

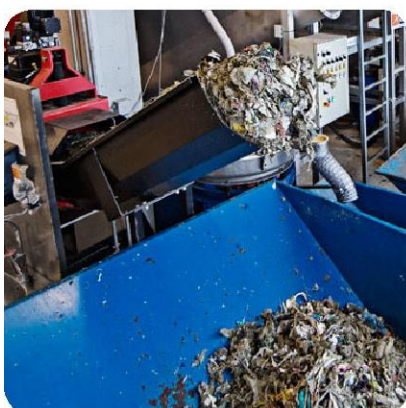
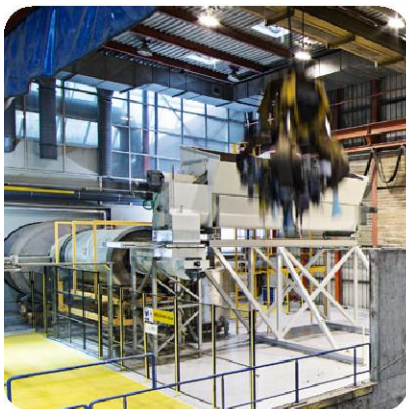


REnescience®

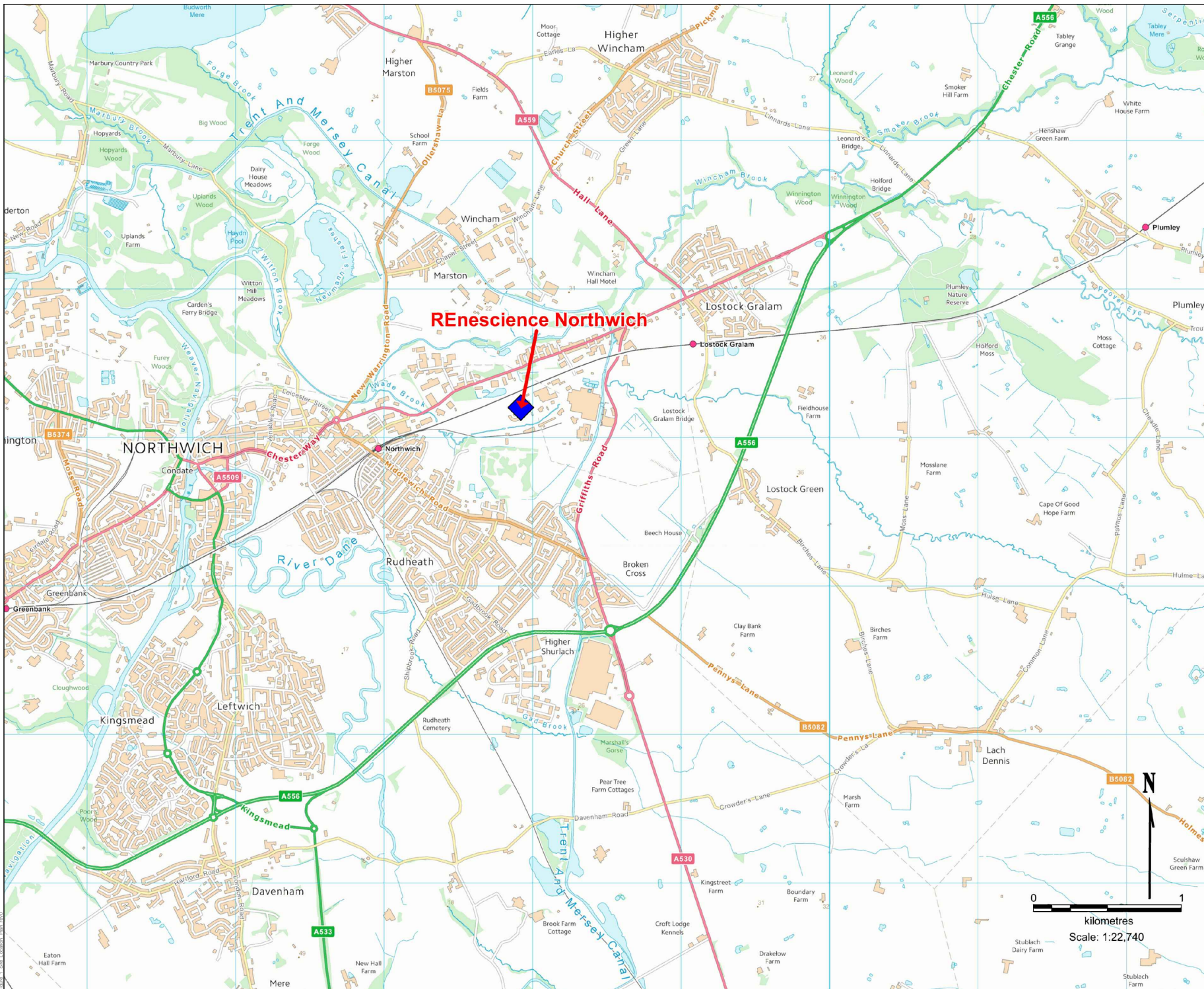


REnescience Northwich

Appendix B: Figures



Successful Partners
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6-7 Lovers Walk, Brighton, BN3 3BE
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Client **DONG ENERGY RENESCENCE NORTHWICH O&M LIMITED**

Project **REnescence Northwich Bioresource Project**

Title **Site Location Plan**

Date Created **Nov 2015** Drawn By **CP** PM/Checked by **JS**

Job Ref **JAS8407** Permit Application **EPR-VP3338RD**

Figure Number **Figure 1** Rev **0**





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- Legend**
- Permit Boundary
- Equipment Key:**
- | Equipment | Description |
|-----------|------------------------------------|
| BRT | Bioliquld reception tank |
| BRetT | Bioliquld retention tank |
| BDT | Biogas digester tank |
| HT | Hygeinisation tank (optional) |
| CD | Containerised de-gritter (cyclone) |
| PD | Post digester with gas storage |
| BDe | Biogas desulphuriser |
| BDr | Biogas dryer |
| BP | Biogas Polisher |
| CHP | CHP containers |
| GES | Gas engine stack |
| BH | Biogas holder (optional) |
| BFS | Biogas flare stack |
| DD | Digestate dewatering |
| RWT | Reject water tank |
| WCU | Water cleaning unit |
| PH | Pumping hub (containerised) |
| SB | Startup Boiler |

