BROMELTON COMPOST MANUFACTURING FACILITY

ENERGY CONCEPT REPORT

PREPARED BY:

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Document Details

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A	Issued for Information	N.S.	15.11.2024

Change Register

Section	Change	Reason For Change

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1.0 EXECUTIVE SUMMARY

The following report has been produced to investigate the proposed infrastructure for the Bromelton Compost Manufacturing Facility and produce commentary on the proposed upgrades required for the project. Based on the information provided, the scope of works is as follows:

- New sitewide point of supply
- New office building and parking facilities
- New internal roadway lighting
- Electrical supply to manufacturing equipment
    - Specific location, operating times & loads to be provided by the client and confirmed through a detailed design phase
- External distribution board with consideration for future connected electrical plant equipment

2.0 INTRODUCTION

The site is located on lot 4/RP85497 which is adjacent to Mitchell Road, Bromelton. Based on Energex online mapping there is an existing LV supply provided near the intersection of Mitchell Road / Beaudesert-Boonah Road, Energex pole P262280.

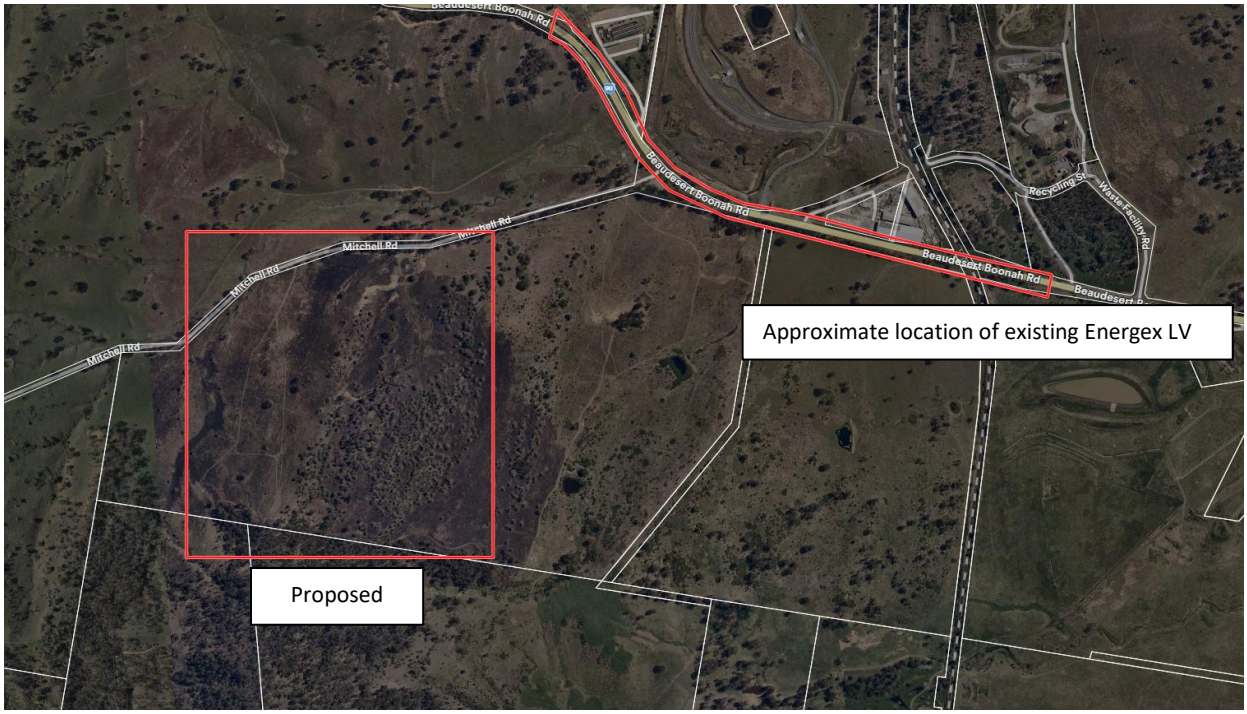


Figure 1 – Overview of site

An application has been placed with Energex for the supply of the site (Reference CX24BEA1117829Q) which is placed on hold until the DA conditions (and additional details) can be provided.

