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1. Safety

Any person carrying out any of the following instructions shall do so in accordance with United Utilities Ltd. Blue Book and all Generic Risk Assessments (GRAs), details of which are contained in United Utilities Ltd. Health and Safety Policy – Organisations and Arrangements document and available via the UU intranet site.

If in carrying out this instruction, it is not possible to rectify any problem encountered within a reasonable timescale, the Production Manager or senior equivalent person must be contacted.

All other applicable regulatory and statutory requirements shall be observed at all times.

Detailed operating instructions, control philosophies and technical information may be found in the following;

- **Process Loss Contingency Plans**
- **Compliance Action Plans**
- **Environmental Permits**
- **Accident, Incident and Emergency Management Plans**
- **Drainage Plans**
- **Environmental Risk Assessments**
- **O & M Manuals**
- **Control philosophies**

2. Responsibility

All Standard Operating Procedures, Instructions and other documented operational procedures and activities are to be carried out by the Process Controller or other trained person designated by the Production Manager.

If in carrying the instruction it is not possible to rectify any problem encountered within a reasonable timescale the Production Manager or senior equivalent person must be contacted.

Any operational problem that cannot be dealt with by normal operational procedures shall be classed as an INCIDENT and the current issue of UU Incident Management Procedure shall be referred to and SOP (WP/S/001/30/01 Incident Response).

All actions and communications carried out while applying any Standard Operating Procedure, Instruction or other documented operational procedure or activity shall be recorded using form WwP/F/001/31/08 Site Diary Log.


