



<b>Licence number</b>	L9335/2022/1
<b>Licence holder</b>	Thunderbird Operations Pty Ltd
<b>ACN</b>	611 351 743
<b>Registered business address</b>	Level 2, 41 - 47 Colin Street WEST PERTH WA 6005
<b>DWER file number</b>	DER2022/000219
<b>Duration</b>	14/12/2022 to 13/12/2037
<b>Date of amendment</b>	23/03/2023
<b>Premises details</b>	Thunderbird Mineral Sands Project  Legal description - Mining tenement L04/85, part of L04/86, part of M04/459, part of L04/84, L04/82 and L04/83  as defined by the premises map in Schedule 1 and the coordinates in Schedule 2

<b>Prescribed premises category description (Schedule 1, <i>Environmental Protection Regulations 1987</i>)</b>	<b>Assessed production capacity</b>
Category 8: Mineral sands mining or processing	Stage 1 mining: 12, 500,000 tonnes per annum
Category 54: Sewage facility	WWTP 1: 100 m <sup>3</sup> /day WWTP 2: 17.5 m <sup>3</sup> /day
Category 89: Putrescible landfill site	1,100 tonnes per annum

This licence is granted to the licence holder, subject to the attached conditions, on 23 March 2023, by:

## **A/MANAGER - RESOURCE INDUSTRIES**

### **REGULATORY SERVICES**

officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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## Licence history

Date	Reference number	Summary of changes
14/12/2022	L9335/2022/1	Licence granted
23/03/2023	L9335/2022/1	Licence amended to authorise operation of WWTP 2.

## Interpretation

In this licence:

- (a) the words ‘including’, ‘includes’ and ‘include’ in conditions mean “including but not limited to”, and similar, as appropriate;
- (b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;
- (c) where tables are used in a condition, each row in a table constitutes a separate condition;
- (d) any reference to an Australian or other standard, guideline, or code of practice in this licence:
  - (i) if dated, refers to that particular version; and
  - (ii) if not dated, refers to the latest version and therefore may be subject to change over time;
- (e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and
- (f) unless specified otherwise, all definitions are in accordance with the EP Act.

**NOTE:** This licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

## Licence conditions

The licence holder must ensure that the following conditions are complied with:

### Infrastructure and equipment

- The licence holder must ensure that the site infrastructure and equipment listed in Table 1 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 1.

**Table 1: Infrastructure and equipment requirements**

Site infrastructure and equipment	Operational requirement	Infrastructure location
Active mine pit	a) Base of mine pit to go no deeper than 75 m AHD. b) Water trucks containing water sufficient to be used for dust suppression available as required. c) Diversion bunds are to be used to divert surface water flows around active mine areas. d) Drainage from the mine excavation must be directed into holding sumps and used for dust suppression or ore processing.	Schedule 1, Figure 1 – Area marked as Ore Mining
Mining Unit Plant Consisting of screening equipment.	a) Remain on the mining excavation floor close to the active mine face. b) Spray bars are used for dust suppression of dust from the Mining Unit Plant c) Ore is slurried within the liquefier chute prior to pumping from the Mining Unit Plant to the wet concentration plant.	
WWTP1 and WWTP2	a) Pump pits transferring sewage to the plants are controlled by pre-set level floats. b) Each balance tank of WWTP1 and WWTP2 has sufficient capacity to contain peak flows over 12 hours. c) Flow meters on the WWTP1 and WWTP2 outlets to the irrigation spray fields monitor volumes discharged to irrigation spray fields. d) Sludge from WWTP1 and WWTP2 is removed annually, or as required and disposed of at a registered waste site by an approved contractor. e) Visual inspections daily when in operation to check the integrity of the tanks, pipelines, flow meters, alarm system (audible and visual) and stormwater drainage infrastructure.	Schedule 1, Figure 2 – Areas marked as WWTP 1, WWTP 2, Spray field 1 and spray field 2
Irrigation spray fields of WWTP1 and WWTP2	a) The spray field irrigation area includes a 5m buffer beyond the extent of the sprinklers range. b) Irrigation via the spray irrigator to be even and spray irrigators operate as per manufacturers specification. c) The fence around entire perimeter of spray field is maintained. d) Irrigation must be managed to prevent ponding of effluent on the ground surface of the spray field.	