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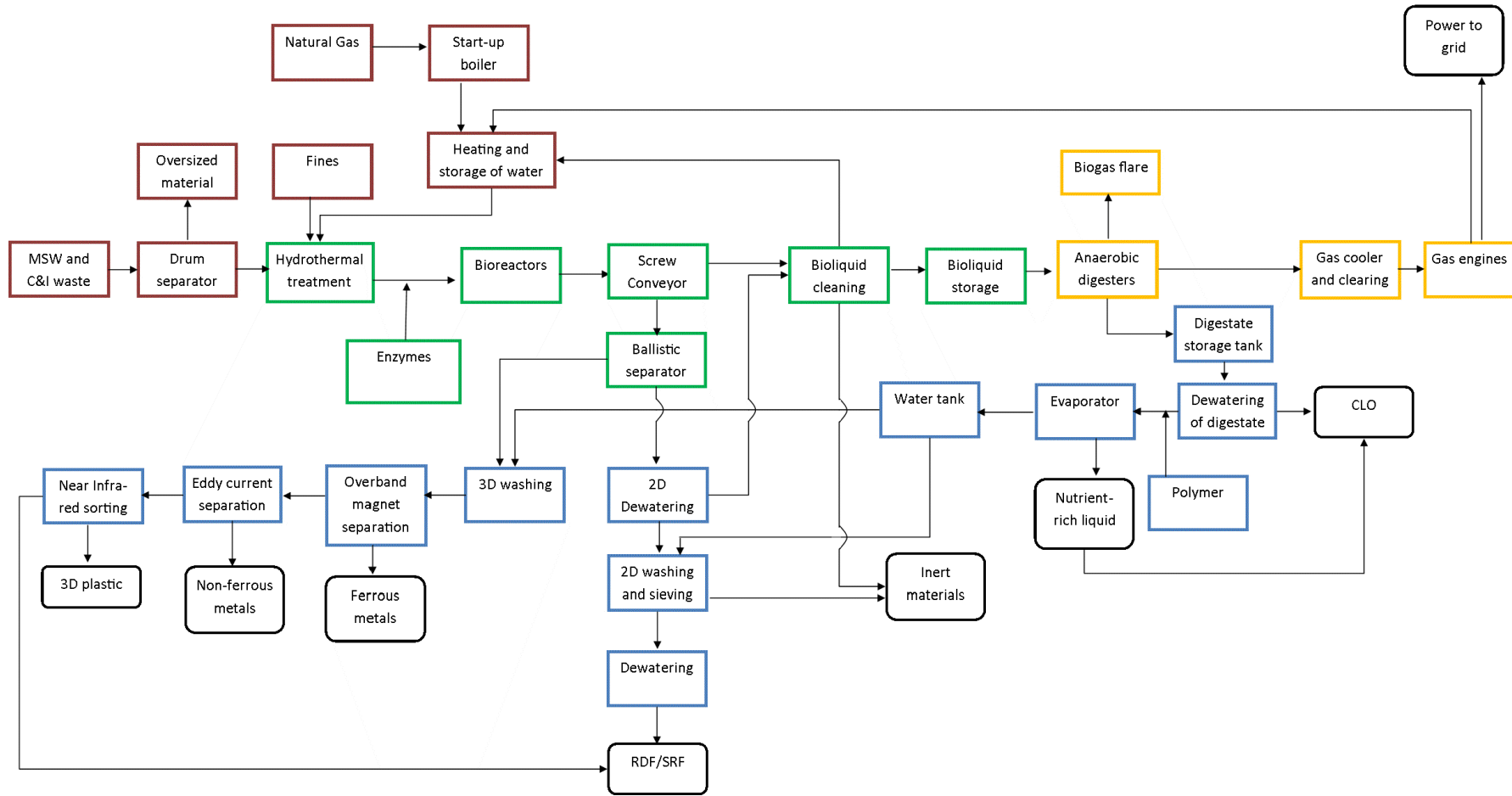
Project **Renescence Northwich Bioresource Project**

Title **Installation Boundary**

Date Created **Nov15** Drawn By **CP** PM/Checked By **JS**

Job Ref. **JAS8407** Permit Application **EPR-VP3338RD**

Figure Number **Figure 2** Rev **0**



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- Legend**
- Input waste sorting
 - REnescience process
 - Electricity generation
 - Waste washing and sorting
 - Material outputs

MSW - Municipal Solid Waste
 C&I - Commercial and Industrial
 CLO - Compost-like output
 RDF - Refuse Derived Fuel
 SRF - Solid Recovered Fuel

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Client **DONG ENERGY RENESCENCE NORTHWICH O&M LIMITED**

Project **REnescence Northwich Bioresource Project**

Title **Process Flow Diagram**

Date Created **Nov 15** Drawn By **CP** PM/Checked By **JS**

Job Ref. **JAS8407** Permit Application **EPR-VP3338RD**

Figure Number **Figure 3** Rev **2**



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Legend
 A1 - Gas Engine Stack
 A2 - Flare Stack
 A3 - Start-up Boiler Stack

Equipment Key:

Equipment	Description
BRT	Bioliqid reception tank
BRetT	Bioliqid retention tank
BDT	Biogas digester tank
HT	Hygeinisation tank (optional)
CD	Containerised de-gritter (cyclone)
PD	Post digester with gas storage
BDe	Biogas desulphuriser
BDr	Biogas dryer
BP	Biogas Polisher
CHP	CHP containers
GES	Gas engine stack
BH	Biogas holder (optional)
BFS	Biogas flare stack
DD	Digestate dewatering
RWT	Reject water tank
WCU	Water cleaning unit
PH	Pumping hub (containerised)
SB	Startup Boiler

