Jacobs

J840 – STC IED Containment

Wargrave STC – Containment Options Report

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Thames Water

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Contents

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1. Executive Summary

Thames Water is required by the Environment Agency to provide secondary containment to their sludge treatment centres to satisfy provisions of the Industrial Emissions Directive and to safeguard the operation of the adjacent sewage treatments works. Twenty-five sludge treatment centres have been identified where containment proposals are required. This report deals with the proposals for Wargrave.

Wargrave serves a population equivalent of 118,000 taking in sewage from Wargrave and surrounding area. The sludge treatment centre shares the same site as the sewage treatment works.

CIRIA Report 736 – Containment systems for the prevention of pollution sets out principles and direction. This report sets out options to apply the CIRIA 736 principles within the accepted constraints of a retrofitted solution.

Wargrave holds some 7,889m^3 of liquid within the sludge treatment centre. The liquid sludge is stored in 11 tanks with individual volumes varying between 8 to 2,200m^3 and the majority of the tanks are steel. The site is generally low lying and flat but with some localised raised berm zones. The containment volume of 3855m^3 is driven by largest tank plus rainfall rule, which exceeds the 25% rule (25% of total tank volumes which includes allowance for rainfall) and the 110% rule (of the largest single tank).

An initial review together with TW operations was carried out to confirm that the working of the sewage treatment work would not be compromised by proposal. In the review closed containment and wide containment options were discussed. Within this report, failure of a primary digester tank (largest spilled tank) has been addressed by adopting a wide containment area. Refer to section 4.1 for details on the options reviewed and section 4.3 for the preferred option. Below a summary of the preferred option:

1. Wide area containment area, whereby spilled sludge is contained within a bunded boundary with sufficient area to generate shallow depth that does not deny emergency access to equipment when the spill has been contained. Access and containment will be provided through the use of ramps and steps depending on access requirements. Gravel and natural ground areas will be removed and replaced with plain concrete to prevent seepage of spilled sludge liquid into the ground. Float valves will be installed onto surface water drains to prevent spilled sludge from returning immediately to the head of the works.

Bund heights are being set to provide freeboard considering both static conditions when the containment has been filled and during the transient condition at initial failure. There is the potential for some flow to overtop the access ramps during the conditions of the initial burst which is addressed by tertiary containment and conveyance to the site drainage system which discharges to the inlet works.

In addition to the creation of bunds, which due to space constraints are likely to be formed from concrete, existing grass or gravelled areas will be replaced with a bound impermeable material (high cement replacement concrete) to provide a surface that can be cleared of sludge to meet an eight-day recovery period. Vehicular access into the containment areas is by ramps (speed humps) restricted to nom 500mm in height; traffic movements on site make the use of permanent flood gates impracticable. Whilst the site is identified as requiring Class 2 containment (impermeable soil with a

liner), the proposed solution is intending to concrete (with no liner) on the basis of the impermeability of the concrete, inherent strength and long-term mechanical resistance.

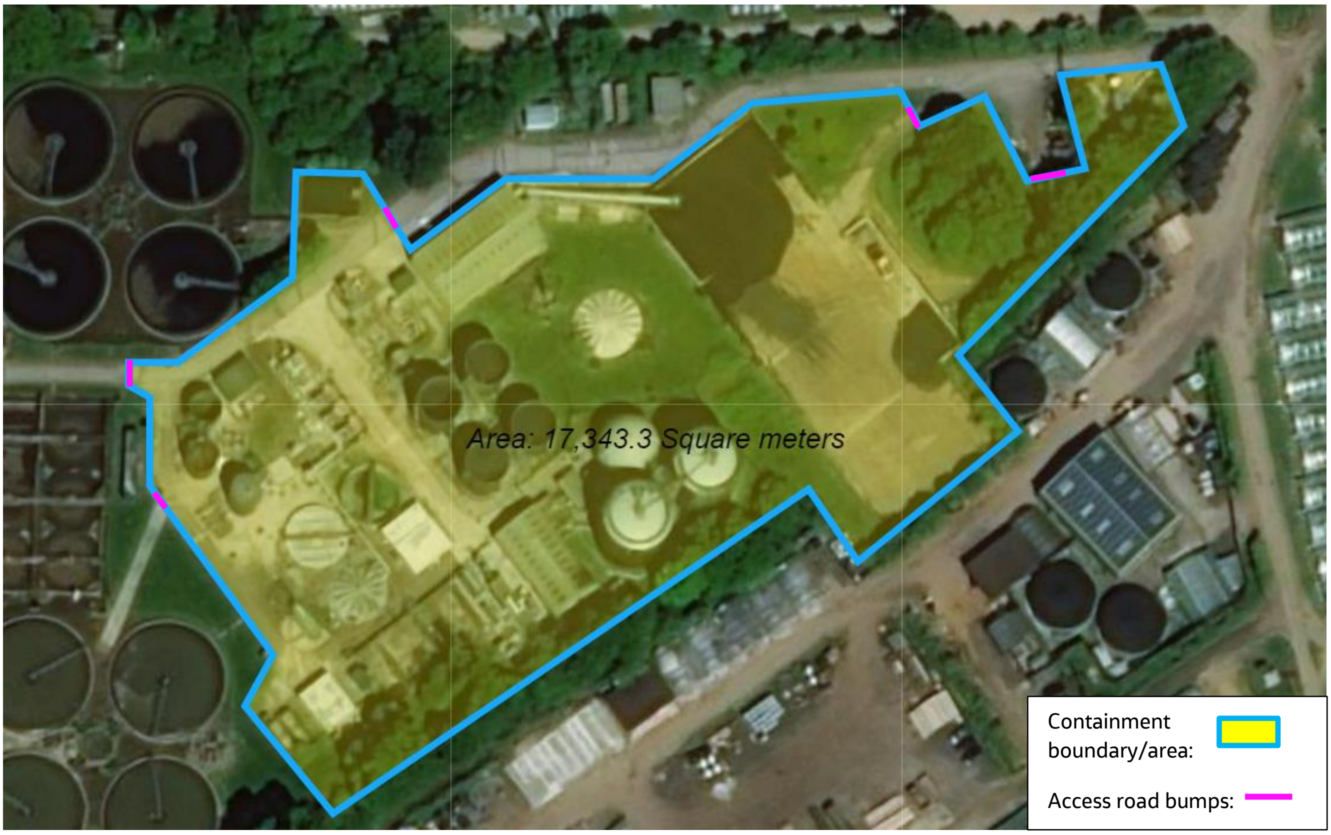

Figure 1-1 - General layout of proposed Option

Grassed and gravel areas within the yellow area are to be replaced by concrete. Some of the concrete roads in the yellow area may need to be replaced/repaired to enable them to be impermeable. There are also areas with a localised raised ground level where spoil has been reused. These areas are planned to be dug out and a uniform ground level set at 35.5mAOD with impermeable concrete, adding to the overall storage capacity.

2. Background

Following initial audits by the Environment Agency (EA) in 2019 that examined the primary, secondary, and tertiary containment provisions for Thames Water's anaerobic digestion (AD) process and associated tanks, the EA reported *"there is no provision of secondary containment for the AD process at any of Thames Water's sites. Catastrophic tank failure may impact nearby receptors and the operation of adjacent sewage treatment activities".* Jacobs were appointed to assess site risks and outline the options available for providing remote secondary containment of a catastrophic tank or digester failure across 25 Thames Water sites. Based on CIRIA C736 and ADBA risk assessment tools this containment report addresses the site-specific risks at Wargrave and outlines the options available for providing remote secondary containment in the event of a catastrophic tank or digester failure.

The current assessment identified gaps between the existing conditions of the sludge assets in Wargrave STW and the requirements to meet the industrial standard (i.e., CIRIA C736 and The Anaerobic Digestion and Bioresources Association Limited (ADBA)). Site-specific risks, credible failure scenario and design containment volume for the Wargrave STW were identified through a desktop study, Light Detection and Ranging Analysis (LiDAR) analysis and a site visit.

Wargrave STW is located southwest of Wargrave village. The site lies east of River Loddon and is surrounded by Plant Nursery Farms to the east, northeast and southeast of the site, an Industry to the southeast and fields and woodlands to the east, north and south of the STW. There is also a Railway line and a Main Road, A321, to the east of the site. The STW serves a population equivalent of 118,000.