	<ul style="list-style-type: none"> <li>e) Irrigation operations must not occur during significant rainfall events.</li> <li>f) Irrigation spray field of WWTP1 should not be less than 7.2 hectares in size and irrigation spray field of WWTP2 should not be less than 0.7 hectares in size.</li> <li>g) Visual inspections daily when in operation to check the integrity of the irrigation system valves, pumps, pipelines and other fittings</li> </ul>	
Landfill	<ul style="list-style-type: none"> <li>a) Area of landfill must be no more than 240 m x 340 m.</li> <li>b) Landfill area is surrounded by a maintained fauna proof fence.</li> <li>c) Each active cell is no more than 40 m long, 20 m wide and 4 mbgl.</li> <li>d) Depth of any cell must not exceed 4 mbgl</li> <li>e) Each active cell is to be surrounded by a bund 1 m high.</li> <li>f) A ramp will be made within each active cell to allow access to the floor of the cell.</li> <li>g) Waste will be deposited in the base of the cell, covered and compacted fortnightly, or prior to additional waste being deposited, whichever is soonest.</li> </ul>	Schedule 1, Figure 1 – Area marked as Landfill
Bioremediation facility	<ul style="list-style-type: none"> <li>a) A competent HDPE lining is maintained for each cell.</li> <li>b) The side walls must be maintained at 1m high.</li> <li>c) An earthen bund of 0.5 m high must be maintained at the front and rear of the cells</li> <li>d) Contaminated material must be treated and retained in the bioremediation facility until the treated material meets Total Recordable Hydrocarbon (TRH) results below the commercial Ecological Investigation Limits, NEPM (Assessment of Site Contamination).</li> <li>e) If the above limits are not met disposal must be by a licensed Controlled Waste carrier and according to Controlled Waste Regulations 2004.</li> </ul>	Schedule 1, Figure3– area marked as Bioremediation Facility

## Emissions and discharges

### Disposal of wastewater via irrigation

- The licence holder must ensure that treated wastewater is only discharged via irrigation to the specified discharge point in Table 2 and in accordance with the limits specified in Table 2.

**Table 2: Irrigation emission limits**

Discharge point	Parameter	Concentration limit	Loading limit
Sprinklers located within irrigation spray fields 1 and 2 (as shown in Schedule 1, Figure 2 – Areas marked as spray field 1 and spray field 2)	Total nitrogen	20 mg/L	180.0 kg/ha/yr
	Total phosphorus	2.0 mg/L	20.0 kg/ha/yr
	Biochemical oxygen demand	<20 mg/L	-

### Discharge to putrescible landfill

3. The licence holder must ensure that, where waste types produced on the premises are not taken offsite for lawful use or disposal, they are disposed of on the premises in accordance with the quantity limit and disposal location specified in Table 3.

**Table 3: Discharge to landfill**

Waste type	Quantity limit	Disposal location
a) Clean fill b) Inert waste type 1 c) Putrescible wastes d) Inert waste type 2 (not including tyres)	Sum of all waste types no more than 1,100 tonnes per annual period	Area marked as landfill in Schedule 1, Figure 1
e) Hydrocarbon contaminated soils	No more than 625 m <sup>3</sup> per cell	Schedule 1, Figure 3: Bioremediation facility within landfill

### Monitoring

4. The licence holder must monitor emissions:
- (a) from each discharge point;
  - (b) at the corresponding monitoring location;
  - (c) for the corresponding parameter;
  - (d) at the corresponding frequency;
  - (e) for the corresponding averaging period;
  - (f) in the corresponding unit; and
  - (g) using the corresponding method
- as set out in Table 4.

**Table 4: Emissions and discharge monitoring**

Discharge point	Monitoring location	Parameter	Frequency	Averaging period	Unit	Sampling Method
Sprinklers located within irrigation spray fields 1 and 2 (as shown in Schedule 1, Figure 2 – Areas marked as spray field 1 and spray field 2)	WWTP 1 and WWTP 2 flowmeters	Cumulative volume of water discharged to spray field	Continuous	-	m³/day	-
	WWTP 1 and WWTP 2 Irrigation tank outlets	<i>E.coli</i>	Monthly	Spot sample	cfu/100 mL	AS/NZS 5667.1 AS/NZS 5667.10
		Biochemical oxygen demand (BOD)			mg/L	
		Total nitrogen				

Discharge point	Monitoring location	Parameter	Frequency	Averaging period	Unit	Sampling Method
		Total phosphorus				
		Total suspended solids				
		pH <sup>1</sup>			-	

Note 1: In-field non-NATA accredited analysis permitted.

