditor





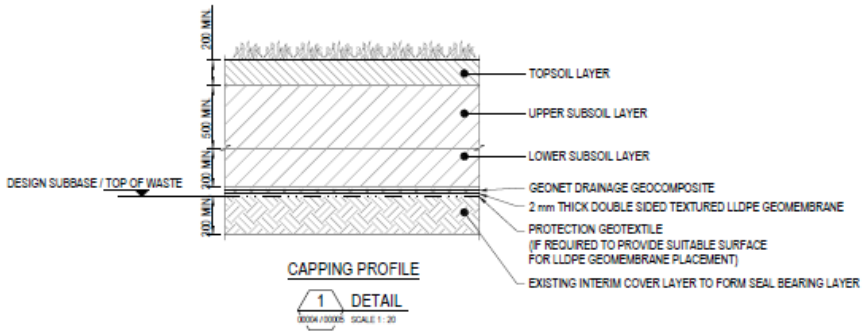
Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Process / Program

- Additional investigations, data collection, modelling, evaluation (cont'd)
  - Landfill water balancing modelling (GHD & MPLR)
  - Evaluation of landfill capping options
  - Evaluation of leachate treatment and disposal options, including consultation with Sydney Water
  - Interim leachate management plan





Marsden Park Landfill - Closure

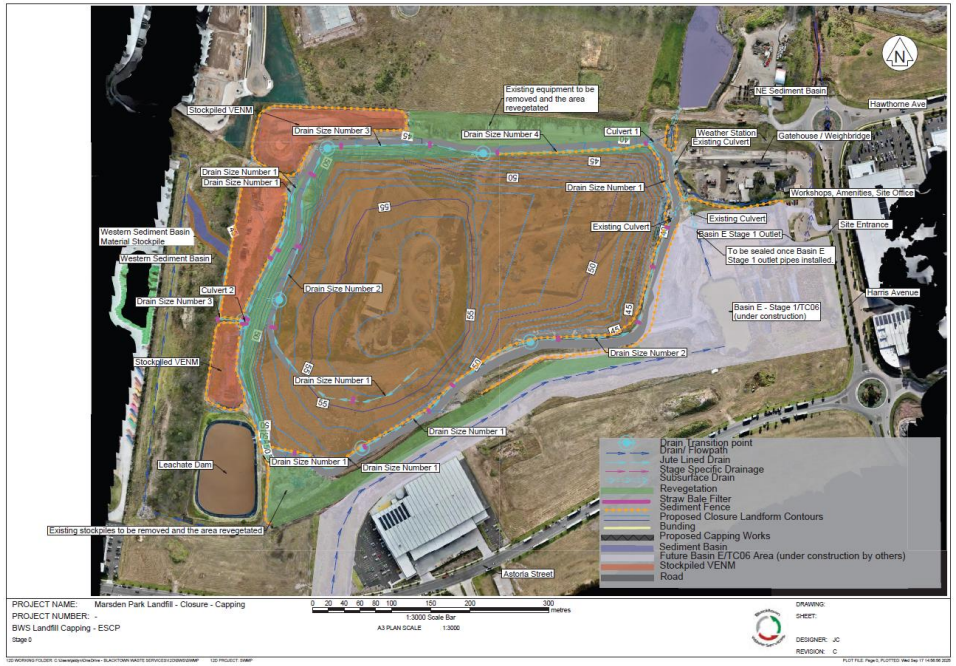
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Land Restoration

Process / Program

- Additional investigations, data collection, modelling, evaluation (cont'd)
  - Landfill cell perimeter bunds (condition, characteristics)
  - Stormwater flows
  - Soil and water management plan / erosion and sediment control plan
  - Expanded settlement monitoring program