Figures 2-1 to 2-3 overleaf show the location of the STW and show detail of the site.

Figure 2-4 shows the Boundary of the permitted IED area and the assets contained within Wargrave STW.

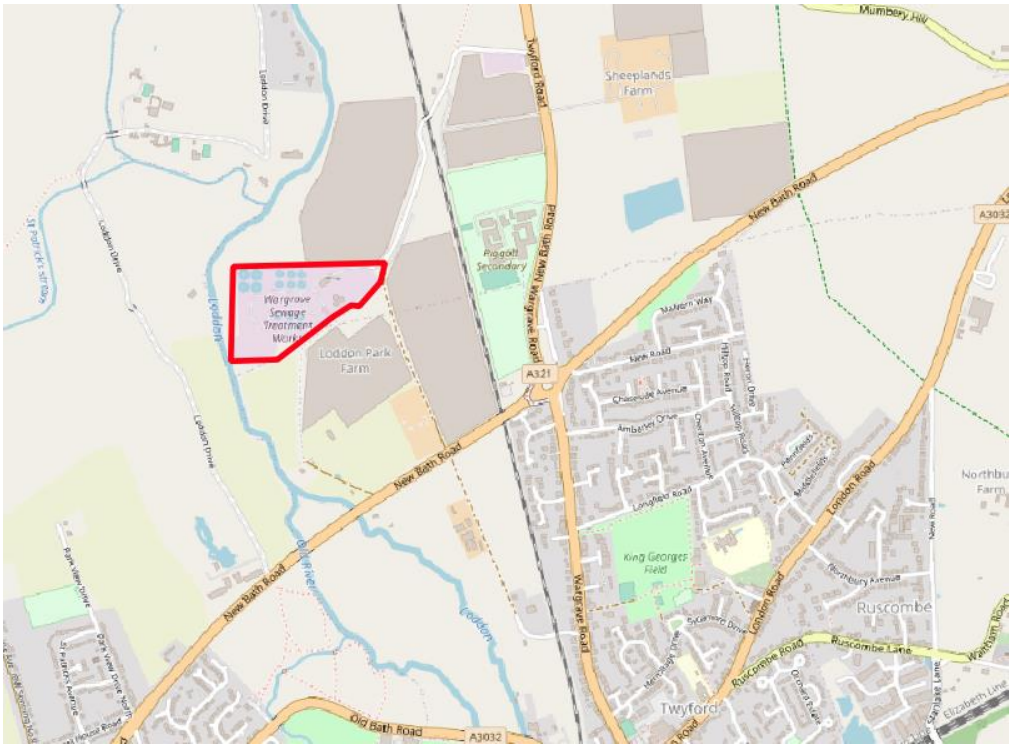

Figure 2-1 - Location Plan Wargrave Sewage Treatment Works

Figure 2-2 - Satellite view of Wargrave Sewage Treatment Works

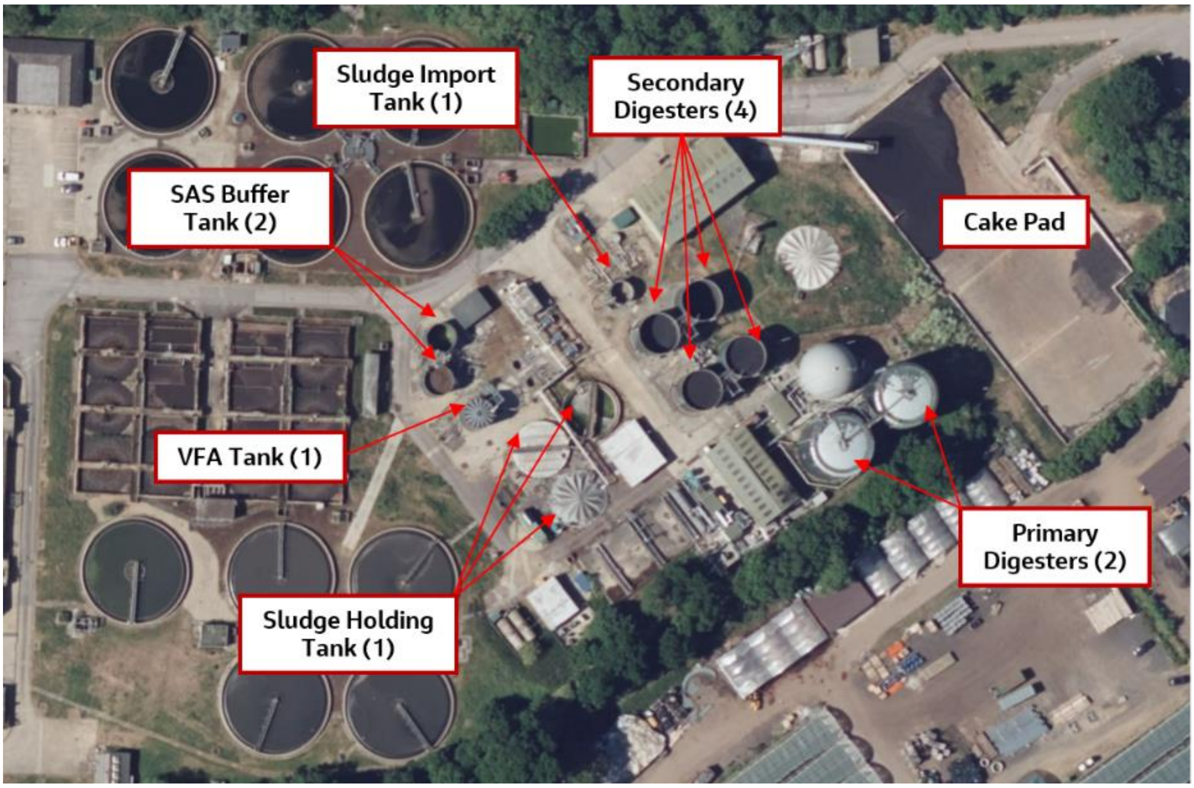

Figure 2-3 - Wargrave Sewage Treatment Works – Digester Area Plan (Major Tanks)