5. The licence holder must record the results of all monitoring activity required by condition 4.

## Records and reporting

6. The licence holder must record the following information in relation to complaints received by the licence holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:
- (a) the name and contact details of the complainant, (if provided);
  - (b) the time and date of the complaint;
  - (c) the complete details of the complaint and any other concerns or other issues raised; and
  - (d) the complete details and dates of any action taken by the licence holder to investigate or respond to any complaint.
7. The licence holder must:
- (a) undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and
  - (b) prepare and submit to the CEO by no later than 60 days after the end of that annual period an Annual Audit Compliance Report in the approved form.
8. The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:
- (a) the calculation of fees payable in respect of this licence;
  - (b) the works conducted in accordance with condition 1 of this licence;
  - (c) any maintenance of infrastructure that is performed in the course of complying with condition 1 of this licence;
  - (d) monitoring programmes undertaken in accordance with condition 4 of this licence; and
  - (e) complaints received under condition 6 of this licence.
9. The books specified under condition 8 must:
- (a) be legible;
  - (b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;

- (c) be retained by the licence holder for the duration of the licence; and
- (d) be available to be produced to an inspector or the CEO as required.

## Definitions

In this licence, the terms in Table 5 have the meanings defined.

**Table 5: Definitions**

Term	Definition
ACN	Australian Company Number
AHD	Australian Height Datum
Annual Audit Compliance Report (AACR)	means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website).
annual period	a 12-month period commencing from 14 December until 13 December of the immediately following year.
AS/NZS 5667.1	means Australian Standard <i>AS/NZS 5667.1 Water quality - Sampling - Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples</i>
AS/NZS 5667.10	means Australian Standard <i>AS/NZS 5667.10 Water quality - Sampling, Part 10: Guidance on sampling of waste waters</i>
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer of the Department. "submit to / notify the CEO" (or similar), means either: Director General Department administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC WA 6919 or: <a href="mailto:info@dwer.wa.gov.au">info@dwer.wa.gov.au</a>
cfu	colony-forming unit
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
EP Regulations	<i>Environmental Protection Regulations 1987</i> (WA)
HDPE	high density polyethylene



Term	Definition
kg/ha/yr	kilogram per hectare per year
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within.
licence holder	refers to the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted.
m <sup>3</sup> /day	metres cubed per day
mbgl	metres below ground level.
mg/L	milligrams per litre
monthly period	means a one-month period commencing from day 2 of a month until day 1 of the immediately following month.
NEPM	means National Environment Protection Measure.
premises	refers to the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map Figure 1 in Schedule 1 to this licence.
prescribed premises	has the same meaning given to that term under the EP Act.
waste	has the same meaning given to that term under the EP Act.
WWTP	wastewater treatment plant

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**END OF CONDITIONS**

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is shown in the map below (Figure 1).

