

# Standard Operating Procedure (SOP)

<b>Title</b>	Import, Dewatering and Storage of Digested Sludge and Digested Cake
<b>Site</b>	All Severn Trent Sites

<b>Purpose</b>	<ul style="list-style-type: none"> <li>To define procedure for the reception, dewatering and storage of imported digested liquid sludge at Severn Trent receiving sites.</li> <li>To define procedure for the reception, and storage of imported digested cake at Severn Trent receiving sites.</li> <li>To ensure that when sites are experiencing issues with digested liquid sludge or cake, the procedure ensures compliance with BAS</li> <li>To ensure the data for digested sludge is properly recorded.</li> </ul>
<b>Who</b>	<ul style="list-style-type: none"> <li>BR Process Optimisation team</li> <li>Site Operators &amp; Works Managers in Bioresources</li> <li>Biosolids Team</li> </ul>

## Must Have (H&S, Quality, Quantity, Environment, Training, Resources)

- Knowledge of understanding of BAS / HACCP.
- Knowledge of the HACCP plans for respective sites.
- Suitable competency for role (e.g. Tanker Driver, Operations Manager, etc)

**Remember – ‘Stop, Think, Take 20’**

## Summary Must Do’s

- all imported materials are managed in accordance with:
  - the Biosolids Assurance Scheme (BAS),
  - Sludge (Use in Agriculture) Regulations (SUIAR),
  - site-specific HACCP plans, and
  - Environmental Permit requirements (including IED permits);
- risks to compliance, odour, environment and product quality are controlled.
- storage arrangements, storage timescales and waste handling controls are clearly defined.
- Contact Line manager with questions

## Document Control & Governance:

<b>Document Owner Name</b>	Helen Black		
<b>Document Owner Role</b>	Principal Biosolids Technician		
<b>Date of Next Review</b>	07/07/2028		
<b>Version Number</b>	1.0		
<b>Waterpedia Reference</b>	<i>To be entered by Waterpedia Team</i>		
<b>Version</b>	<b>Date Reviewed</b>	<b>Summary of Changes</b>	<b>Reviewed by</b>
1.0	12/02/2026		

**The only valid version of this Standard Operating Procedure (SOP) is the electronic version held in Waterpedia.**

**If printed, it is uncontrolled.**

**Ensure the printed version matches the Revision History details in Waterpedia.**

**If not, ‘DO NOT USE’ and contact your line manager for the new version**



- Meets the receiving works acceptance criteria.
- Complies with regulatory and permit conditions.
- Confirm delivery schedule and quantities.
- Verify that sufficient storage and/or dewatering capacity is available.

**Collection:**

- A base plan schedule is held by the Sludge Planning Office (SPO) and a planning call is held every morning to discuss this schedule against current need. All this is held on a Paragon electronic system. All site managers (or a site rep) attend the morning call. If ad hoc movements required these are requested via the Networks Tanker Hub and added to the Planning Office schedule during the call. Jobs are assigned to a ST driver (via tablet) or contractor (e-mail) and Logger data is captured electronically on cloud based system.
- Digested liquid sludge may only be transported by suitable vehicles – tanker fleet
  - Contact Interworks tankering Team if more information is required
  - Severn Trent does not transport any digestate interworks by pipe.
- Loading of digested liquid sludge is performed via the dedicated Unitspark loggers from the post digestion storage tanks on the export site. The logger system captures data related to each collection:
  - Originating site, collection time, date, volume, average dry solids, vehicle & destination
- A unique identifier would be captured by the Loffer system for each load.

**Acceptance**

Loads would only be transported to a Severn Trent owned and operated sludge treatment facility, which holds an appropriate environmental permit for dewatering imports. Unless there have been problems during transit, the waste would not be deemed to require additional acceptance checks at the receiving STF. All loads are discharged directly into mixture with the indigenous digestate. If there are any last-minute restrictions on the receiving site, then the indigenous digestate would be given priority, and any imports would be diverted to another suitably permitted site. Offloading would not be allowed.

The logger system on the originating site shows the volume of waste being imported. The receiving site SCADA system records waste quantities on site, and has automated alarms for high levels.

**Unloading**

The imported digestate is offloaded into a centrifuge feed tank on site, and is blended with indigenous throughput (both HACCP compliant) and fed through the centrifuge;

The receiving site has its own HACCP plan which will include the option for importing liquid digested sludge;

If there are any process restrictions on site, the imports of digested sludge would be paused until the site is in a positive position to take imports again (prioritising ‘domestic’ sludges over imports). In this situation we would store the digestate on site (as capacity allows) or divert the load to another site that has digestate reception as part of their permit and HACCP plan.