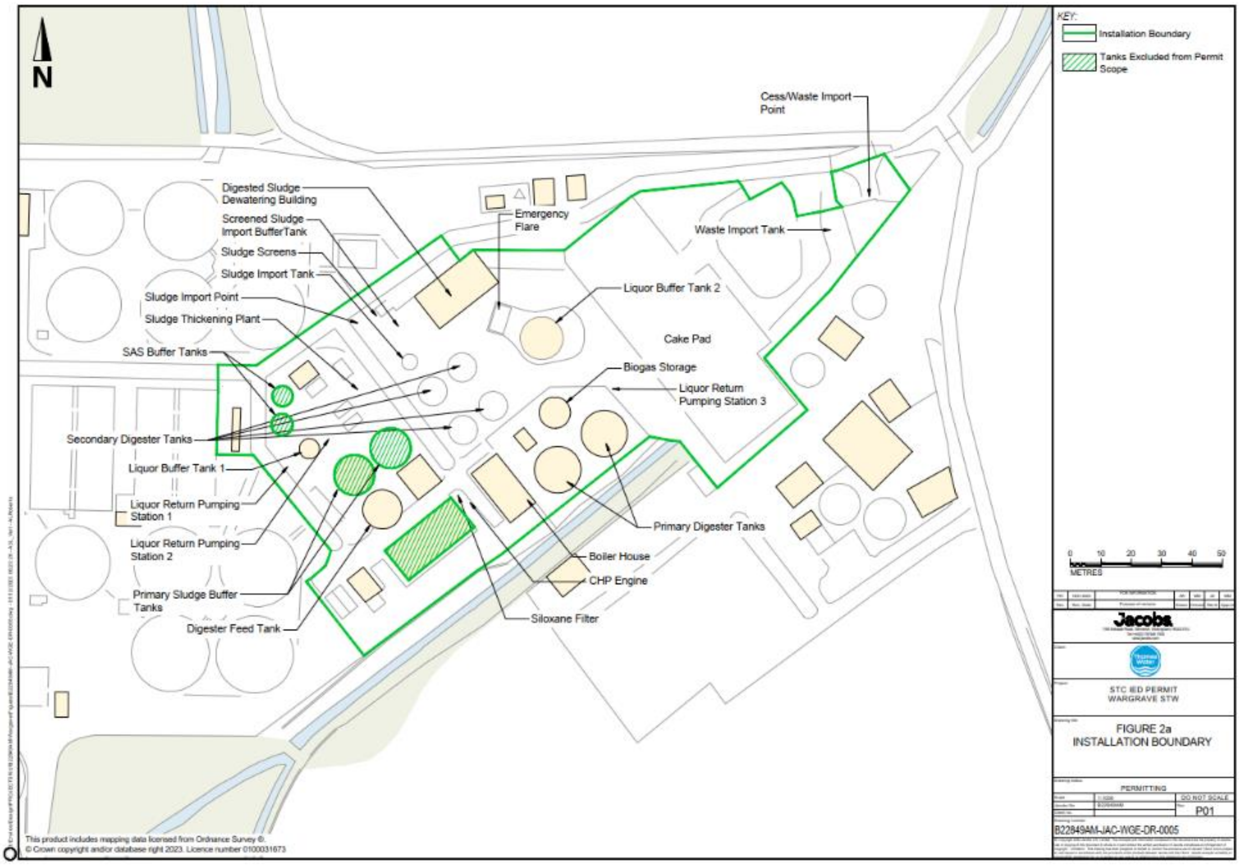

Figure 2-4 - Boundary of the permitted IED area and the assets contained within Wargrave STW.

3. Proposed Containment at Wargrave STW

3.1 CIRIA C736

This containment option report has been prepared using CIRIA C736 as the basis of design and guidelines. Where a deviation from C736 has been recommended it is highlighted in the text.

CIRIA guidance document C736 *(Containment systems for the prevention of pollution – Secondary, tertiary, and other measures for industrial and commercial premises, 2014)* describes various options for containment of spillages from a credible failure scenario. It makes reference to a key plan, reproduced below;

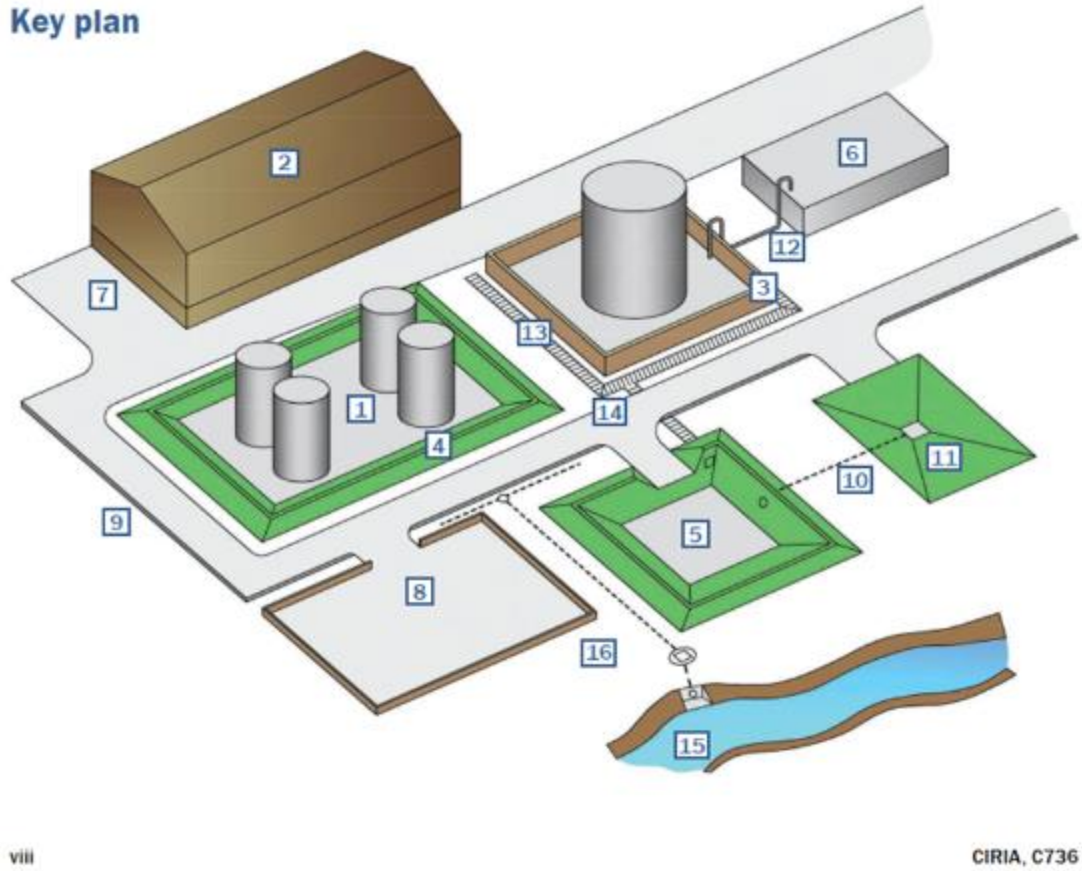

Figure 3-1 Diagram of primary, secondary and tertiary containment examples

-**Primary containment** is provided by the actual tank or vessel [1]

-**Secondary containment** is provided by a bund immediately surrounding the primary vessel e.g. [3] and [4], or by a lagoon [5] or tank [6]. If containment is provided away from the primary vessels this is known as **remote containment** and may be considered as either **remote secondary** or **tertiary containment**.

-**Tertiary containment** can be provided by a number of means including lagoons [5], or impermeable areas such car parks [8]. Roadways with high kerbing of sufficient height [9] can also form part of a tertiary containment system, or the **transfer system** to the remote containment.

The distinction between *remote secondary* and *tertiary* containment is not always clear but, if properly designed, a combined system can be provided that is capable of providing the necessary degree of environmental protection. The overriding concern is not the terminology but the robustness and reliability of the system which depends on a number of factors such as;

- Its complexity – the more there is to go wrong, the greater the risk. Passive systems relying solely on gravity are more reliable than pumped.
- Whether manual intervention is relied on to make the system work or whether the system can be automated to include fail-safes and interlocks.
- The ease of maintenance and monitoring of the system's integrity, and repair of any defects.

During and after an incident any rainfall runoff from the remote secondary storage areas, from the spillage catchment areas and from the transfer systems must also be prevented from reaching any outfall(s) to surface water by closure of control valve(s).

3.2 Objectives of remote secondary containment

The objectives of the remote secondary containment measures proposed in this report are to safely contain spillages from credible failure scenarios and prevent them from:

- escaping off site
- entering surface waters
- percolating into groundwater
- being pumped back to the inlet of the sewage works in an uncontrolled manner.

The remote secondary containment will be provided by maximising the use of existing impermeable surfaced areas to provide a fail-safe passive system that relies on gravity rather than pumps. A means of leak detection that will automatically trigger isolation valves at key locations in the drainage system is also proposed.