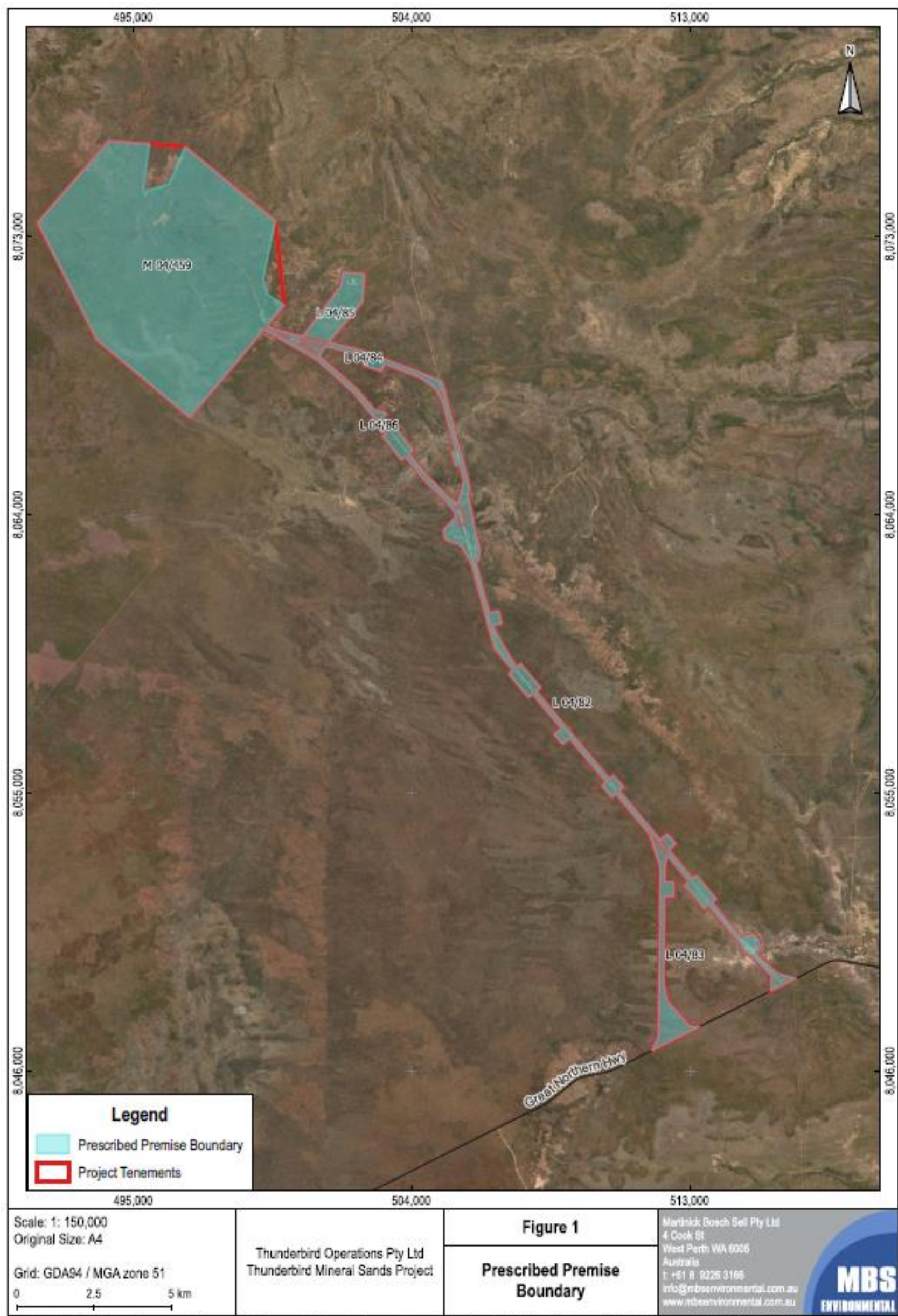


Figure 1: Map of the boundary of the prescribed premises



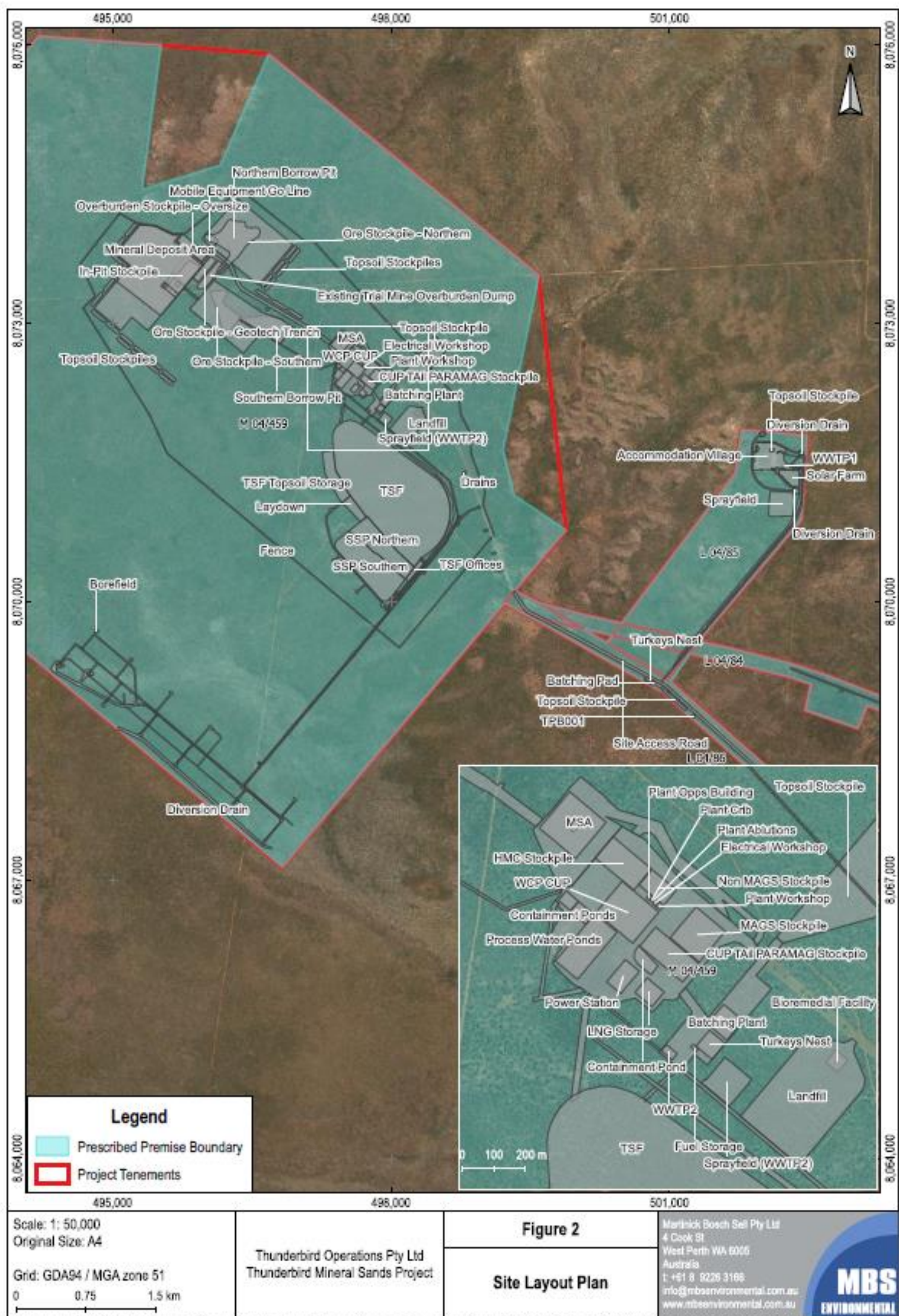


Figure 2: Site Layout plan



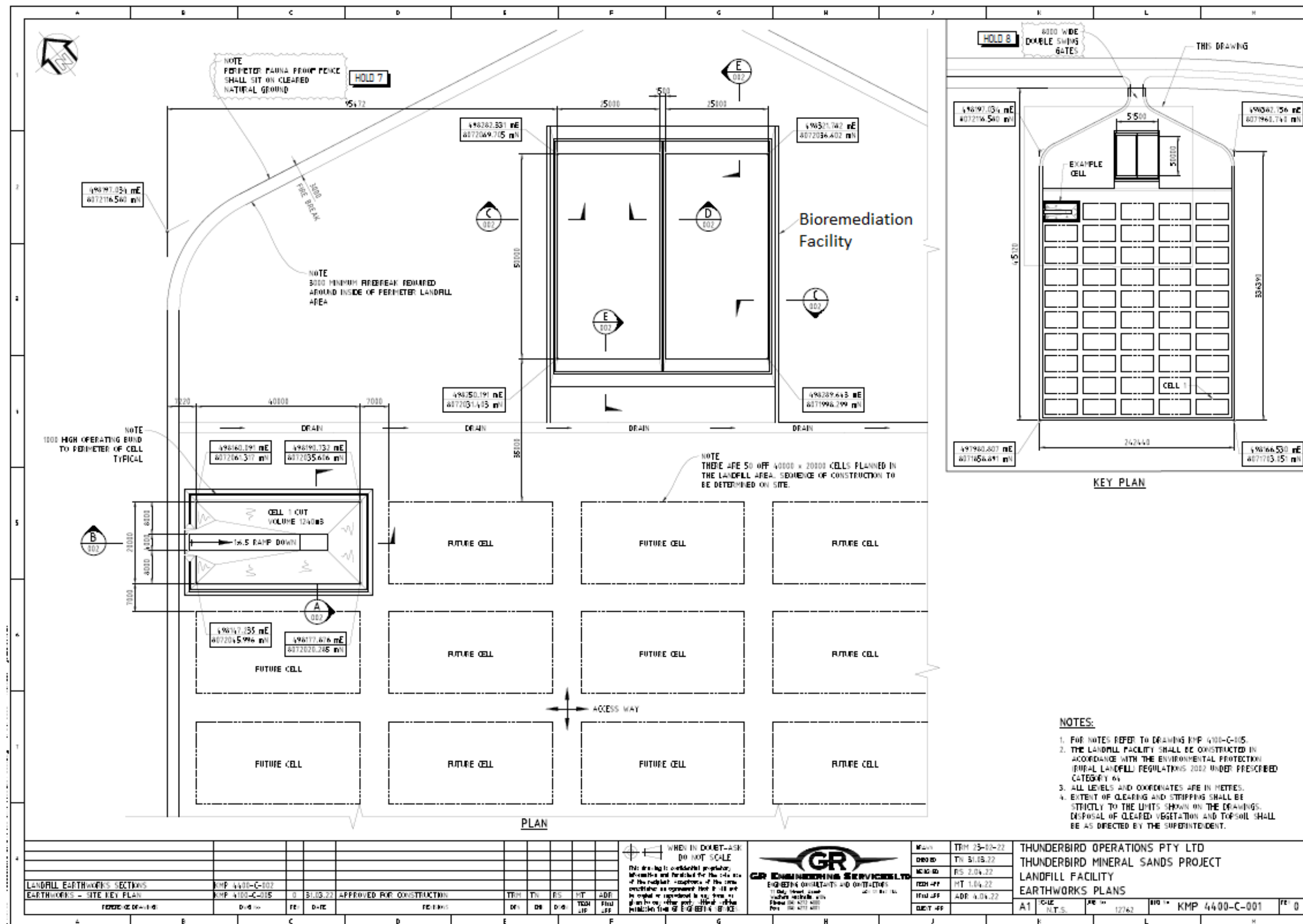


Figure 3: Bioremediation facility layout

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IR-T06 Licence template (v6.0) (February 2020)

## Schedule 2: Premises boundary

The corners of the premises boundary are the coordinates listed in Table 6.

**Table 6: Premises boundary coordinates (GDA94)**

M04/459		
Easting	Northing	Zone
499220.451	8069978.937	51
499221.644	8069980.357	
499221.469	8069980.45	
499221.451	8069980.488	
496830.05	8067135.029	
495316.025	8074443.065	
496156.524	8074704.09	
499207.899	8071633.137	
499327.971	8071147.632	
499885.003	8070770.029	
499336.715	8070117.637	
499336.778	8070117.642	

L04/84		
Easting	Northing	Zone
501669.861	8069496.857	51
502293.331	8069340.007	
502667.951	8069218.807	
504339.001	8068574.127	
504956.351	8068332.767	
504905.641	8068050.937	
505072.501	8068085.137	