It should be noted that the proposed development and Michell Road has no point of supply. It is expected as part of the project (by others) the Energex network is to be extended along Mitchell Road.

3.0 ELECTRICAL SERVICES INFRASTRUCTURE

3.1 REQUIRED ELECTRICAL SUPPLY

Based on the maximum demand, a Padmount substation will be required. Refer to attached sketch, Appendix B, for an indicative location and Energex standard details around for sizing. Confirmation would be required from Energex regarding the earthing arrangement, for now a separate earthed substation is proposed. To further assist with location and sizing, the following information should be provided:

- Any Q100 flood levels of the site
- Hydrant locations to ensure minimum 10m separation in accordance with Energex standards
- Major electrical connections through the site
  - Potential cost savings could be achieved by moving the substation internal of the site
- Any known future electrical plant that would be proposed for the site
  - Including indicative locations due to the size of the site

It is logical to build a new site main switchboard adjacent to the Padmount substation to limit the length of consumers mains and provide a point of distribution to the proposed infrastructure. The maximum demand on the site main switchboard is expected to be 779 A/ph, including an allowance for 10% spare capacity. Downstream, low voltage switchboards shall provide protection and control for the equipment throughout the site.

4.0 MAXIMUM DEMAND

Refer to Appendix A for an estimated maximum demand and weekly energy consumption for the site, based on the equipment list provided from the client. The weekly energy consumption was calculated for general operating conditions (excluding public holidays). The maximum demand was calculated in accordance with AS/NZS 3000:2018 Table C2. The following assumptions were made:

- All equipment requires a three-phase supply
- Power factor of 0.98
- All equipment is operated at rated (maximum) capacity for the weekly duration specified in the table

Weekly Operating Hours[1] were determined from the information provided from the client. The proposed hours of operation for the site are shown in the following table:

Table 1: Proposed hours of operation (Site)

Day	Hours of Operation
Monday – Friday	6am to 6pm (12 hrs)
Saturday	6am to 4pm (10 hrs)
Sunday	9am to 4pm (7 hrs)

Below are the calculated hours of operation for the general layout of the site:

Load	Weekly Hours of Operation
FOGO Receival Equipment	12 hrs/day Monday to Friday + 10 hrs Saturday + 7 hrs Sunday = **77 hrs/week**
ASP Fans	24 hrs/day Monday to Sunday = **168 hrs/week**
General Power & Lighting: - FOGO Receival - Maintenance Shed - Offices/Amenities - Weighbridge	12 hrs/day Monday to Friday + 10 hrs Saturday + 7 hrs Sunday = **77 hrs/week**
Water Pumps	12 hrs/day Monday to Friday + 10 hrs Saturday + 7 hrs Sunday = **77 hrs/week**
Carpark & Internal Roadway Lighting	12 hrs/day (from dusk to dawn) Monday to Sunday = **84 hrs/week**

The loads mentioned would be further confirmed throughout a detailed design phase of the project, including more detailed analysis of operating loads throughout general production.

4.1 ENERGY EFFICIENCY

The following energy efficiencies should be prioritised through a detailed design phase to further assist with energy demand of the site:

- Soft starters and/or Variable Speed Drives (VSD) should be considered for large motors.
- Energy metering and monitoring must be carried out in accordance with the National Construction Code (NCC).
- All light fixtures should be LED
    - It is recommended to utilise occupancy detection and/or daylight harvesting to mitigate lighting outside operation hours.

5.0 CONCLUSION

The electrical infrastructure required for the Bromelton Compost Manufacturing Facility has been investigated. The key outcomes of the investigation are:

- There is currently no existing LV supply to the site
- Based on maximum demand calculations, a new Padmount substation will be required
- The expected maximum demand for the site is 779 A/ph
- The worst-case weekly energy consumption is expected to be 42577 kWh/week
- Energy efficiency controls should be considered to mitigate weekly energy consumption

All data within this report is preliminary and would be further confirmed throughout a detailed design phase.

6.0 APPENDIX A

Find Appendix A attachment below.