Marsden Park Landfill - Closure

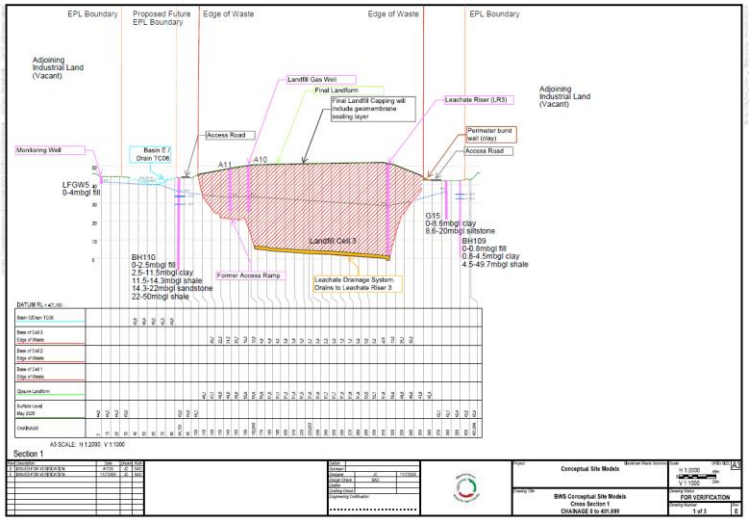
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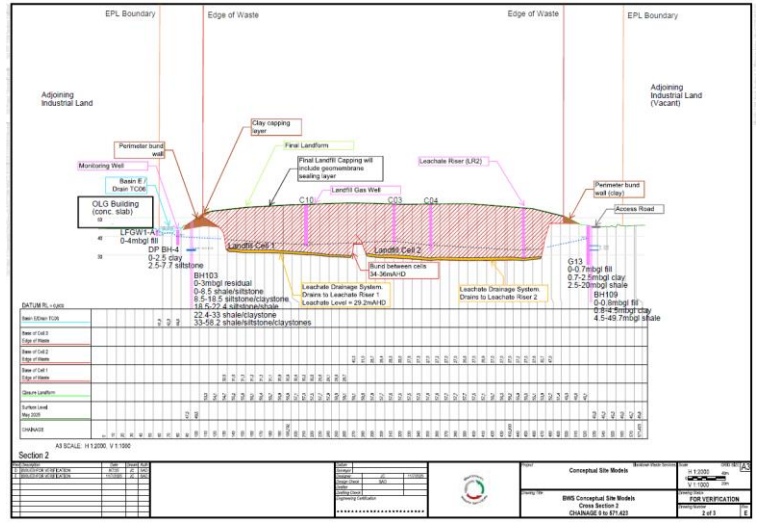
Land Restoration

Process / Program

- Updated conceptual site model and risk assessment







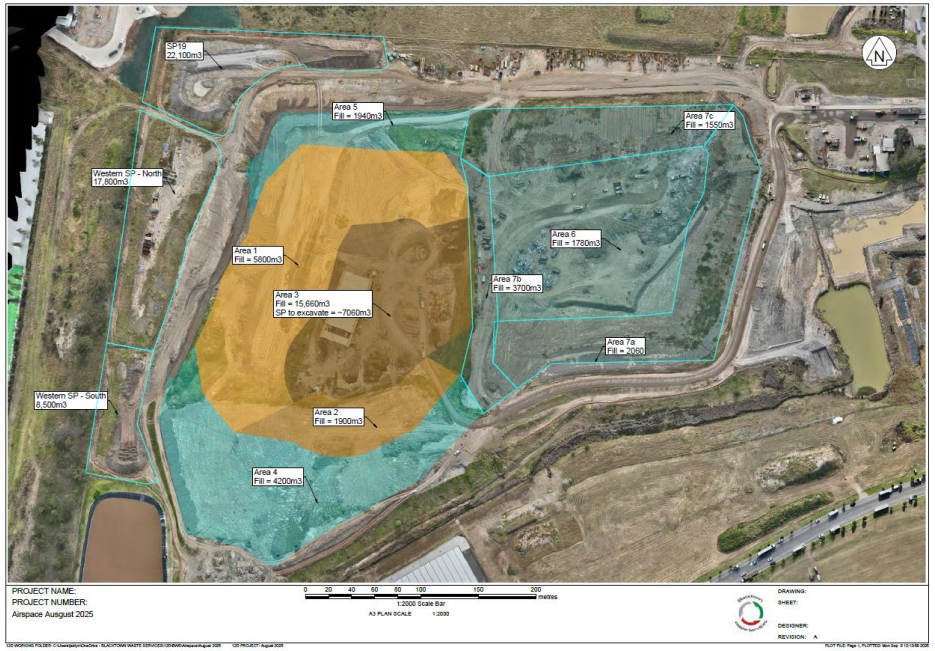
Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Process / Program