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Client **DONG ENERGY RENESCENCE NORTHWICH O&M LIMITED**

Project **Renescence Northwich Bioresource Project**

Title **Site Layout Plan Indicating Emission Points**

Date Created **Nov15** Drawn By **CP** PM/Checked By **JS**

Job Ref **JAS8407** Permit Application **EPR-VP3338RD**

Figure Number **Figure 4** Rev **0**



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Legend

Equipment	Description
BRT	Bioliq uid reception tank
BReT	Bioliq uid retention tank
BDT	Biogas digester tank
HT	Hygeinisation tank (optional)
CD	Containerised de-gritter (cyclone)
PD	Post digester with gas storage
BDe	Biogas desulphuriser
BDR	Biogas dryer
BP	Biogas Polisher
CHP	CHP containers
GES	Gas engine stack
BH	Biogas holder (optional)
BFS	Biogas flare stack
DD	Digestate dewatering
RWT	Reject water tank
WCU	Water cleaning unit
PH	Pumping hub (containerised)
SB	Startup Boiler
	Application Boundary

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Project **REnescence Northwich Bioresource Project**

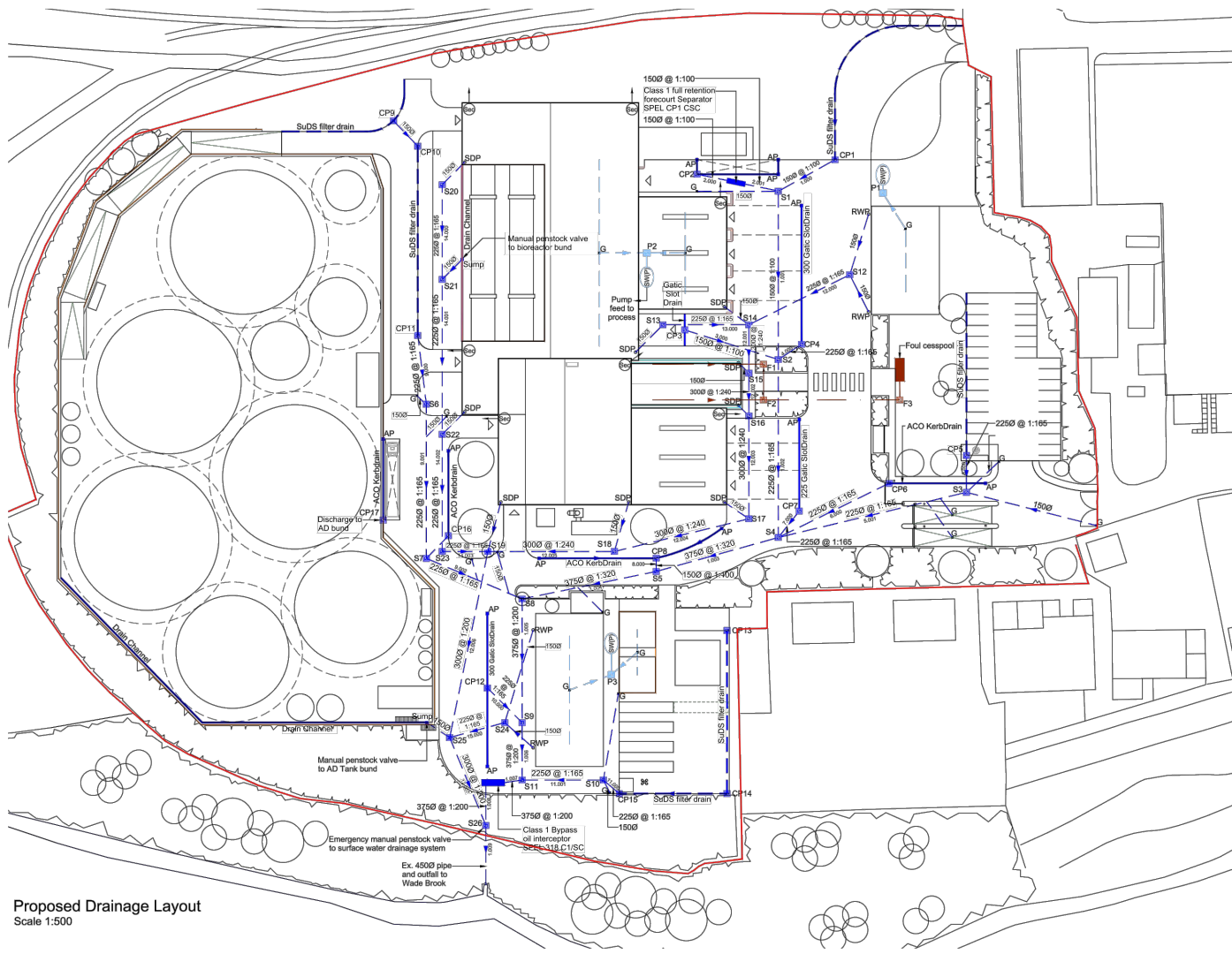
Title **Site Layout Plan Indicating Material Storage Areas**