3.2.1 Uncontained Spill modelling

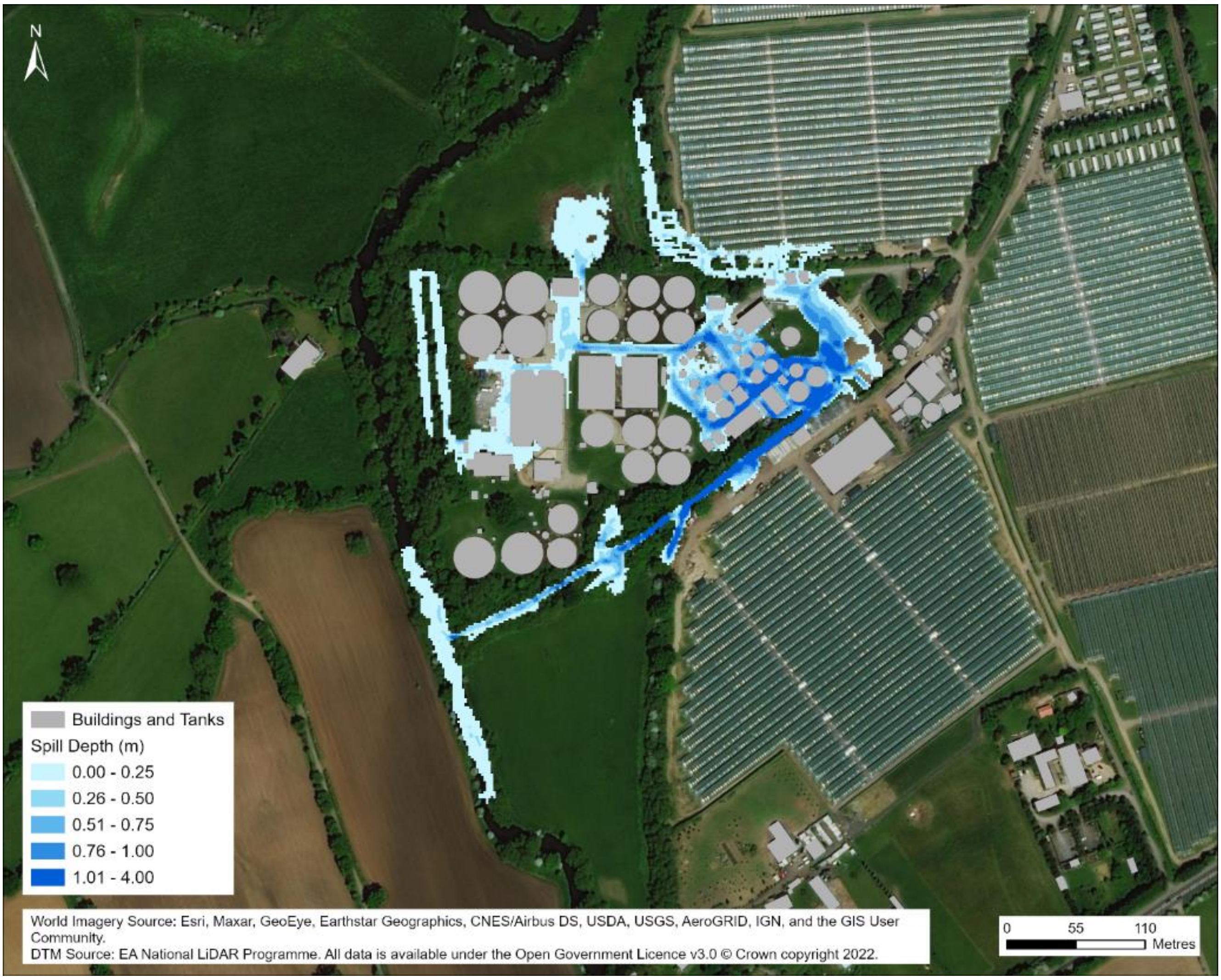

Figure 3-2 - Uncontained Spill Model Results

As seen from Figure 3-2, the sludge spill mapping of an uncontained event in Wargrave STW showed that a potential sludge spill from the one of the Primary Digesters will not be self-contained within the site and therefore passive containment needs to be implemented to safeguard the nearby receptors. According to the model the spill will leave the site boundary (by the south-eastern site boundary) in approximately 4 minutes after the failure of one of the Primary Digesters.

Assuming the spill is from the failure of one of the larger Primary Digester on site, the sludge would fill the primary digester area. Some of the sludge would then flow southwards, immediately crossing the south-eastern site boundary into an open earth drain between the STW and the adjacent plant nursery where it will split into two flows. The first flow will branch eastwards towards the cake barn area where along the way, some of it will branch south towards the edge of the parking area of the adjacent AMS Int Furniture Installations Industry. The second flow will branch westwards along the open earth drain and will travel further west, eventually flowing into River Loddon. Along the way, some of this sludge will spread into the woodland and the bounds of the nearby plant nursery located south of the STW.

Some of the sludge from the failed tank will flow eastwards from the primary digester area towards the cake barn area. While some of this sludge will spread in the cake barn area, some of it will flow northwards across the site entrance road and will leave the northern site boundary through the gaps between the O2 Mobile Telephone Mast Compound, the Disused Gas Oil Tank and the Sewage Pumping Station. This sludge will proceed to flow northwards into the bounds of the adjacent plant nursery where it will split two ways. Part of the sludge will travel eastwards along the edge of the plant nursery while the rest of it will travel westwards along the edge of the plant nursery towards the boundary of the adjacent green field, where it branches northwards.

3.3 Site Classification Wargrave

Based on the use of the ADBA risk assessment, considering the source, pathway and receptor risk Wargrave site hazard rating is deemed to be High. When considering the mitigated likelihood as low a class 2 secondary containment is required.

Source Risk	Pathway Risk	Receptor Risk	Site Hazard Rating	Likelihood	Overall Site Risk Rating
High	**Medium**	**Medium**	**High**	**Low**	**Medium (Class 2)**

Refer to appendix 1 for summary of the ADBA risk assessment tool.

3.3.1 Spill Volume Summary

There are two components that contribute to the required capacity of secondary containment, the source spill volume requiring containment and rainfall. Section 4 of CIRIA 736 forms the basis of this assessment. Section 4.2 reviews current industry practice relating to source spill volume, section 4.2.8 then summarises current industry practice relating to source spill volume in a tabular form. It can be seen from section 4.2.8 that sewage sludges and associated regulations / guidance are not listed.

Within section 4.2.1 there is detailed reference to the use of 110% of the largest tank or 25% of the total tank inventory volume, whichever is greater, and the rationale for this. CIRIA recognises that this approach is not quantitative or based on a risk assessment and are arbitrary methods. Section 4.3 and 4.4 provide guidance on a quantitative risk assessment methodology and this is what is being used for the calculation of the required capacity for containment in this report.

3.3.2 Total Spill Volumes

The containment volume has been checked against the largest tank + rainfall, 110% rule and 25% rule. The total spill volume is 3855m^3 (largest single tank failure of 2200m^3 + total rainfall of 1655m^3 from Flood estimating handbook over the catchment area) compared to 110% of largest tank failure or 25% of the total volume of all tanks within the containment area, which includes allowance for rainfall.

3.4 Wargrave STW Summary of Containment volumes and assets

3.4.1 Assets for Containment

The sludge tanks that fall under IED are summarised in the table below and secondary containment is provided to the tanks that sit above ground level:

Tank Purpose	No.	Operational Volume (m^3)	Total Volume (m^3)	Material	Tank Level
Sludge Import Buffer Tank	1	62	62	Steel	Above GL
Screened Sludge Import Buffer Tank	1	7.5	7.5	Steel	Above GL
Digester Feed Tank	1	343	343	Concrete	Above GL
Liquor Buffer Tank 1	1	223	223	Steel	Below GL
Liquor Buffer Tank 2	1	343	343	Concrete	Above GL
Primary Digester Tank	2	2,200	4,400	Steel	Above GL
Secondary Digester Tank	4	733	1,466	Steel	Below GL

3.4.2 Digital Terrain Model

LIDAR data of the site (Figure 3-3) reveals that the STW has uneven topography and that there are several gaps along the site boundary where sludge could potentially escape the site in the event of a sludge tank failure. There are gaps along the southeast boundary behind the primary digesters, northeast boundary between the O2 Mobile Telephone Mast Compound, the sewage pumping station and the Disused Gas Oil Tank, northwest boundary behind the management building and the final settlement tanks, western boundary near the Inlet Works and southeast boundary behind the Storm tanks. If sludge reaches these locations, the risk of spilling into the adjacent plant nursery farms, fields, Industry and River Loddon would be inevitable.

Figure 3-3 - Digital Terrain Model of Wargrave Sewage Treatment Works

3.4.3 Contained Model

The contained model output is shown in Figure 3-4. This identifies the flow will be contained at a fairly uniform depth across the site apart from some localised areas with higher ground levels. The contour map (Figure 3-5) highlights the raised levels which were levelled for the sake of analysis. There is scope to lower these levels as they are grass areas and will be resurfaced with concrete at a depth of 300mm. The containment model shows that for 100% volume loss the top water level will settle at 35.60m A.O.D. Therefore, allowing for 250mm freeboard on the bund wall the bund wall level will be at 35.85mAOD. A redundant tank on the northwest of the site was also included that receives some of the spilled sludge. Possible diversion of spilled sludge into this tank should be considered in detailed design.

Figure 3-4 - Containment spill model

Figure 3-5 shows the contour plot for the containment area. The lowest area can be seen along the West border of the containment area running along the road. To lower the bund height along this border, raising the ground level and reprofiling the road may be required. The rest of the containment area is relatively level at 35.5mAOD. There is a natural raised berm on the southwestern border that will be utilised as part of the overall bund height.