- Arrival at the designated discharge point at the receiving site.
- Confirm the correct receiving tank
- Connect hoses and fittings securely. Verify

- Valves are in the correct position.
- Receiving tank level is adequate.
- Supervise unloading at all times to monitor for:
  - Leaks
  - Spills
  - Foam generation
- After unloading:
  - Flush hoses if required, close discharge valves and disconnect safely

**Sampling**

Sampling is performed in accordance with the annual sampling plan and ad-hoc sampling requests (if required). Ad-hoc samples may be requested by BR Process Team, BR Ops Team, BR Biosolids Team for monitoring purposes or operational reasons.

Sampling is performed in line with individual site HACCP Plans to ensure compliance with the Biosolids Assurance Scheme (BAS). Please refer to the individual site HACCP plan on Waterpedia or contact BR Process or BR Biosolids teams for more information.

Under our strict adherence to the SUIAR and to align with our HACCP plan, we would quarantine any material that fails these factors and follow appropriate corrective action plans, which are specific to the failure.

In additional to HACCP sampling, we sample the liquid digestate at the exporting site on a quarterly basis for metals content. This frequency is because the process and inputs are consistent, and any changes to processes on site may require an earlier resample.

**Tracking**

Tanker drivers are assigned their own dedicated fobs, which allows specific accesses to tankering points dependant on their role.

The below is an example from the tanker logger software used by our Sludge Planning Office:

Start Time	Origin	Volume (m <sup>3</sup> )	Solids %	Target %DS	Discharge Site	Registration	Logger Point	Transaction Type
10/3/2025 10:21:00 AM	MONKMOOR (STF)	26.385	0.44%		STRONGFORD	MTS - LANES	Digested Export	Interworks
10/2/2025 11:16:00 AM	MONKMOOR (STF)	25.987	1.48%		STRONGFORD	MTS - LANES	Digested Export	Interworks
10/2/2025 9:49:00 AM	MONKMOOR (STF)	26.707	1.56%		STRONGFORD	BV17 XHU	Digested Export	Interworks
10/2/2025 6:23:00 AM	MONKMOOR (STF)	26.384	2.89%		STRONGFORD	MTS - LANES	Digested Export	Interworks
10/2/2025 5:42:00 AM	MONKMOOR (STF)	25.455	3.60%		STRONGFORD	BV17 XHU	Digested Export	Interworks

This data is held on the system for at least 5 years.

Digested cake movements are performed by ST contractors and recorded on their systems. The team have a set base plan (frequency of days they move cake from satellite sites to receiving sites) captured on the N62 spreadsheets. Any ad hoc movement would be requested by email to the Biosolids team. These are all held centrally on a cloud-based system.

Example of site “N62 spreadsheet”:

Area		Mansfield										Contractors		Wright's		Period	2025-26
May Wk Ending	Cake Transfer Tonnes	Transfer Distance km	Cake Restoration Tonnes	Restoration Distance km	Cake Landfill Tonnes	Landfill Distance km	Cake Recycling Tonnes	Recycling Distance km	Cake Spreading Tonnes	Cake Extra's Costs	Fuel Adjustment Costs	Stockpile Board Costs	Stockpile Remediation Costs	Pad Management Costs			
01-Feb	111.00	22.590000	0.00	0.000000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
08-Feb	130.52	22.590000	0.00	0.000000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
15-Feb	148.00	22.590000	0.00	0.000000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
22-Feb	144.50	22.590000	0.00	0.000000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	XXXX			

Example of “Overall N62 Spreadsheet”:

Import, Dewatering and Storage of Digested Sludge and Digested Cake	Owner: Helen Black	Page 4 of 9
Version No. 1.0	Next Review Date: 07/07/2028	Published on: 4/3/2026



Activity : Secondary Sludge Treatment (10)

Task : Thickeners (10)

 305844	SAS Belt Plant Operating Procedures for Belt Start Up	Secondary Sludge Treatment	Thickeners	MINWORTH (STW)(14930)
 305846	SAS Belt Plant Operating Procedures for Belt Shut Down	Secondary Sludge Treatment	Thickeners	MINWORTH (STW)(14930)
 305848	SAS Belt Plant Operating Procedures for Daily Area Checks	Secondary Sludge Treatment	Thickeners	MINWORTH (STW)(14930)
 305850	SAS Belt Plant Operating Procedures for Operating and Monitoring Belts	Secondary Sludge Treatment	Thickeners	MINWORTH (STW)(14930)
 305853	SAS Belt Plant Operating Procedures for Manual Washdowns	Secondary Sludge Treatment	Thickeners	MINWORTH (STW)(14930)
 305854	SAS Belt Plant Operating Procedures for Collecting Samples	Secondary Sludge Treatment	Thickeners	MINWORTH (STW)(14930)
 305857	SAS Belt Plant Operating Procedures for Testing Samples	Secondary Sludge Treatment	Thickeners	MINWORTH (STW)(14930)
 305858	SAS Belt Plant Operating Procedures for Performance and Information Boards	Secondary Sludge Treatment	Thickeners	MINWORTH (STW)(14930)
 413690	Belt Thickener Ops Tasks	Secondary Sludge Treatment	Thickeners	MINWORTH (STW)(14930)
 416466	GBT Care Package	Secondary Sludge Treatment	Thickeners	MINWORTH (STW)(14930)

The merged Liquid Digested sludge (import and indigenous) is fed from the relevant storage tank/s to the dewatering equipment on site. Polymer is added during the process to aid dewatering and stability of the treated sludge cake produced.