Date Created **Nov 2015** Drawn By **CP** PM/Checked By **JS**
 Job Ref. **JAS8407** Permit Application **EPR-VP3338RD**

Figure Number **Figure 5** Rev **0**

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Note:
All primary siphonic rainwater system downpipes to extend to first external manhole (within 10m of building)



Proposed Drainage Layout
Scale 1:500

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Key:

- 1500 @ 1/135 FW Sewer (ID & Gradient)
- 2250 @ 1/165 SW Sewer (ID & Gradient)
- F1 FW Manhole
- S2 SW Manhole
- P1 SW (Process Drainage)
- F14 Internal FW Manhole ($\le 150e$)
- F14 Internal FW Manhole (>150e)
- (10.00) (11.60) Backdrop Manhole (FW Illustrated)
- Slot Drain (with subsoil drain below)
- SuDS Filter Drain
- (11.60) SW Pumping Station with Inlet Invert
- (11.60) FW Pumping Station with Inlet Invert
- 2250 @ 1/165 SW HDPE Rising Main (OD & Gradient)
- 1500 @ 1/135 FW HDPE Rising Main (OD & Gradient)
- Trade Effluent (discharge to tank for offsite disposal)
- G Trapped Gully
- FG Trapped Floor Gully
- SVP Soil Vent Pipe
- AAV Air Admittance Valve
- DS Discharge Stack
- RWP Rainwater Pipe (c/w RE)
- SDP Siphonic Primary Downpipe
- SDP Siphonic Secondary Discharge
- RE Rodding Eye
- CL Cover Level
- CRL Crown Level
- SL Soft Level
- IL Invert Level
- BD Back Drop
- ID Internal Diameter
- CP Catch pit
- AP Access point
- Water retaining bund walls Designed to BS EN 1992-3
- (SWP) SW (Process) Water Containment Tank

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Project **Renescence Northwich Bioresource Project**