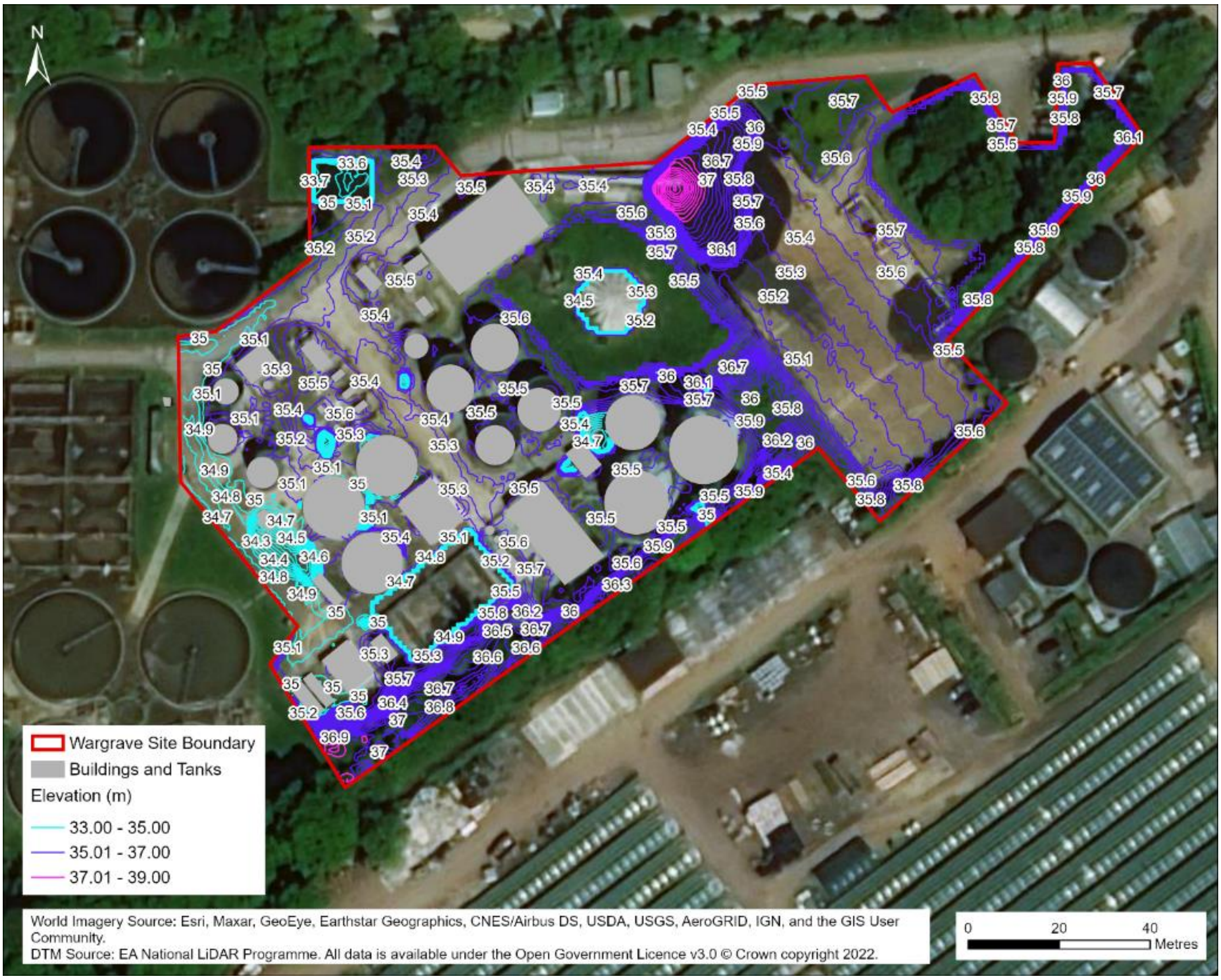

Figure 3-5 - Contour map of the contained area

3.5 Identified Constraints

3.5.1 Operational constraints

The existing ground surfaces are mainly grass and gravel and this will need to be replaced with impermeable surface e.g. concrete from which sludge can be cleared up easily.

TW operations have stated that it would be difficult to clean up sludge from gravel areas as the gravel would also sucked up with the sludge.

The time to recovery and return site back to operation has been set at 3 days following direction by Thames Water. The containment volume, when not dictated by the 110% or 25% containment rules allows for three days of rain during the recovery period and one day of rain immediately preceding an event.

There is no impact to the site admin buildings or car park areas as these are excluded from the containment area.

3.5.2 Geotechnical and Environmental constraints

Ground conditions need to be considered during excavating and backfilling activities.

Regarding the construction works, there are no significant environmental constraints as these will all be completed within a Thames Water site.

The existing shrubbery within the containment area shall be removed and area infilled with concrete. To compensate for the loss of shrubbery, alternative areas shall be identified onsite for compensation planting or planting containers installed onsite. Some existing natural bund areas will be utilised as part of the design, where possible.

3.5.3 Other constraints

None identified

3.6 Design allowance for rainfall

In addition to the maximum volume arising from a credible failure scenario, extra allowance for rainfall that may accumulate within the contained area before and after an incident has been made. The CIRIA guidance recommends that the containment volume should include an allowance for the total rainfall accumulated in response to a 1 in 10-year return period events for the 24 hours preceding the incident and for the duration of the incident, a three-day period in this case. The arising average rainfall depths for a 1 in 10-year storm over the event period for Wargrave is 54mm. It should be noted that the rainfall depths for Wargrave have been estimated using the depth-duration-frequency rainfall model contained on the *Flood Estimation Handbook* (FEH), which provides location specific rainfall totals for given durations and return periods.

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4. Secondary Containment

The constituent parts of secondary containment are;

- The contained area itself.
- The transfer system.
- Isolation of the drainage from both the contained area and from the transfer system.

For Wargrave, where possible, existing features of the site (e.g., natural raised bunds, building structures and impermeable surfaces) are used as much as possible to provide the remote secondary containment to reduce cost. The options considered, modifications and their functionality at Wargrave STW are listed below:

- Natural bunds surround the existing sludge holding tanks in some locations.
- Bund/walls to contain liquid. The heights of bund/walls given in Section 4.1 are the minimum heights required such that that top of the bund/wall is equal to the top water level plus a 250mm freeboard consideration for potential surge (to reflect the planned use of concrete walls with a recurved profile to return flow back on itself) in accordance with CIRIA. Containment ramps provide a barrier for the liquid on roads that still need to be accessible to vehicles for site operation. The maximum height of these will be 500mm to avoid issues with vehicle passage. The risk of spill at the ramps is mitigated by conveyance of the flow to site drainage and return to the head of the works.
- Local infill of grass/gravel to create an impermeable surface and facilitate containment and conveyance.
- Raised kerbs on roadways to channel spill to the remote containment area.
- All buildings within the containment and transfer areas must either have doors that lie above the top water levels detailed in Section 4.1 or any equipment inside must be raised off the ground to level above the top water level.

4.1 Containment Options

4.1.1 Containment Option 1 – Wide Area Approach

This option utilises containment surrounding the tanks in the permit area, which provides secondary containment to the sludge processing facilities. Figure 4.1 highlights the containment area. The containment area is approximately 30,246m^2 but the actual available containment area will be less than this as areas such as the offline secondary digestor tanks and buildings will not be included in the storage volume.

The total spill volume is 3855m^3 (largest single tank failure of 2200m^3 + total rainfall of 1655m^3 from Flood estimating handbook over the catchment area). LiDAR spill modelling calculated the top water level (TWL) when 3855m^3 is contained in this area to be at 35.6mAOD.