**Pre-Start Checks**

Confirm: (starts in auto)

- Dewatering process (Centrifuge) is available and operational.
- Polymer system (if applicable) is ready.
- Sludge feed pumps and pipelines are operational.

Inspect:

- Guards
- Emergency stops
- Site standards in the area

Start-Up, dewatering process (starts in auto)

- Start systems (wash water, air, lubrication).
- Start polymer preparation and dosing system (if used).
- Start the centrifuge in accordance with manufacturer instructions.
- Gradually introduce digested sludge feed.

Adjust, if needed, operating parameters to achieve:

- Stable operation, target cake %, acceptable centrate, suspended solids, ammonia
- Continuously monitor- sludge feed rate, Polymer dosage, alarms, cake appearance and consistency

Once dewatered, cake will fall from conveyor into day pad storage area. It will then be transferred to a designated storage bay on the cake pad, transferred to another ST site for storage or transported to field sites.

**Sampling**

Sampling is performed in accordance with the annual sampling plan and ad-hoc sampling requests (if required). Ad-hoc samples may be requested by BR Process Team, BR Ops Team, BR Biosolids Team for monitoring purposes or operational reasons.

Sampling is performed in line with individual site HACCP Plans to ensure compliance with the Biosolids Assurance Scheme (BAS). Please refer to the individual site HACCP plan on Waterpedia or contact BR Process or BR Biosolids teams for more information.

**Non-Compliance**

Should any non-conformance or non-compliance be noted or suspected, this must be reported to the BR Process Team and BR Operations Manager as soon as possible and is captured on a breach report, followed by a Team call to discuss options.

The Digested liquid sludge or Biosolids will be identified and quarantined.

An action plan specific to the situation will then be agreed between the BR Process Team BR Operations team and BR Biosolids team to ensure corrective action for the cause of the non-compliance and suitable mitigations for the quarantined material – this may include additional testing, treatment or other suitable actions such as sending cake to restoration site.

**Storage of Digested liquid sludge - site dependant**

The tanker discharges into a balance/centrifuge feed tank, which has a capacity greater than a single tanker. The indigenous sludge also feeds into this balance tank – and the mixture then feeds the onsite centrifuge for dewatering.

Indigenous sludge is not held back for these imports, it is blended in the same tank, and is a continual mixed feed to the dewatering plant. If there is a capacity issue, we would prioritise processing of indigenous sludge (either delaying or rejecting imported digestate).

The retention time is difficult to predict as it will depend on (i) tank volumes in the tanks prior to import, and (ii) volumes of indigenous sludge production. On average, our dewatering centrifuges are fed 40m<sup>3</sup> per hour at approx. 2.5%DS. Therefore, depending on factors such as plant availability and available capacity, we would expect digestate to be held within the post digestion tank 1-4 hours before dewatering.

**Store digested sludge only in designated tanks**

Maintain:

- Minimum and maximum operating levels.
- Adequate mixing where required to prevent settling.

Monitor:

- Odour
- Foam formation
- Visual inspection of tanks
  - Leaks
  - Overflow risks
  - Abnormal conditions
  - *(Formal inspection of tanks is covered by other ST processes)*

**Storage of Digested Cake**

Digested cake imported from other sites for storage is brought in by lorry tipper, and discharged into a specific bay at the receiving site. This ensures segregation from indigenous cake being produced at that site. Digested cake produced at different sites is not mixed on the cake pad.

The bays are numbered, and clearly labelled on site and on the cake pad schematic plan (which also includes operational capacities of each bay). The schematic is located at entrance to Cake Pad.

Import, Dewatering and Storage of Digested Sludge and Digested Cake	Owner: Helen Black	Page 7 of 9
Version No. 1.0	Next Review Date: 07/07/2028	Published on: 4/3/2026

Stocks are checked daily and recorded weekly on the Site Stocks sheet. A weekly stock sheet is completed at the start of each week for each site, recording the approx tonnage in each bay on each site (allowed capacity of each bay is already filled in), the compliance status of the cake in the bay, where the cake came from. The stock sheet states “standing” if liming is required, and sampling data results (until compliant, then status changed to “available”).

The stock sheet captures if the cake is limed, or it requires liming.