EQUIPMENT NO.	EQUIPMENT TYPE	CONNECTION AREA	POWER (kW)	PHASES	MAXIMUM DEMAND CURRENT (A / ph) (AS/NZS 3000:2018 TABLE C2)	WEEKLY OPERATING HOURS[1]	WEEKLY CONSUMPTION (kWh)
CV-01A	CONVEYOR 1 - INFEED HOPPER A	FOGO RECEIVAL	2.5	3	4	77	193
CV-01B	CONVEYOR 1 - INFEED HOPPER B	FOGO RECEIVAL	1.25	3	2	77	96
CV-02	CONVEYOR 1 - INCLINE CONVEYOR	FOGO RECEIVAL	2.5	3	4	77	193
SC-01	TROMMERS SCREEN	FOGO RECEIVAL	10	3	15	77	770
CV-03	CONVEYOR 3 - OVERS/SORT CONVEYOR	FOGO RECEIVAL	2.5	3	4	77	193
MA-01	OVERBELT MAGNET	FOGO RECEIVAL	1.25	3	2	77	96
LS-01	LIGHTS RECOVERY SEPARATOR	FOGO RECEIVAL	15	3	23	77	1155
CV-04	SHREDDER FEED CONVEYOR	FOGO RECEIVAL	2.5	3	4	77	193
SH-01	SHREDDER - E50 OR SIMILAR	FOGO RECEIVAL	280	3	413	77	21560
CV-05	FINES TRANSFER CONVEYOR 1	FOGO RECEIVAL	2.5	3	4	77	193
CV-06	FINES TRANSFER CONVEYOR 2	FOGO RECEIVAL	2.5	3	4	77	193
CV-07	SHREDDER UNDERS CONVEYOR	FOGO RECEIVAL	2.5	3	4	77	193
FA-01	ASP FAN 1	ASP	41.25	3	61	168	6930
FA-02	ASP FAN 2	ASP	27.5	3	41	168	4620
-	FOGO RECEIVAL	FOGO RECEIVAL	14	3	20	77	1078
-	MAINTAINANCE SHED	MAINTAINANCE SHED	14	3	20	77	1078
-	OFFICE FIT-OUT	OFFICE/AMENITIES	14	3	20	77	1078
-	CARPARK LIGHTING	OFFICE/AMENITIES	3	3	5	84	252
-	INTERNAL ROADWAY LIGHTING	SITEWIDE	7	3	10	84	588
-	WEIGHBRIDGE	SITE ENTRY ROAD	3	1	15	77	231
-	WATER PUMPS	LEACHATE POND FOGO LEACHATE POND MANUF. LEACHATE POND GO FRESHWATER DAM	22	3	33	77	1694
		TOTAL MAXIMUM DEMAND (A / ph)			**708**	**TOTAL WEEKLY CONSUMPTION (kWh)**	**42577**
		TOTAL + 10% SPARE CAPACITY (A / ph)			**779**		

7.0 APPENDIX B

Find Appendix B attachment below.