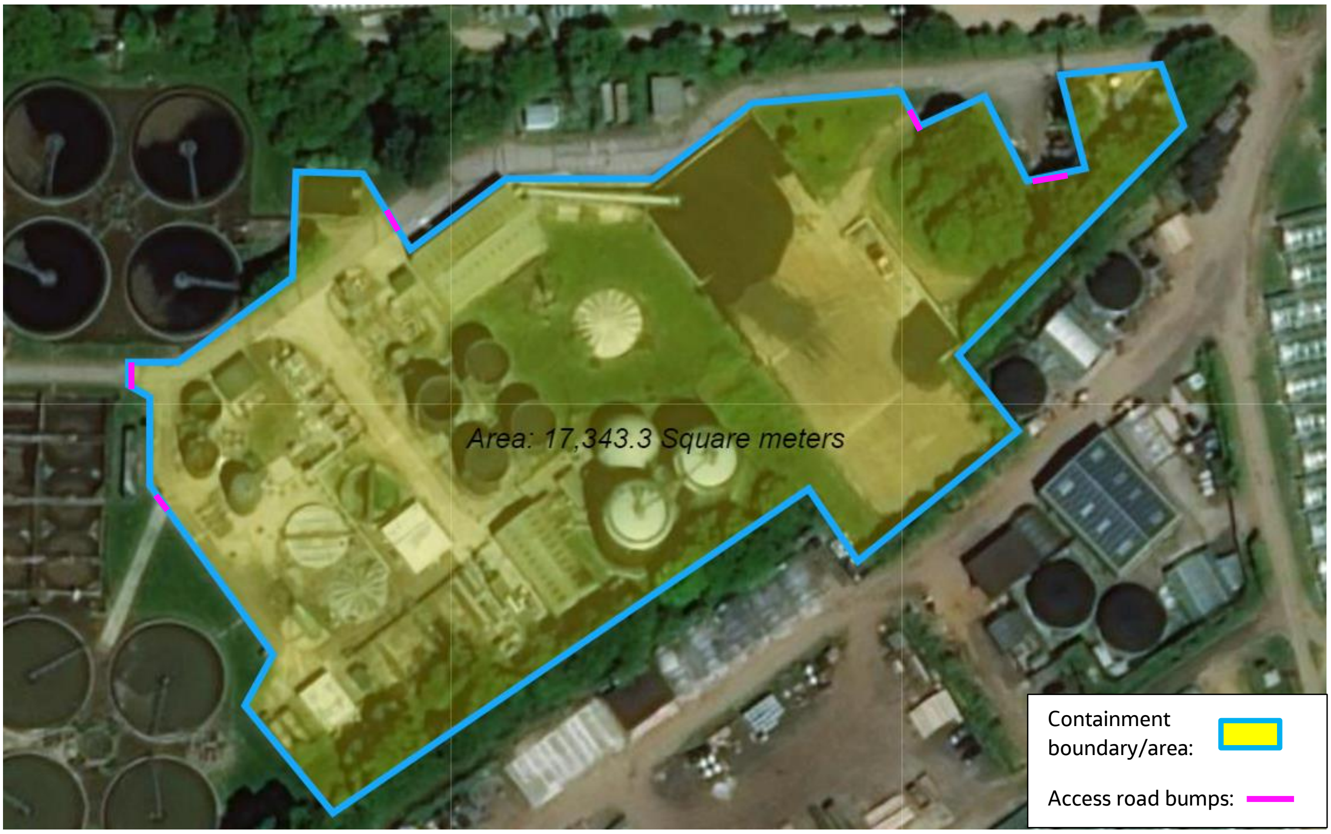


Figure 4-1 – Containment Option 1

Bunding will be constructed to a level of 35.85mAOD to provide 250mm of freeboard above the 35.6mAOD top liquid level of a spill. The walls will be a mixture of low concrete bund walls (500mm) and tall reinforced walls on the western boundary where containment depths are slightly higher (500-1000mm). To reduce making substantial changes to the environment and limit the use of concrete areas of raised natural berms will be incorporated into the overall containment design. These will be fitted with an impermeable lining.

The top of the bund could incorporate a deflection profile that will reduce risk of overtopping immediately after a spill event and ensuring spill volumes remains within the containment area. Detailed design will assist with the final deflection profile to account for this risk. There is the potential for some flow to overtop the access ramps during the conditions of the initial burst which is addressed by tertiary containment and conveyance to the site drainage system which discharges to the inlet works.

It should be noted that following the consultation with operations, the cake pad has been included as a means to manage the resulting containment depth by maximising the available area that can be used for containment

In order to allow access to the containment areas on foot and via vehicle two options have been proposed. To allow vehicular access into the containment area ramps will be constructed across the roads which intersect the containment area. These ramps will be limited to a height of 500mm with a slope of 1:20. To allow access on foot, steps with handrails will be constructed to allow workers to traverse the walls.

All grass and gravel areas will be excavated and resurfaced with concrete at a depth of 300mm. This will mitigate seepage into the local ground and soil. The ground can be reprofiled in these high areas to assist with the sludge flow path. This also aids cleaning procedures following a spill. Figure 4-2 highlights the grass areas that have a locally raised ground level. These areas will be lowered to 35.5mAOD and resurfaced with concrete.

Figure 4-2 – Areas of raised ground within the containment area

TW Operations have stated that there is uncertainty about the existing drainage network and whether all flows are pumped back to the head of the works. According to the site drainage plans (ref Section 5), flows do not return to the head of the works so drainage surveys are being undertaken to confirm whether any spill will be contained within the site.

4.1.2 Containment Option 2 – Close Containment Approach

Figure 4-3 – Containment Option 2

A close containment option was explored for Wargrave, using only the sludge treatment area as containment areas. The sludge containment heights made access impossible with vehicles in a catastrophic spill and it was impractical for operations to have high walls around their site. Following a conversation with TW this option was not developed further.

4.2 Mitigation of Site-Specific Risks

4.2.1 Jetting and Surge Flows

Due to the location of the tanks and their distance from the boundary of the containment area, there is no risk of contamination through jetting.

There is a low risk of jetting occurring as the majority of the digester tanks are concrete construction, for which catastrophic failure is deemed to be less of an issue. Failure is more likely to begin with major seeping from the tanks which would be spotted during routine site walkabout tours each day.

The natural topography of the site and the distance to the boundaries of the containment area results in a low risk of surge overwhelming the containment.

4.2.2 Flooding

According to the UK Government’s Flood Map for Planning, Wargrave STW is not within any potential flooding zone as shown in Figure 4.4 therefore, no modifications need to be made to Wargrave STW to accommodate this risk.