- Additional investigations, data collection, modelling, evaluation
  - Landfill air space monitoring & utilisation
  - Tracking how much remaining (m^3) (<u>to final landform</u>)
  - Survey (6 monthly => monthly => quarterly => monthly)
  - Forecasting tonnes required (mixed solid waste, ACM soil)
  - Tracking current projects & quotes
  - Monthly => weekly
  - Working closely with operations staff



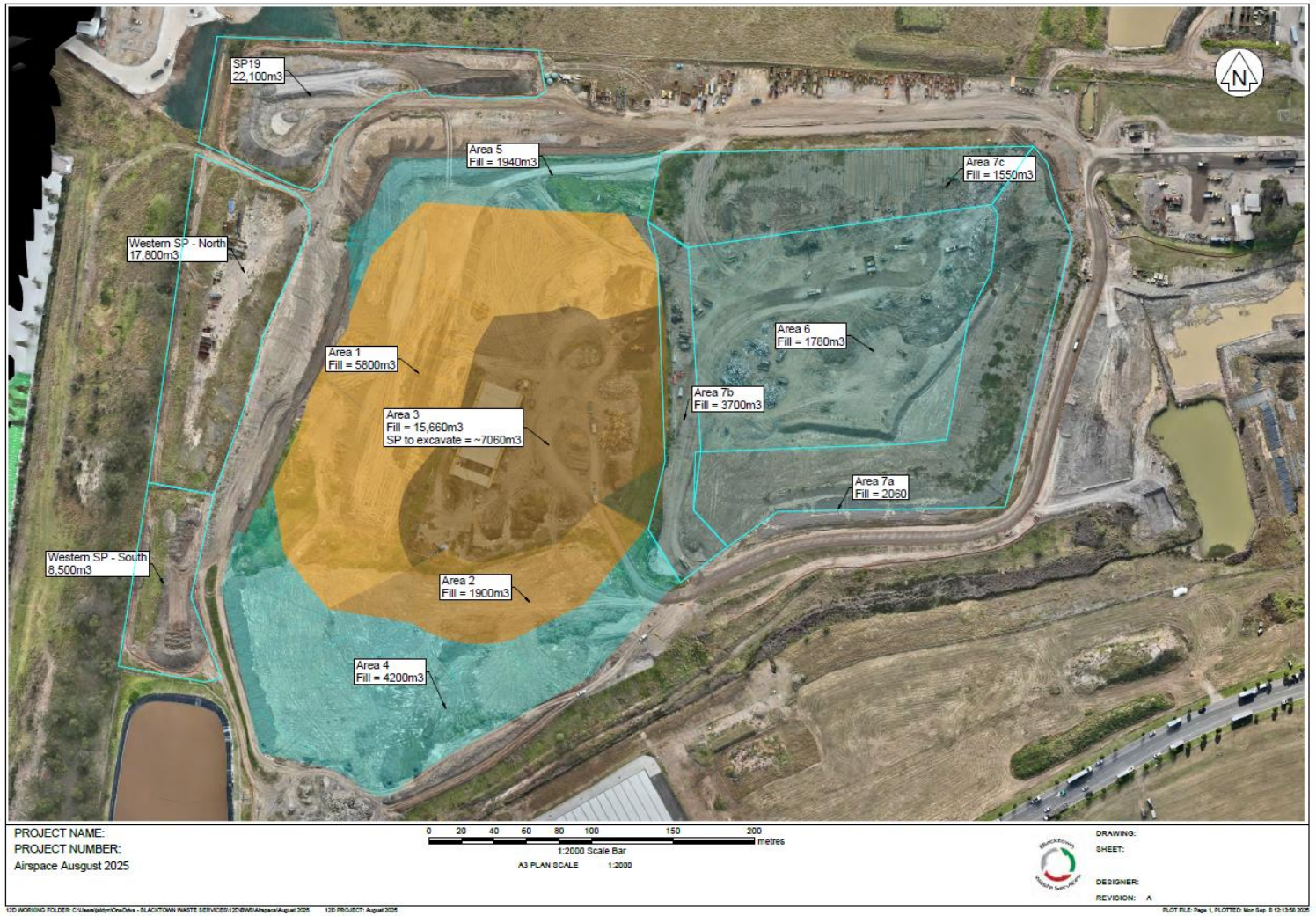
Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Process / Program