BROMELTON COMPOST MANUFACTURING FACILITY

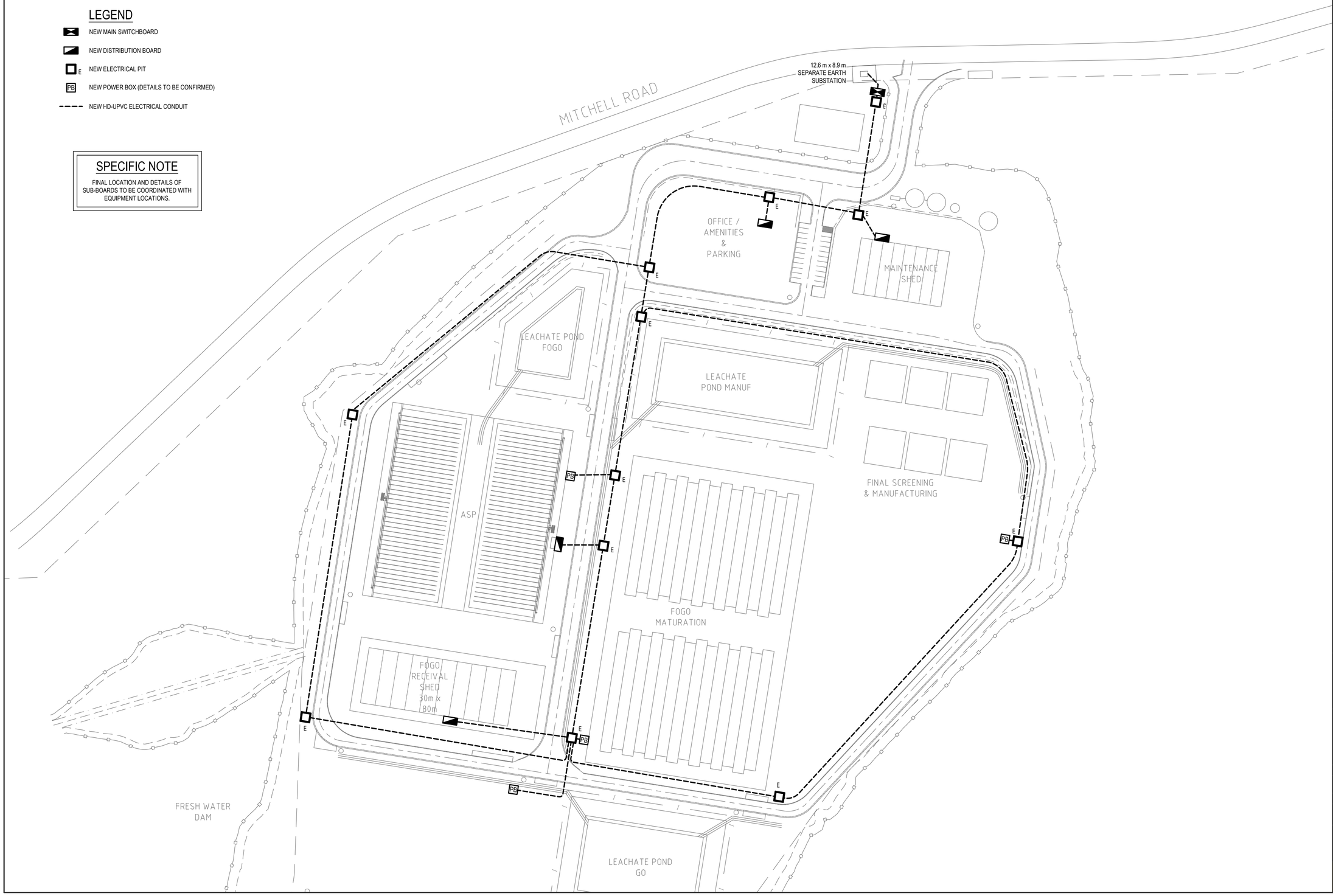
ELECTRICAL SERVICES

LEGEND

- NEW MAIN SWITCHBOARD
- NEW DISTRIBUTION BOARD
- E — NEW ELECTRICAL PIT
- PB — NEW POWER BOX (DETAILS TO BE CONFIRMED)
- NEW HD-UPVC ELECTRICAL CONDUIT

SPECIFIC NOTE

FINAL LOCATION AND DETAILS OF SUB-BOARDS TO BE COORDINATED WITH EQUIPMENT LOCATIONS.



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AMENDMENTS

ISSUE	DATE	AMENDMENT
A	28.06.24	FOR INFORMATION
B	08.08.24	FOR INFORMATION

CLIENT

PROJECT
BROMELTON COMPOST MANUFACTURING FACILITY

DRAWING
ELECTRICAL SERVICES
SITE PLAN

SCALE @ A1	DRAFTED	DESIGNED	REVIEWED	APPROVED
N.T.S.	K.B.	N.S.	N.S.	N.S.

PROJECT No.	DRAWING NUMBER	REVISION
R868A	SK01	B

NORTH POINT

PROJECT STATUS
INFORMATION

DRAWINGS INCLUDE COLOUR INFORMATION. A BLACK AND WHITE COPY MAY NOT HAVE ALL THE INFORMATION. THIS BACKGROUND IS COLOURED BLUE