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3. Site Location

Ellesmere Port WwTW
A1157
Nr Little Stanney
CH2 4HZ

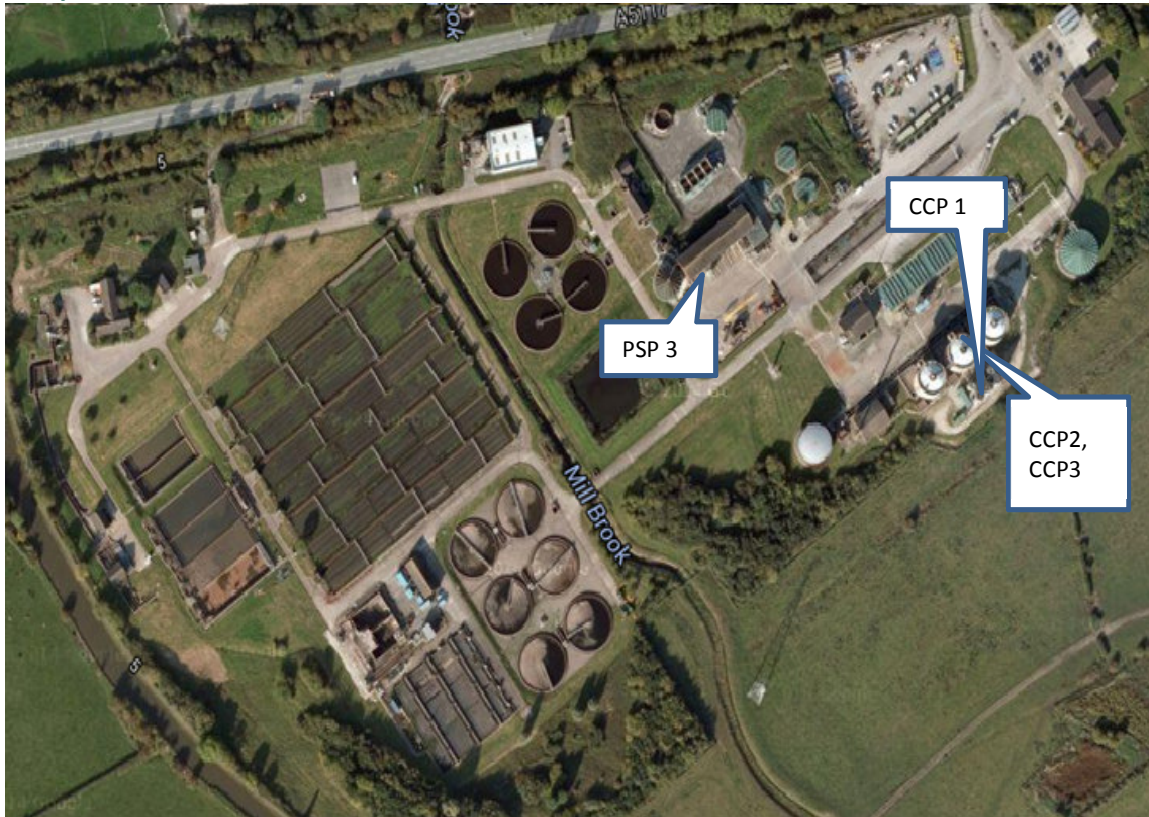
Processes In Use

- The Sludge Treatment Process at Ellesmere Port WwTW comprises of 3 No 120 m³ Thermophillic Aerobic Digesters (TADs) & 3 No.3, 370 m³ Mesophilic Anaerobic Digesters (MADs) Pathogen reduction is achieved by Thermophillic Aerobic Digestion followed Mesophilic Anaerobic Digestion.
- The main purpose of the TADs is to kill all pathogens thus producing an enhanced product, but due to a number of reasons the site struggles to produce an enhanced product and now treats to conventional standards.
- The MADs also reduce the fermentability of the sludge by converting a substantial proportion of organic matter to biogas.
- Refer to the Primary Digestion (WwP/I/3010/15/01) for a full description.
- Untreated or 'Raw' sludge is the indigenous sludge. A sample can be taken from one of the outlet bellmouths of any of the four PSTs MPID:3387
- Treated sludge (end product) is defined as sludge that has been through the process train and Centrifuged into a 'Sludge Cake' ready for disposal, a sample can be taken off one of the trailers in the bays below the Centrifuge MPID:209758
- The former end product was the liquid sludge out the MADs MPID 209952 this can now be used to assess performance.