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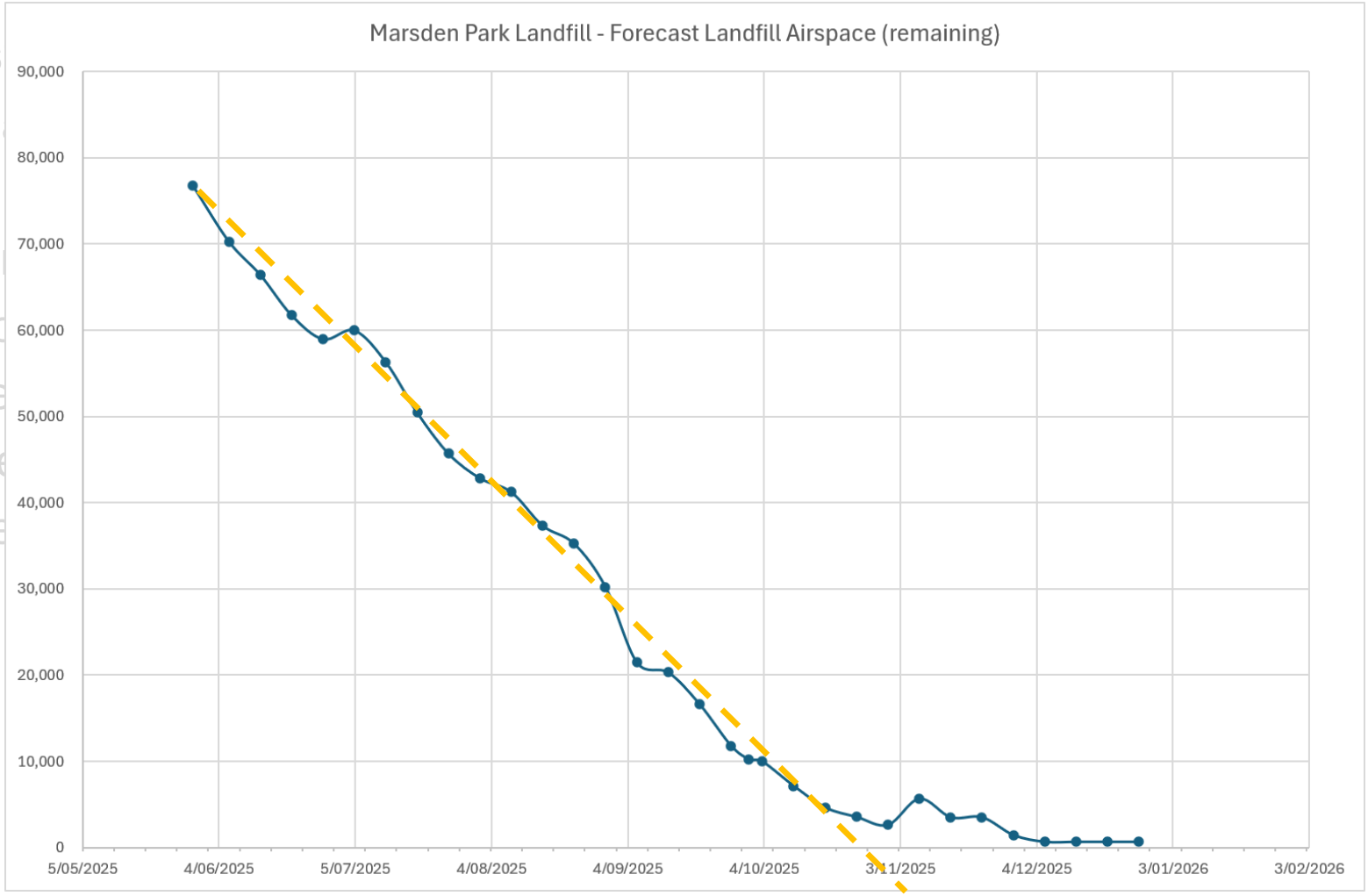
Marsden Park Landfill - Closure

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Land Restoration

Process / Program

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Marsden Park Landfill - Closure

Marsden Park
Land Restoration

Closure Plan

- Executive Summary
- Introduction
- Characteristics of the Site and Surrounding Land
- The Landfill
- Landfill Closure Requirements and Guidance
- Conceptual Site Model and Risks
- Landfill Closure Works
- Post Closure Management
- Submitted 30 Sep 2025