Title **Indicative Site Drainage Plan**

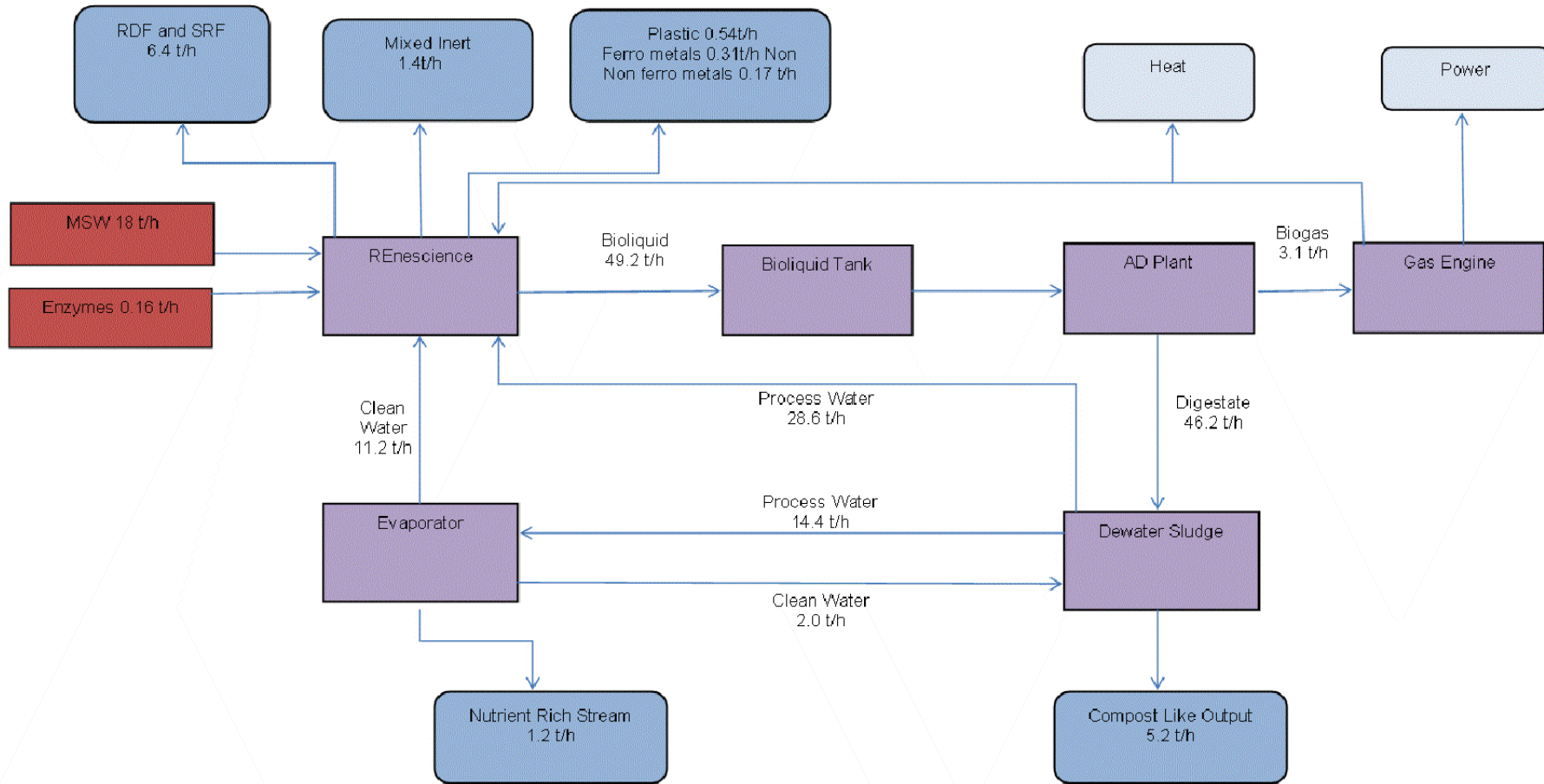
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Figure Number **Figure 6** Rev **0**



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- Legend**
- Process inputs
 - Facility processes
 - Recovered outputs
 - Process outputs



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Client **DONG ENERGY RENESCENCE NORTHWICH O&M LIMITED**

