



Bioresource market information commentary

Total capacity

The following assumptions were made when calculating the total capacity of each sludge treatment centre:

- Thames Water asset standard loading rates for volatile (solids) and hydraulic (retention times) have been allowed for. Sludge has been taken as 75-80% volatile matter, based on site average data. Average primary/SAS ratios have been used to calculate solids loading capacities. Digesters have assumed 85% effective working volume to allow for settlement and grit build up.
- Dewatering sites were scoped based on the unit size of the dewatering belt or centrifuge, the loading rate of the machine, the number of days the site is manned, the current maximum operating hours of 12hrs per day.
- Conventional digestion sites have all assumed operation 365 days per year. No allowance has been made for the downtime for the 10-yr annual inspection period as this has been considered as part of the overall system headroom.
- No allowance has been made for unplanned outages as these are difficult to predict in terms of quantity and timescale. Generally ancillary processes to the digestion (eg pumps, dewatering belts etc) have a level of redundancy so that unplanned outage of these assets doesn't impact overall throughput.
- Advanced digestion processes have assumed a planned 14day outage per annum for planned maintenance and statutory inspection of pressure vessels and steam boilers
- The incinerator at Beckton has been taken as the full capacity of all three streams, even though currently only 2 are in operation with third available as standby. Overall, the SPG has assumed 21 days total capacity outage during routine maintenance shutdowns.

Where additional or change in process capacity is expected in AMP7/AMP8 these have been included in the capacity projection. For example, it is assumed that the SPG will be decommissioned at Beckton in AMP8 and replaced with additional Advanced AD processes. The sites in question are:

- Aylesbury • Beckton
- East Hyde
- Mogden
- Swindon

Tradeable Capacity

The amount of tradable capacity is given as what we believe that we could realistically release based on the current/proposed process capacity at sites. Several of our sites have no import facilities, access limitation (e.g., problematic access through built up areas), or process constraints associated with other site infrastructure (return liquor treatment capacity, power distribution) which restrict our ability to release trading capacity. With investment we could release further capacity.

Consideration should also be given to the type of sludge that could be imported and transported around. Moving sludge long distance by tanker can be cost prohibitive, but cake transport is more economic. However, we only have a small number of cake import facilities and these are all at

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capacity to meet current indigenous cake demand; therefore, limits the ability to bring in cake from 3rd Parties.

There are two areas where we believe that we could move sludge around our region and release capacity at a suitable site. These two areas are:

- Northern Region based around Bishops Stortford, Rye Meads and East Hyde. We normally have some headroom in this area, but this is currently being used to assist East Hyde, as that site is currently operating with a shortfall in required capacity. In AMP7 we are building additional digestion at this site to accommodate future growth, so will allow some shortterm trading opportunity once completed.
- M4 corridor. There are relatively good transport links between Swindon, Reading and Slough, therefore we have opportunity to cascade sludge from the Swindon area towards the centre of our area to release capacity.

Headroom Capacity

It may appear that many sites have large headroom capacity, this is due to:

- capacity built for future design horizon (to allow for growth over a 20-year period) which will be eroded over time and so not available for long term trading.
- capacity required to allow for the annual variation in sludge make (note: site capacity is based on annual average throughputs rather than peak demand).
- unplanned outage allowance as we cannot predict this accurately within the total capacity requirement.
- site constraints – for example given the size of many of our sludge centres it is uneconomic to move sludge away from these sites to others during outages, so additional installed capacity has been installed to provide site resilience.
- Historical development has utilised existing assets which were not sized for the change in process technologies.

Summary of site data

| Site | Current restrictions limiting trading opportunity | Reason for headroom |
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| Abingdon | Standalone dewatering site with no import facility. | Headroom capacity to accommodate future growth and due to machine unit sizing. |
| Aylesbury | Site currently running at maximum capacity. Potential opportunity in future to increase capacity further to allow for 3 rd Party shared investment. | Limited headroom to allow for sludge variations and unplanned events. Proposed new digester in AMP8 to restore headroom and allow for future growth. |
| Banbury | There is capacity to trade c2-3tDS/d but import facility currently only allows liquid imports. | Headroom to allow for sludge variations and unplanned events; maintain nominal 95% utilisation (i.e 1.5tDS/d headroom). |
| Basingstoke | Already released 365tDS/y for trading with Severn Trent Connect. No further capacity due to power export limitations which are limiting throughput. | Excess headroom in AMP7 as current restriction on power export limitation. Gas-to-grid plant proposed that will release this restriction and allow site to run at maximum capacity. |
| Beckton | There are no import facilities on site and there are planning restrictions which prohibit imports of non-indigenous sludges. | Headroom based on historic asset base. Proposal to replace SPG in AMP8 as asset at end of life. |
| Beddington | Access to site is problematic due to local community issues, roads infrastructure and significant distance to outlet lands. | Headroom to allow for growth, sludge variations and unplanned events. Asset used to maximise historic sludge tanks. |
| Bicester | Access to site is problematic due to local community issues around encroachment. | Dewatered cake feeds Oxford, which limits throughput due to reception site capacity. |
| Bishops Cleeve | There is opportunity to release capacity as part of a wider review in the North region. Currently sites can only accept liquid imports. | Headroom to allow for growth, sludge variations and unplanned events. Assets use historic sludge tanks which are not ideally suited for current sludge make. |
| Bracknell | This site has limited power usage benefit and increased imports would result in grid exports, which are near capacity. Location is not well suited for imports due to small rural road network. | Headroom to allow for growth, sludge variations and unplanned events. |
| Camberley | Standalone digestion site with no import facility. Currently no spare capacity to release. | Site running at design limits, so headroom needed for operational reasons. |
| Chertsey | Site provides strategic capability due to central location. Access is good but site makes limited use of power (filter works). | Strategic headroom needed to allow for Mogden reconfiguration in AMP7/8. |