Blacktown Waste Services Pty Ltd
(ABN 21 102 860 944)

Marsden Park Landfill
(EPL 11497)

Landfill Closure Plan

Marsden Park Landfill - Closure

Marsden Park
Land Restoration

Closure Plan

- Landfill Closure Works
  - General
  - Landfill closure landform
  - Landfill gas management
  - Landfill capping
  - Revegetation and landscaping
  - Stormwater
  - Leachate and groundwater
  - Monitoring and reporting
  - Site fencing and signage
  - Facilities to be removed
  - Works program (to occur over 3 years until Dec 2028)


Blacktown Waste Services Pty Ltd
(ABN 21 302 860 944)

Marsden Park Landfill
(EPL 11497)

Landfill Closure Plan

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Closure Plan

- Post Closure Management
  - General
  - Approvals
  - Site layout and facilities
  - Final landform
  - Landscaping and revegetation
  - Landuse
  - Stormwater
  - Leachate and groundwater
  - Landfill gas
  - Other management
  - Monitoring and reporting
  - Site security and access control
  - Complaints



Blacktown Waste Services Pty Ltd

(ABN 21 302 860 944)

Marsden Park Landfill

(EPL 11497)

Landfill Closure Plan

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Challenges

- Old Consent / EPL conditions
- Old / outdated plans and reports:
  - Landfill Environmental Management Plan (LEMP 2015)
  - Leachate Management Plan (2003/2008)
  - Soil and Water Management Plan (2003)
  - Historical filling plans
- Insufficient data (leachate, GW, SW and LFG) to develop a sound Conceptual Site Model, and fully evaluate the landfill (impacts and risks)
- **Tracking and managing waste flow into the site**
- **Insufficient cover soil on site to undertake final covering**

Marsden Park Landfill - Closure

Marsden Park
Land Restoration

Challenges

- Finalising the landfill capping design geosynthetics components (not having the final cover soil)
- **Uncertainty about impact on PFAS on leachate management / disposal**
- Impact of Middle East conflicts on availability / supply of PE materials (landfill gas system, landfill capping)
- HR issues associated with maintaining operation of the facility up to closure

- **Obtaining EPA approvals (Closure Plan and EPA Licence Variation)**

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Learnings and Recommendations

- Commence landfill closure planning process as early as possible (3 - 5 years out??)
- Preliminary evaluation of the Landfill and develop CSM (to identify data gaps and additional investigations / monitoring)
- Early development of final landform and final staging / landfilling plan
- Set up system for tracking remaining landfill airspace and waste flow
  - Regular aerial surveys + tracking incoming waste + tracking future waste (quotes/jobs)
  - Track remaining landfill airspace to final closure landform surface

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Learnings and Recommendations

- Early consultation with the EPA
- Contingency planning – if approvals take longer than expected!

- Whole of life planning for landfill cover soil (landfill material balance)
- If insufficient soil on site for final cover, seek early EPA approval of capping design & waste levy exemption, so can source cover soils early
- If planning to use geosynthetics in the landfill capping prioritise obtaining sufficient cover soil for initial soil (protection) layer (300 – 500mm)

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

Learnings and Recommendations

- Settlement monitoring – implement early
  (really assists with assessing final landuse options)
- Value of maintaining good historical records
- Obtaining independent expert advice / assistance

Marsden Park Landfill - Closure

Marsden Park

Land Restoration

What's Next?

- Closure plan was approved by EPA in Feb 2026
- EPA Licence Variation was obtained July 2026
- Preliminary site upgrading works
  - Landfill cell perimeter bunding
  - Upgrading site stormwater drainage, including sediment basins
  - Upgrading site access roads