								Week 49 02/03/2026									
Works	Status	Annual Recycled (t)	Monthly Prod	Daily Prod	Bay Capacity	Bay	Capacity %	Filling	Standing	Available	Date Available	Comments	Sampling Data	Site Total (t)	Space (t)	days remaining storage	Capacity %
Finham	BAS Compliant From 08/02/2022	43,000	3,583	100	1500	BAY 1	58%					Not available - GB Civils		4760	5740	57	45%
					1500	BAY 2					Not available - GB Civils						
					1500	BAY 3				1500							
					1500	BAY 4				260	Emptying						
					1500	BAY 5				1400	Emptying						
					1500	BAY 6				1500	Lime cake	11/11/25 (2.00)					
					1500	BAY 7				100	Filling						
					0	Cent						20/03 (3.47) / 23/05 (2.53) / 07/08 (3.21) / 16/10 (3.53) / 01/12 (3.32) / 10/12 (3.32) / 14/01 (2.72) / 05/02 (3.16) / 09/02 (3.20) / 16/02 (3.20)					
					0	Field											
					10500	Totals						0	0				

If further treatment (to comply with BAS) was required, then the addition of lime will be carried out within that bay by hired in plant that holds the required HACCP plan. A job-specific Liming Plan and Liming Checklist would be produced for each liming activity.

Digested cake will be stored on site for a maximum of 12 months.

For removal off-site, details are held in “BIO” (Severn Trent’s Biosolids Integrated Operations cloud based system) of which site the cake comes from and which farm it is to be delivered to, which field, HACCP details, sampling analysis results etc.

**Storage Areas**

- Store digested cake only on the sites designated cake pad, that will have numbered bays

**Handling and Placement - store cake to maintain:**

- Storage within designated bay
- Regular monitoring
- Ensure cake is contained with the cake pad area

**Environmental Controls**

- Ensure rainfall / effluent is contained and directed to the appropriate drainage system.
- Regular monitoring to minimise nuisance risk

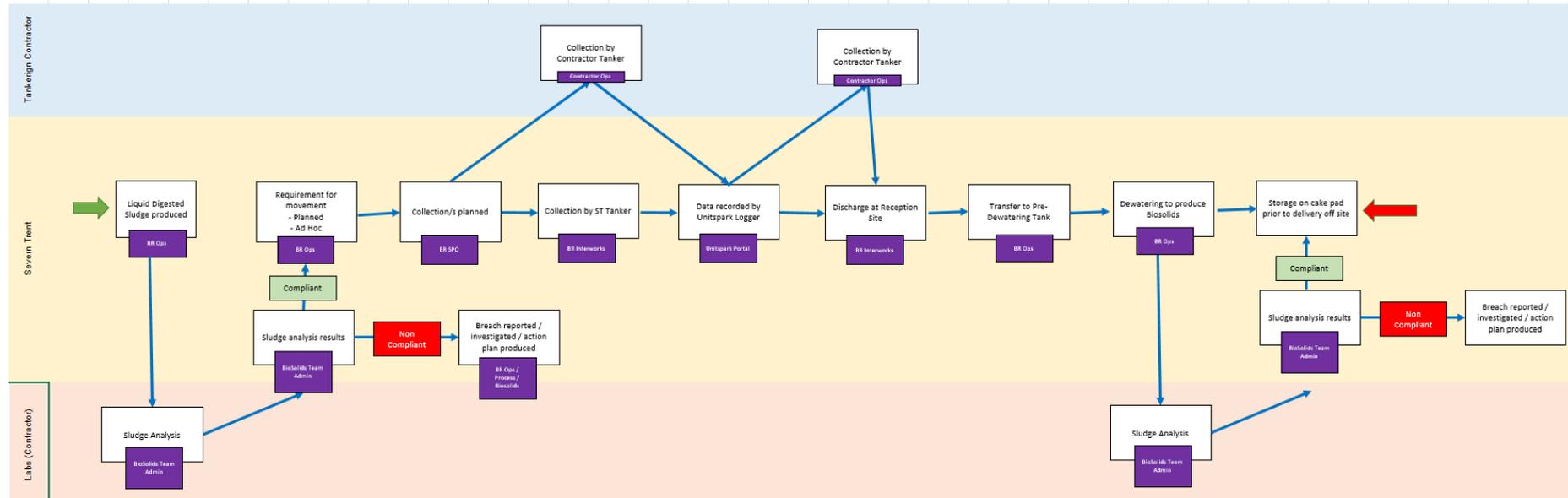
**Inspection and monitoring**

**Regular inspection of cake storage areas for**

- Asset condition
- Stock levels & condition
- Drainage
- Manage storage records, detailing tonnages , availability and sampling data

Remove and clean spilled material immediately.

**Liquid Digested Sludge Movements**



[Flow Charts\Digested Sludge Movements Flow Chart.xlsx](#)