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4. Site Plan

Sample Points



Key


PSP 3 Sampling point 3 Digested cake MPID 209758

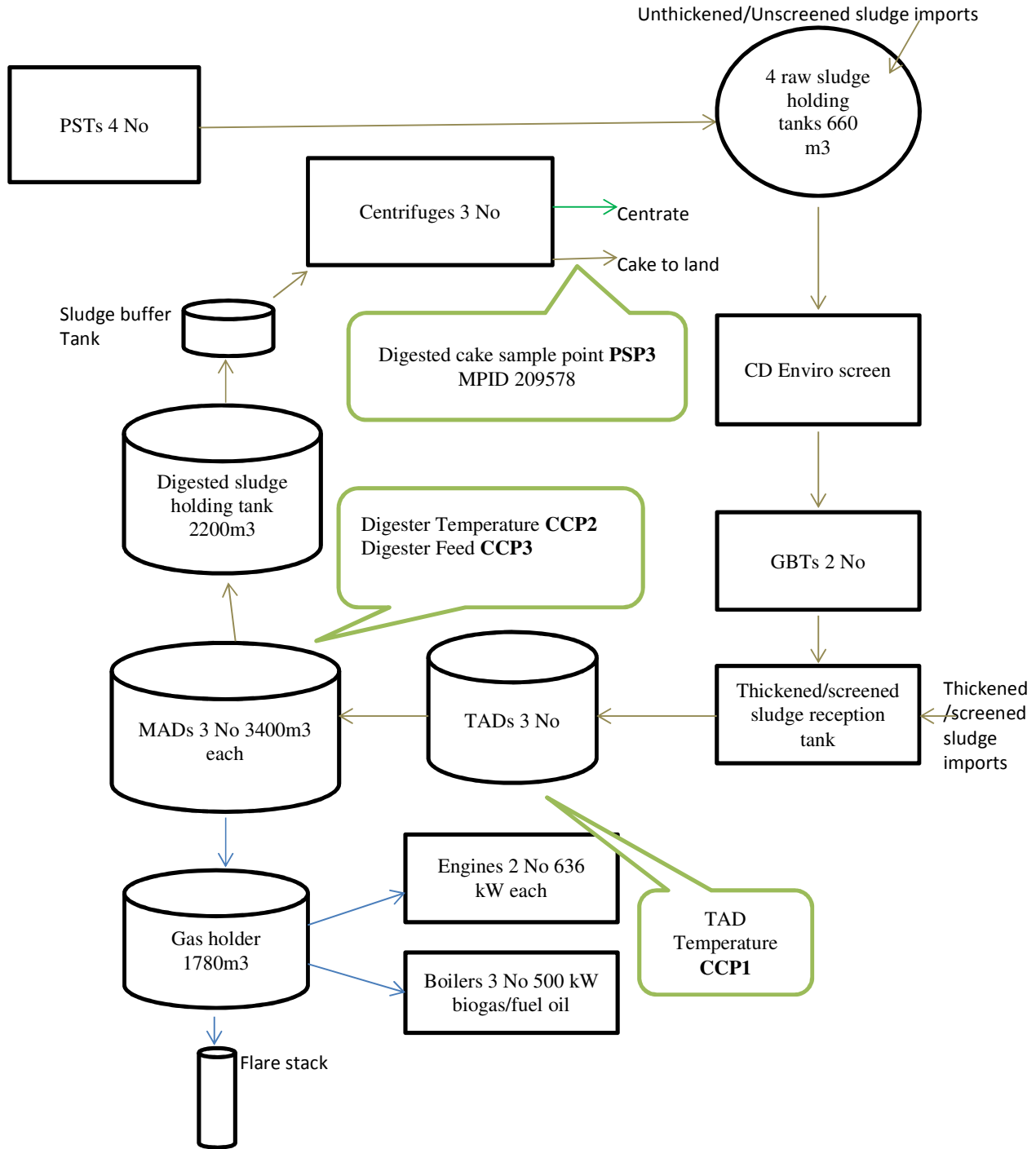
CCP1 TAD Temperature

CCP2 Digester Temperature

CCP3 Digester Feed

5. Process Schematic

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6. Critical Control Points & Process Sampling Points

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Critical Control Point (CCP)	Description	Critical Limit	Frequency of monitoring
CCP1	TAD temps & time	54C for minimum 45 minutes	Daily, Continuous and Automatic
CCP2	Digester 1 2& 3 temperature gauges are located in the limpets and at ground level on each MADs	29.7-°c	Daily, Continuous and Automatic
CCP3	Digester 1, 2 & 3 Feed which is displayed on the Digester MCC HMI & the SCADA	Maximum of 286 m3/d to each Digester	Daily, Continuous, Automatic

Asset codes for temperature probes	
TAD reactor No 1	ELLES-SL1-ST1-PDI01-CX001
TAD reactor No 2	ELLES-SL1-ST1-PDI02-CX001
TAD reactor No 3	ELLES-SL1-ST1-PDI03-CX001
MAD No 1 top	ELLES-SL1-ST1-PDI01-CX001
MAD No 1 bottom	ELLES-SL1-ST1-PDI01-CX002
MAD No 2 top	ELLES-SL1-ST1-PDI02-CX001
MAD No 2 bottom	ELLES-SL1-ST1-PDI02-CX001
MAD No 3 top	ELLES-SL1-ST1-PDI03-CX001
MAD No 3 bottom	ELLES-SL1-ST1-PDI03-CX002

Process Sampling Point (PSP) Description	MPID	NGR
PSP3 Treated Sludge Cake final product – Sample point direct from discharge shutes into the trailer	209758	SJ423000743000

7. Process Validation Data (Verification)

The table below shows the results of the sampling events of the process validation. It demonstrates that the sludge treatment process at this treatment works achieves a final product which meets the pathogen reduction and Maximum Admissible Concentration requirement of a **Conventionally** Treated biosolids product as defined by the ADAS Safe Sludge Matrix.