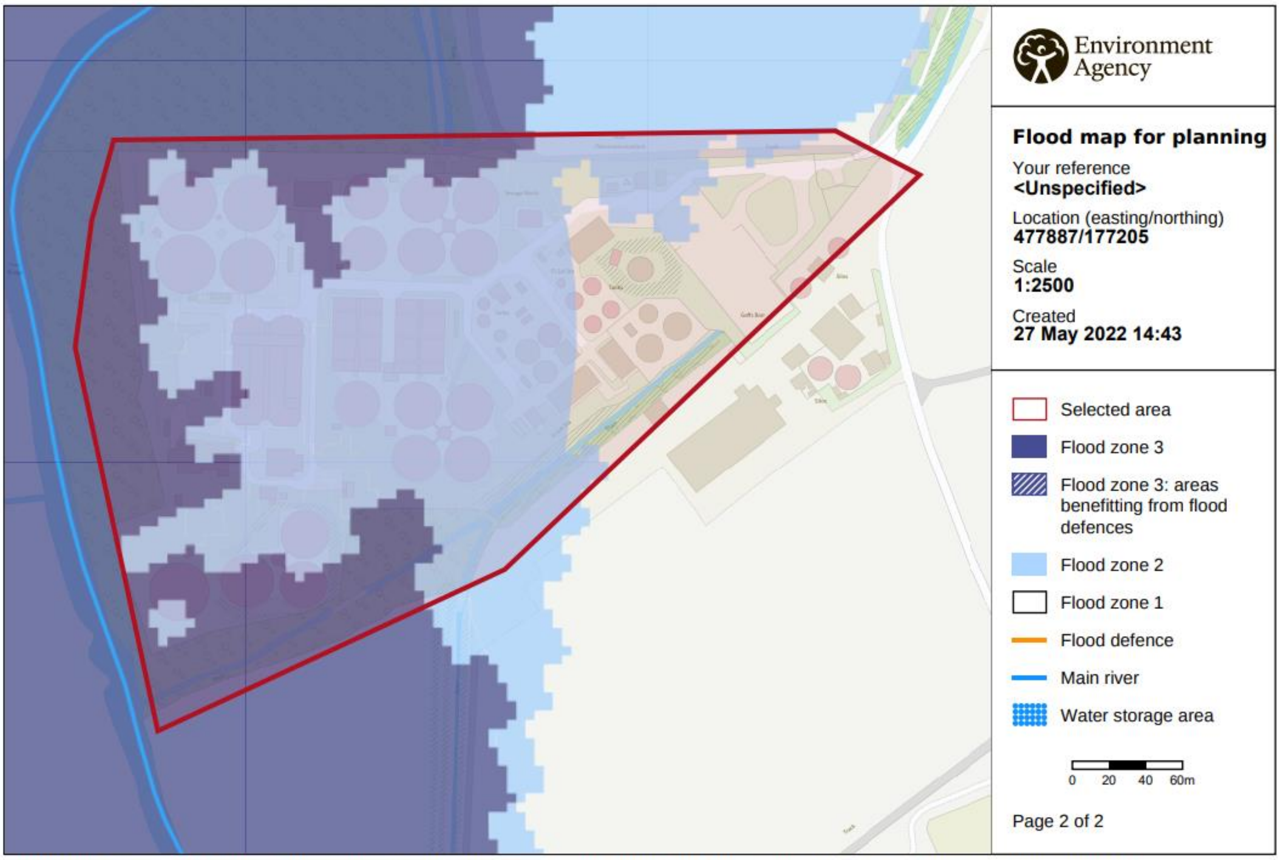


Figure 4.4 Extent of Fluvial flooding in Wargrave due to extreme weather events

4.3 Identification of Preferred Option

The preferred containment proposal is option 1 which considers the following advantages:

- Efficient use of assets/space (using roads and elevated areas to act as natural bunding)
- Practicality of installation (lower containment bund construction required)
- A lower bund wall will minimise long term site operational impacts including line of sight and ease of access.
- Access road operation simplified by use of ramps to cross containment lines rather than by the use of floodgates. Flood gates retained where exceptional access required.

4.3.1 H&S and CDM risks

- Flood gates not suitable for areas of high traffic movement
- Sealing of Cable ducts and fibre ducts to mitigate issue of acting as conduit to transport sludge around site.
- Confirm that the containment walls do not impact the existing DSEAR equipment rating.

5. Site Drainage and liquor returns

5.1 Process flow diagram

The process flow diagram is presented in Figure 5-1 below.