Project **REnescence Northwich Bioresource Project**

Title **Mass Balance Diagram**

Date Created **Nov 15** Drawn By **CP** PM/Checked By **JS**

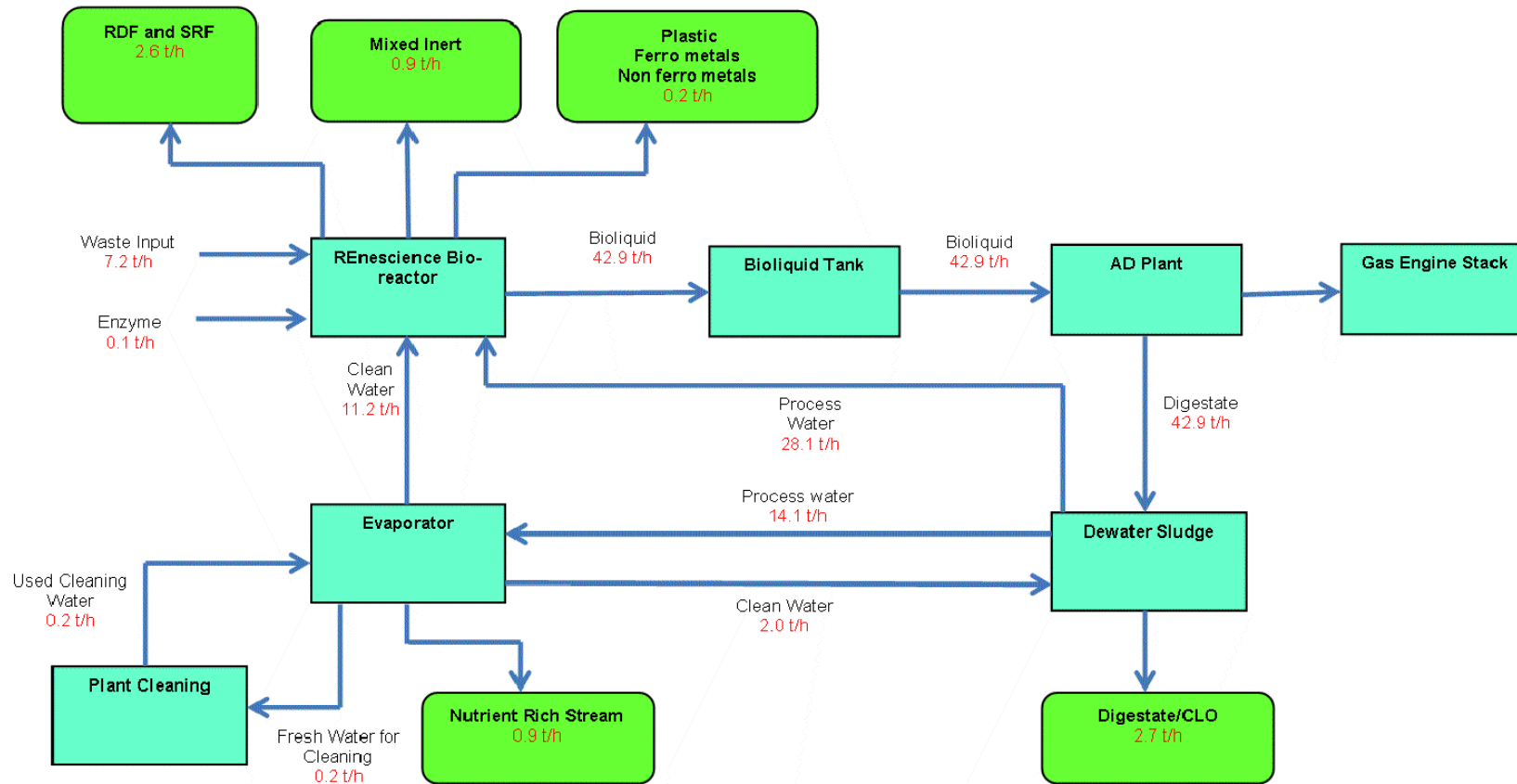
Job Ref **JAS8407** Permit Application **EPR-VP3338RD**

Figure Number **Figure 7** Rev **0**

Legend

- Facility process
- Process Outputs

Water Balance under Normal Operation



Water flows indicated in red text
(tonnes per hour (t/h))

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Client: DONG ENERGY RENESCENCE NORTHWICH O&M LIMITED