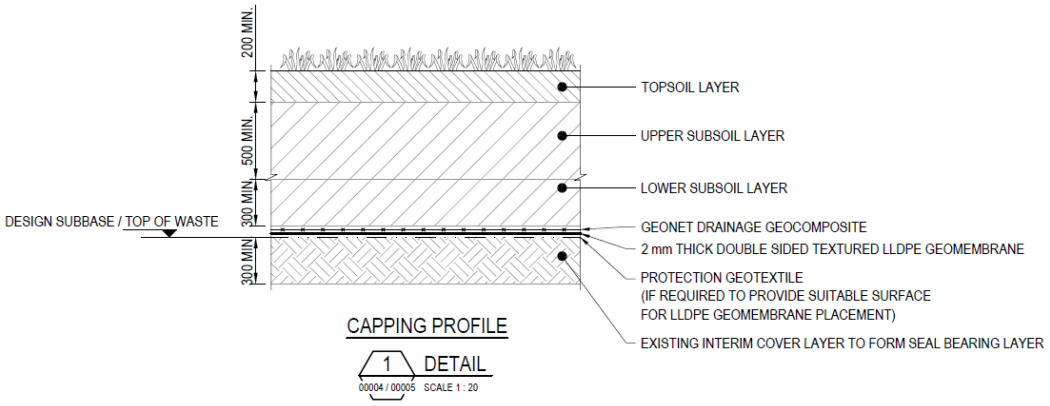
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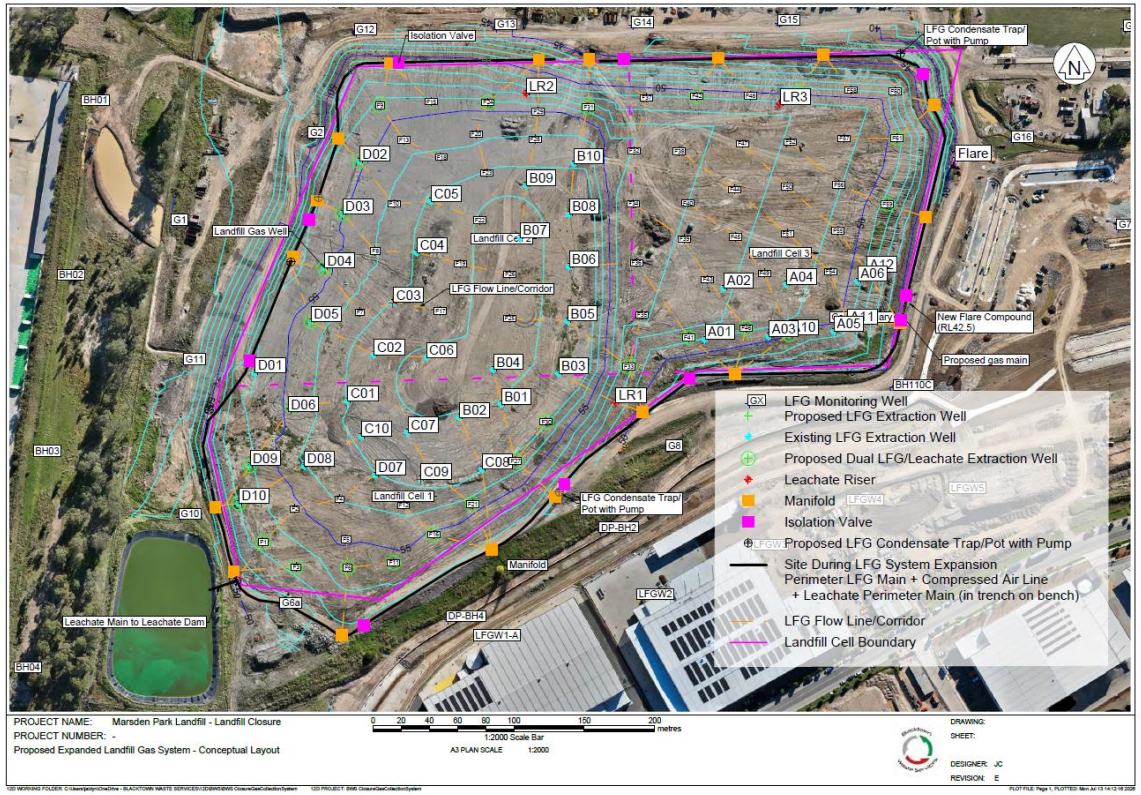
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Land Restoration

What's Next?

- Waste levy exemption
- Sourcing final cover soils (135,000m^3)
- Final landfill gas management system
- Landfill capping
- Revegetation and landscaping





Marsden Park Landfill - Closure

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Land Restoration

Questions?

Further information:

stuart@mplr.com.au