503030.231	8068632.717	
502519.681	8069108.817	
502274.831	8069190.217	
505000.811	8067665.287	
504297.151	8068429.287	
503132.041	8068876.757	
503030.231	8068632.717	
500083.975	8069702.608	

L04/83		
Easting	Northing	Zone
512320.691	8053152.097	51
512279.963	8052966.626	
512198.001	8052593.367	
512193.431	8052107.147	
512479.121	8051627.977	
512188.931	8051627.977	
512183.601	8051061.557	
512161.691	8048819.657	
512287.241	8048251.287	
513016.861	8047434.128	

L04/85		
Easting	Northing	Zone
501705.727	8071391.593	51
501322.977	8069577.624	
501321.919	8069576.124	

L04/86		
Easting	Northing	Zone
505408.711	8064077.757	51
503675.541	8065767.617	
503057.141	8066553.487	
503177.611	8066648.287	
502124.581	8067952.977	
499601.891	8069776.707	
501013.205	8069138.298	
502224.371	8068065.487	
502838.061	8067348.997	
503100.101	8067330.147	
503031.991	8067107.747	
503312.561	8066754.477	
503450.071	8066862.677	
503934.481	8065971.397	
504493.411	8065267.627	
505194.241	8064571.947	
505492.985	8064346.815	

L04/82		
Easting	Northing	Zone
510616.221	8054959.387	51
509118.681	8056755.117	
507921.411	8058190.777	
505599.771	8062998.727	
505133.031	8067755.117	
505444.891	8066569.977	
505571.231	8066100.557	
505698.781	8065636.177	
505837.471	8065130.947	
505878.071	8064846.767	
505850.831	8064558.237	
506066.581	8063437.097	
506216.681	8062934.027	
506188.061	8062549.497	
506086.991	8062438.957	
506523.771	8060807.217	
506921.201	8060478.827	
506633.381	8060400.917	
506955.971	8059786.177	
507395.951	8059054.237	
508171.061	8058398.047	
508036.321	8058286.177	
510407.581	8055442.007	
510864.771	8055178.507	
510727.881	8055057.827	
512047.574	8053474.94	
512549.201	8053340.157	
512320.691	8053152.097	
513093.011	8052218.407	
513860.001	8051555.467	
513730.391	8051447.847	
513993.101	8051130.247	
514650.761	8050322.218	
515219.561	8050280.288	
515298.051	8049975.998	
515183.011	8049782.458	
515823.251	8049144.827	
515047.531	8049679.227	
513615.431	8051352.407	
505492.985	8064346.815	
505551.741	8065602.817	
505000.811	8067665.287	

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