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Site	Ellesmere Port								
Process Validation Data									
Sample Event	Date	E.coli					Salmonella	Treated Mean	Kill
		Raw 3387	Raw log10	Raw Mean	Treated 209758	Treated log10			
1	14/05/2015	8680000	6.938519725	6.527531263	3.8	0.579783597	N/A	0.579783597	5.947747666
	14/05/2015	3170000	6.501059262		3.8	0.579783597	N/A		
	14/05/2015	1390000	6.143014800		3.8	0.579783597	N/A		
2	19/05/2015	1230000	6.089905111	6.146394213	3.6	0.556302501	N/A	0.571856277	5.574537936
	19/05/2015	1490000	6.173186268		3.9	0.591064607	N/A		
	19/05/2015	1500000	6.176091259		3.7	0.568201724	N/A		
3	28/05/2015	9920000	6.996511672	6.587129961	3.8	0.579783597	N/A	0.583543933	6.003586027
	28/05/2015	1060000	6.025305865		3.8	0.579783597	N/A		
	28/05/2015	5490000	6.739572344		3.9	0.591064607	N/A		
4	02/06/2015	7280000	6.862131379	6.60482767	15400	4.187520721	N/A	2.950155778	3.654671892
	02/06/2015	1130000	6.053078443		3.9	0.591064607	N/A		
	02/06/2015	7930000	6.899273187		11800	4.071882007	N/A		
5	05/06/2015	5940000	6.773786445	6.913970201	1010	3.004321374	N/A	2.742899675	4.171070525
	05/06/2015	9720000	6.987666265		127	2.103803721	N/A		
	05/06/2015	9560000	6.980457892		1320	3.120573931	N/A		



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Site		Ellesmere Port							
Process Validation Data									
		E.coli					Salmonella		
Sample Event	Date	Raw 3387	Raw log10	Raw Mean	Treated 209758	Treated log10		Treated Mean	Kill
6	08/06/2015	2430000	6.385606274	6.495021971	11200	4.049218023	N/A	3.362117855	3.132904116
	08/06/2015	1560000	6.193124598		1470	3.167317335	N/A		
	08/06/2015	8060000	6.906335042		741	2.869818208	N/A		
Duration	25 Days							Validation Mean	4.747419694
								Standard Achieved	Conventional

Operating conditions during validation process		
	Min	Max
TAD Temp	54°C	
TAD Feed		12

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Analytical Method in Use

The isolation and enumeration of *Escherichia coli* by either a chromogenic membrane filtration technique or defined substrate most probable number technique.
The detection of Salmonella spp. by use of a presence/absence technique.

Calculation of Results

For the method of calculation refer to the “Biosolids Assurance Scheme Standard 2015”, Management Control Method 2.4 parts e-g.

8. Routine Monitoring And Sample Storage

Sludge samples are taken from the designated sample points as marked on the site map, in line with the monitoring schedule. The monitoring schedule can be found in WwP/S/001/18/38 Sludge Process Monitoring.

The UU Laboratory scheduling system holds the sample programme to monitor for pathogen levels. Sampling Round sheets and labels are issued to site on green paper clearly marked Reg Sludge or HACCP. Samples for E.coli/Salmonella must be taken in the appropriate bottle type, which is available from the laboratory and is pre-sterilised to prevent contamination of the sample. Refer to WwP/S/001/18/36 Sludge Process Sampling Procedure.

Where possible the intended schedule date should be followed. The schedule date on the roundsheet is not restrictive, however the samples should be taken in the designated week, provided that the correct date and time are recorded in the available boxes.

All sludge process monitoring and verification samples are stored in the site sample storage fridge. Refer to WwP/S/001/18/37 Sludge Sample Storage and Transport. Samples are transferred from the storage fridge to standard issue grey lidded waste water crates to ensure minimum exposure to light.

For sampling for a verification or re-verification contact the Regulatory Services (Process) team who will liaise with the laboratory to arrange for roundsheets and labels for the correct analysis.

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9. Record Keeping

The table below details the location of records relating to all aspects of the use of HACCP procedures on site.

Record Type	Storage location	Storage duration
Pathogen Daily self-monitoring sheet	SharePoint	5 years
Routine sampling results	Operational Management System (OMS)	20 years
Fridge temperature monitoring sheets	Site files	3 years
Digester temperature Probe Maintenance	MAMS/MARS	5 years

10. Corrective Action Plan

CCP Critical Limit breach

Inform Agricultural Services of the CCP breach / loss of process immediately. Agricultural Services will assess the impact and implement site specific measures to deal with the potentially non-conforming product on site.

Commence daily sampling immediately following a CCP breach from the appropriate process sampling points to monitor for return to compliance.

Check OMS Daily for sampling results and continue to monitor CCPs until process returns to operating within the Critical Limits.

Routine Monitoring Maximum Allowable Concentration (MAC) Failure

MAC Failures are issued from the Laboratory as DataDesk consent failure notification emails. Check the complete set of results for the sample event in question and confirm that the mean of the log values exceeds the standard to which the site is verified.