Project: REnescence Northwich Bioresource Project

Title: Water Balance Diagram

Date Created: Nov 15
 Drawn By: CP
 PM/Checked By: JS

Job Ref: JAS8407
 Permit Application: EPR-VP3338RD

Figure Number: Figure 8
 Rev: 0

Energy Balance Under Normal Operation

	Hourly					Annual based on 8000 hours per annum				
	Import KW per hour			Produced KW per hour		Import MWh			Produced MWh	
Power Usage	Electricity (grid)	Electricity (engines)	Heat	Electricity	Heat	Electricity (grid)	Electricity (engines)	Heat	Electricity	Heat
Waste reception and feed	119					952				
Bioreactor	122		360			976		2,880		
Bioliq uid cleaning	39					312				
2D separation	53					424				
3D separation	46					368				
Water loops	252		200			2,016		1,600		
AD plant	275		750			2,200		6,000		
Hygienisation of digestate	33		1,680			264		13,440		
Gas engines		40		6,345	3,830		320		50,760	30,640
Building and ventilation	185		200			1,480		1,600		
TOTAL	1,124	40	3,190	6,345	3,830	8,992	320	25,520	50,760	30,640

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Legend
Energy Input
Produced Energy Output

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Project **REnescence Northwich Bioresource Project**

Title **Energy Data**

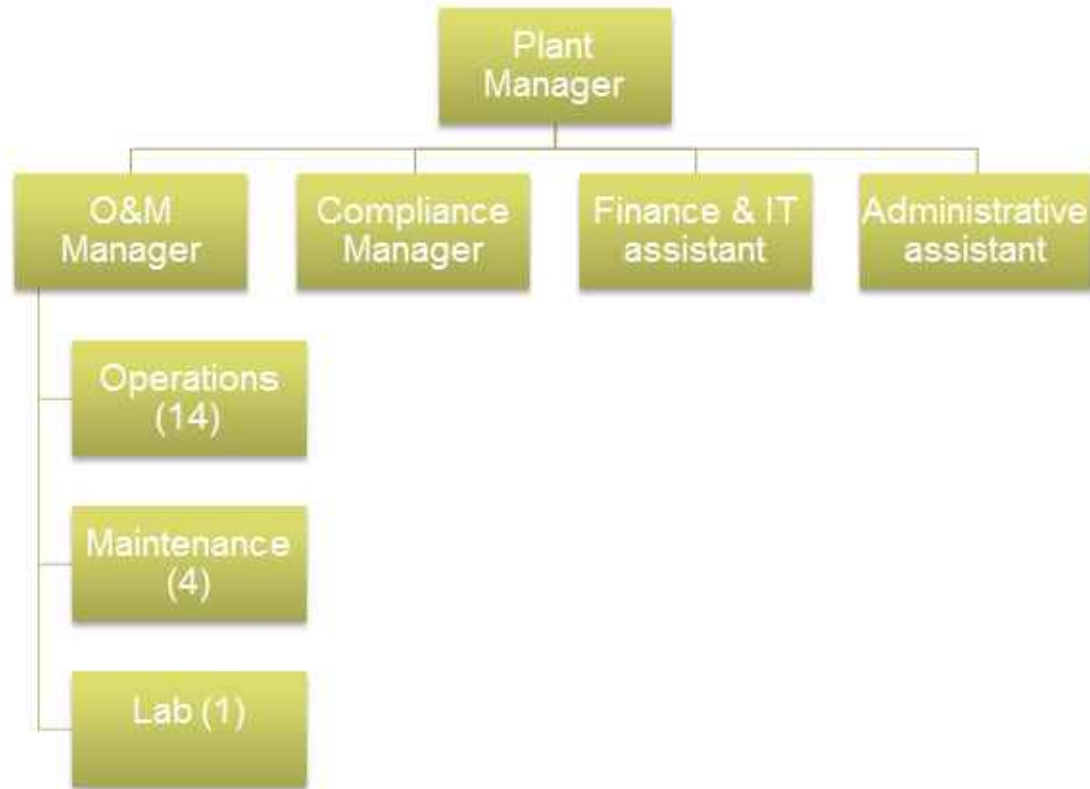
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Figure Number **Figure 9** Rev **0**

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Plant organisation



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Client **DONG ENERGY RENESCENCE NORTHWICH O&M LIMITED**

Project **Renescence Northwich Bioresource Project**

Title **Organisation Chart**

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Job Ref **JAS8407** Permit Application **EPR-VP3338RD**

Figure Number **Figure 10** Rev **1**