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| Cranleigh | Standalone dewatering site with no import facility. | Headroom capacity to accommodate future growth and due to machine unit sizing. |
| Crawley | Currently no spare capacity as this is one of 3 cake import facilities and always runs at maximum throughput. No liquid imports. | Normal operation plant is running at capacity; annual outage utilises capacity at Long-Reach. |

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| Crossness | There are no import facilities on site and there are planning restrictions which prohibit imports of non-indigenous sludges. | Headroom based on historic asset base (old large digesters) and 20-year growth forecasts. |
| Deephams | Site is already running near design limit. | Site running at design limits, so headroom needed for operational reasons. |
| Didcot | Site is too small to provide meaningful opportunity for significant imports. Currently no outlet for biogas except to flare. | Site running at design limits, so headroom needed for operational reasons. |
| Earlswood | Strategic dewatering facility, liquid sludges brought into feed Crawley. | Dewatered cake feeds Crawley, which limits throughput due to reception site capacity. |
| East Hyde | Currently site can only accept liquid imports and is running at maximum capacity. Once additional capacity is installed tradable capacity could be released in the North region. | Additional assets are being delivered in AMP7, with headroom allowing for growth, sludge variations and unplanned events. |
| Farnham | Access to site is problematic due to local community issues around encroachment and odour concerns. | Dewatered cake feeds Basingstoke, therefore, throughput limited due to reception site capacity. Headroom capacity due to machine unit sizing. |
| Fleet | Standalone dewatering site with no import facility. | Headroom capacity to accommodate future growth and due to machine unit sizing. |
| Godalming | Standalone dewatering site with no import facility. | Headroom capacity to accommodate future growth and due to machine unit sizing |
| Guildford | Guildford site is currently being relocated, so no immediate opportunity to import sludge. | Dewatered cake feeds Basingstoke, therefore, throughput limited due to reception site capacity. Headroom capacity due to machine unit sizing. |
| Hogsmill | Access to site is problematic due to local community and road infrastructure. The site is in the middle of a built-up area and significant distance from outlet sites. No import facilities on site. | Headroom to allow for growth, sludge variations and unplanned events. |

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| Little Marlow | Access to site is problematic due to local community issues around encroachment and odour concerns. | Dewatered cake feeds Oxford, therefore, throughput limited due to reception site capacity. Headroom capacity due to machine unit sizing. |
| Long Reach | There is capacity available to trade, but location is just off the busiest junction of the M25 so may limit opportunity. | Headroom to allow for growth, sludge variations and unplanned events. Additionally, need to retain 15tDS/d headroom as contingency for Crawley outages. |
| Maple Lodge | Site can only accept liquid imports, but some capacity could be released within the wider North region following adjustment to logistics plans. | Headroom in primary digesters but secondary digestion tanks now limiting factor (deteriorating civil condition) to release full capacity. |
| Mogden | Site can only accept liquid imports. The site is currently undergoing a major upgrade so there is limited opportunity to increase imports. Import capacity fixed to 30 tankers per day under planning conditions. | Headroom to allow for growth, sludge variations and unplanned events. |
| Newbury | Strategic dewatering facility, liquid sludges brought into feed Basingstoke. | Dewatered cake feeds Basingstoke, which limits throughput due to reception site capacity. |
| Oxford | Currently no spare capacity as this is a strategic cake import facility that always runs at full throughput. | Headroom to allow for growth, sludge variations and unplanned events. Currently restriction in throughput due to major digester refurbishment and limitations on liquor treatment capacity. |
| Reading | Site can currently only import liquid sludge. There is spare capacity that could be released but location in central to region, so would have to consider changes to wider logistic plan to move sludge along M4 corridor. | Headroom to allow for growth, sludge variations and unplanned events. Currently slight restriction in throughput due to limitations on liquor treatment capacity. |
| Riverside | Currently no import facility. | Headroom to allow for growth, sludge variations and unplanned events. Riverside accepts Beckton sludge via sewer transfer and provides resilience when outage. |
| Rye Meads | Site can only accept liquid imports, but some capacity could be released within the wider North region following adjustment to logistics plans. | Headroom to allow for growth, sludge variations and unplanned events. |
| Slough | Site can currently only import liquid sludge. There is spare capacity that could be released but location in central to region, so would have to consider changes to wider logistic plan to move sludge along M4 corridor. | Headroom to allow for growth, sludge variations and unplanned events. |

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| Swindon | Site can currently only import liquid sludge. There is currently no spare capacity that could be released but changes to wider logistic plan to move sludge along M4 corridor could free this up. | Headroom to allow for growth, sludge variations and unplanned events. Existing digesters will be replaced in AMP7 in preparation for AAD installation in AMP8. |
| Wantage | standalone dewatering site with no import facility. Cake diverts to Oxford so limited by capacity of reception site. | Headroom capacity to accommodate future growth and due to machine unit sizing. |
| Wargrave | Site can only import liquid sludge but there are restrictions to large vehicles due to weight limit on access bridge. | Headroom to allow for growth, sludge variations and unplanned events. Access to site is restrictive so limited imports. |
| Witney | Strategic dewatering facility, liquid sludges brought into feed Oxford. | Dewatered cake feeds Oxford, which limits throughput due to reception site capacity. |
| Woking | Standalone dewatering site with no import facility. Cake diverts to Crawley so limited by capacity of reception site. | Headroom capacity to accommodate future growth and due to machine unit sizing. |