Inform Agricultural Services of the MAC Failure / loss of process immediately.

Agricultural Services will assess the impact and implement site specific measures to deal with the potentially non-conforming product on site.

Commence daily sampling immediately following a MAC failure, from the appropriate process sampling points to monitor for return to compliance.

Check OMS Daily for sampling results and continue to monitor until process returns to compliance, as indicated by a passing MAC value from the daily sampling.

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In all instances where the site is performing in a manner which could potentially negatively impact biosolids conformity, sampling should continue until it can be demonstrated that the site is consistently producing conforming products.

For generic guidance on appropriate action to take in the event of abnormal performance of a sludge treatment process refer to WwP/S/001/18/28 HACCP Sludge Process Contingency Planning Procedure.

After returning the process to operating within the critical limits and obtaining sample passes for the Maximum Allowable Concentration (MAC) for the treatment standard to which the site is verified, update the corrective action log in the HACCP plan to reflect actions taken and the outcome.

11.Site Specific Corrective Actions


Problem/CCP Breach	Primary Corrective Action	Secondary Actions	Comments
Primary Digester Retention Time <12 days (Feed Volume > 286m ³ /digester/day)	Reduce feed volumes to increase retention time	Ensure sludge thickening plant is optimised to reduce volumes	Increase digester feed solids to a maximum of 6.0% Monitor organic loading max 2kgvs/m ³ of digester volume per day
		Export thickened sludge to other sites	Contact Agricultural Services for available capacity
		Install mobile centrifuge on thickened sludge and lime/landfill cake	Requires prior agreement with EA Contact local UU ERA for advice
Primary Digester temperature low <29.7°C	Increase temperature	Ensure heat output from CHP engines is maximised	Engines are serviced by Clarke Energy Ltd
		Fire boiler on bio gas/oil	The CHP engines should be used as the primary heat source where possible due to their greater efficiency

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		Increase feed solids (see above) to reduce water content and heat demand in digesters	See above
		Ensure feed volumes to each digester are equal	Check flow metering accuracy
		Increase TAD reactor minimum residence temp setting. Assess and optimise heat recovery times	Change parameters in a controlled method and assess
TAD temp below 54 °C	Ensure control parameters are set correctly		The plant is has a pre-set parameter so the plant will not process below 54 °C


12. Contacts in Case of Haccp Failure

Agricultural Services:	Dave Hindle	07771 598220
	Sidath Gedara	07899 815140
Regulatory Services:	Danni Jones	01925 678177

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13. Corrective Action Log

Ellesmere Port Wwtw Tick Sheet For Audit Trail In Case Of Haccp Failure		
Date:	Answer Yes/No	Comments On Ccp Failure And Action Taken
Did a CCP fail		<i>Which one and what did you do</i>
Have you informed the Sludge Recycling Team and your Production Manager?		
Are CHU/GDS above 100,000 before transfer to land?		<i>If YES Stop transfer, store and resample</i>
Is it possible to determine which cake is affected?		
Have all other CCP's been checked e.g. TAD temps/times MAD Temps, Maximum MAD Feed and Secondary Digester Retention Time?		
Have you had the affected sludge resample		<i>If the sludge falls below 100,000 CFU/GDS the sludge can now go to land, If the sample result is above 100,000 CFU/GDS continue to sample</i>
Have you made actions to bring failed CCP back into compliance		<i>Total boiler/engine failure consider boiler hire, record actions on HACCP daily monitoring</i>
Date CCP back in compliance		
Is Reverification required?		
Signature		
Name		

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14. Contacts

- Integrated Control Centre (ICC): 0345 050 9482
- Site Address: Ellesmere Port WwTW, A1157,
Nr Little Stanney, CH2 4HZ
Cheshire
- Operations Area: Cheshire
- Production Manager: Diane Mason: 07771 838229
- Technical Officer: Neil Wilkinson: 07712 774316
- Production Engineer: Gerald Mugisha: 07827 829160
- Process Controllers : Alex Ranley: 07717 228195
Heath Jones: 07500 849284
Jake Firth: 07990 801782
- Agricultural Services: Dave Hindle: 07771 598220
Sidath Gedara: 07899 815140