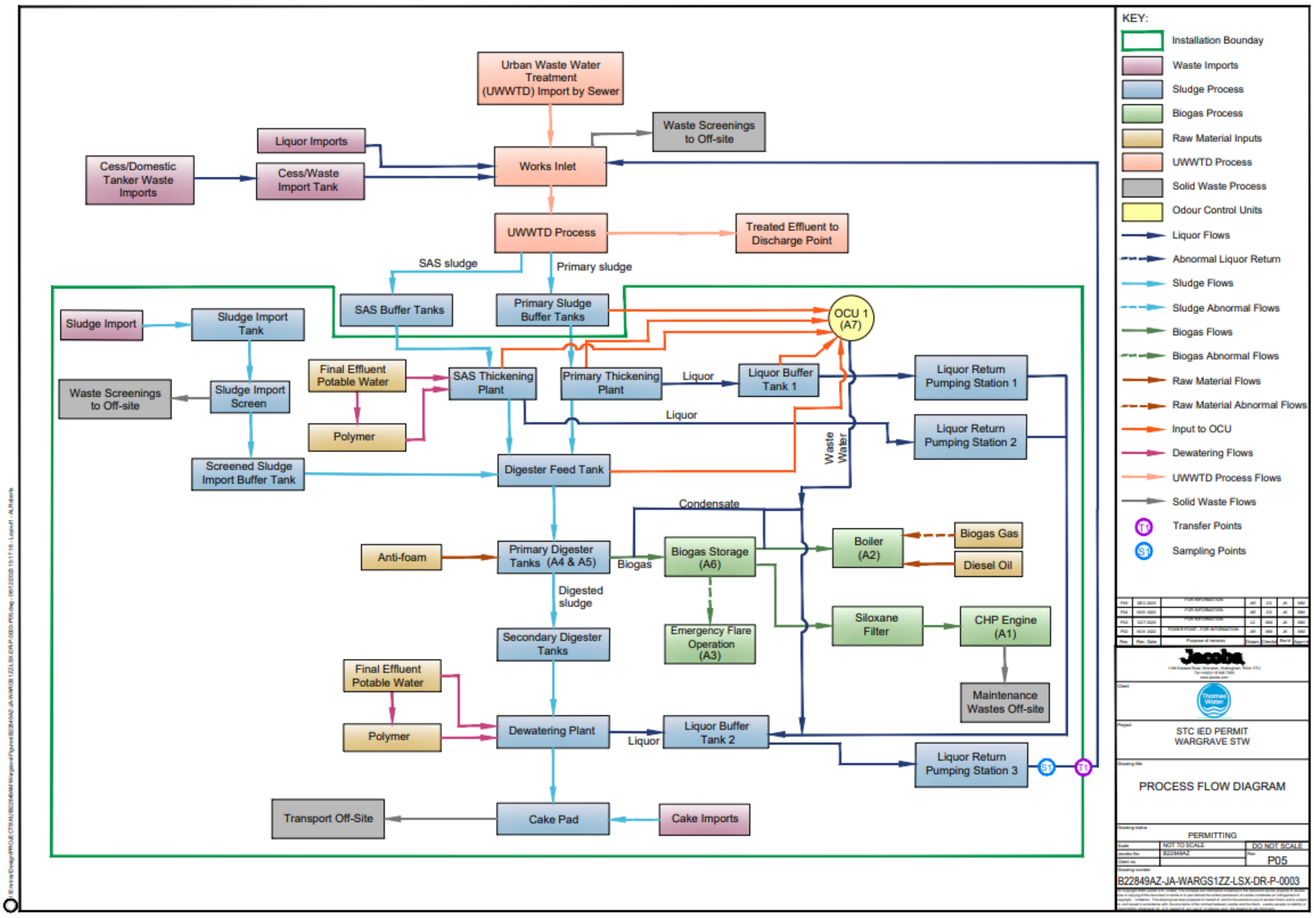


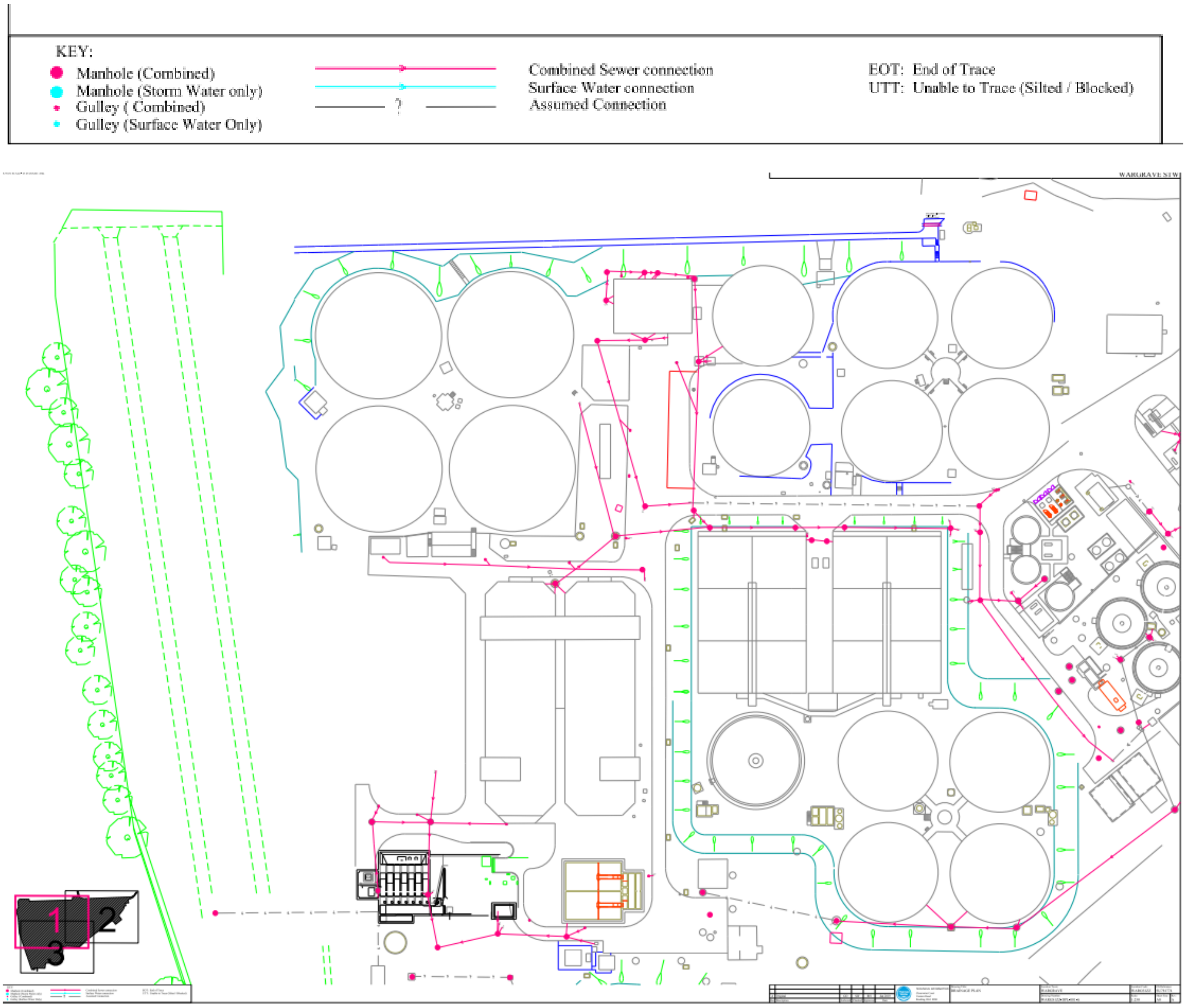
Figure 5.1 Process Flow Diagram

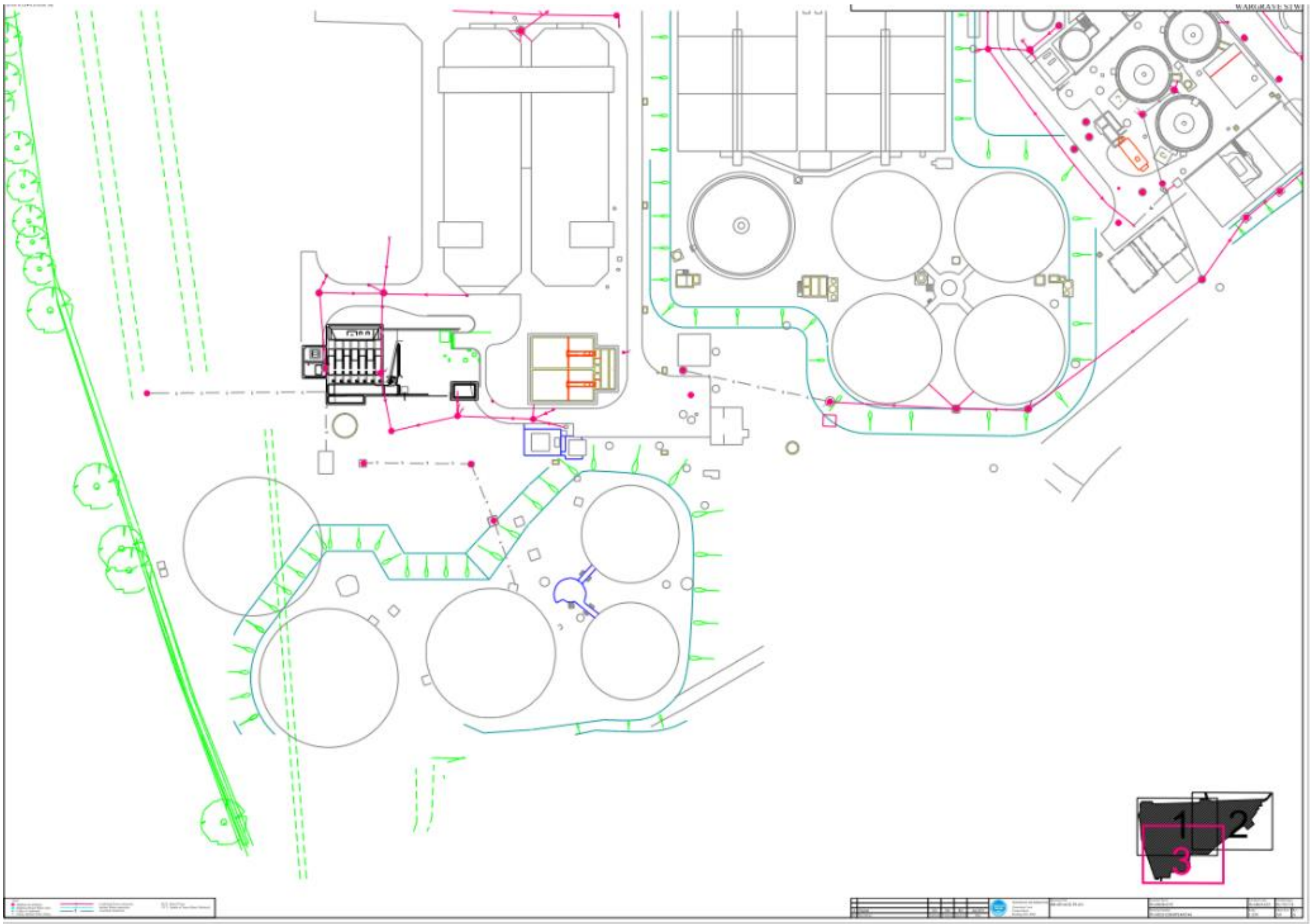
5.2 Foul, Process and Effluent Drainage

Site drainage assessments are based on Wargrave Sewage Works Layout Plan Drawing Numbers WARGS1ZZ-DPL-001 (three sheets)

The Sewage Works Layout Plan for Wargrave shows all Foul/ Combined/ Process/ Effluent drainage pipes, indicated by pink lines, go to the head of the works shown in Figure 5.2 below (split between pages). In the event of sludge entering the head of the works, the shock load could adversely impact the sewage works treatment process. Therefore, in the event of a catastrophic loss of containment, this line should be isolated or pumping should be inhibited.

The surface water drains, shown as the light blue lines, are also mixed with the process drains and go to the head of the works. As both systems combine, the surface water drains have been reviewed as part of this section.

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2
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Figure 5.2 Drainage plans

5.3 Liquor Returns

The existing liquor return system is not being altered by the containment system, other than the control modifications proposed in 5.4.

Details of the liquor returns sampling are being developed outside of this report for incorporation within the permit submission.

5.4 Automatic Isolation Valves

For the catastrophic loss of containment scenarios for Digester area discussed, such a loss could be automatically detected by the level sensors in the tanks. A catastrophic failure would be identified by the rate of change in tank level being larger than expected at normal operation. The signal from the sensors would be used to generate an alarm.

In the event of a catastrophic sludge spill, flows entering the head of the works via the drainage pipes could adversely impact the sewage works treatment process. Therefore, in the event of a catastrophic loss of containment, this line should be isolated.

It is recommended that float operated isolation valves are installed on all outgoing drainage lines from the containment area. These valves will remain normally open but will close when high levels in the existing drainage system are encountered. This drainage configuration will have the following impacts:

- In heavy or intense rain events these drainage isolation valves may be triggered, and operators onsite will need to manual operate these valves to release flows into the existing drainage network.
- In minor or slow flow tank spill events, the sludge spill will flow into the exiting drainage network (and into the head of the works) unless operators intervene to isolate the drainage networks. Due to the flow to full treatment at Didcot being large, minor spill flows will not adversely impact the process.
- In most locations, to accommodate the new isolation valves, new manholes need to be constructed over the existing drainage lines.

6. Conclusions

This section summarises the findings of the containment assessment options report for Wargrave Sewage Treatment Works.

Based upon the Anaerobic Digestion Bioresources Association (ADBA) containment assessment tool; the site carries an overall site risk rating of Medium meaning that Class 2 containment is needed.

The containment volume of 3855m^3 is driven by the 1-in-10-year, 8+1-day rainfall that could arrive during the clearing up period, which exceeds the 25% rule (25% of total tank volumes which includes allowance for rainfall) and the 110% rule (of the largest single tank).

The preferred option 1 has the following characteristics

- Low bunding around the wide containment area (500-1000mm high)
- Ramps at road crossings (1:20, 300-400mm high)
- Steps for preventing flow and allowing access at the same time.

The contained spill modelling retains the tank contents and associated rainfall within the site boundary and the flows can be managed by TW operations for return to treatment. Due to gradients across the site, water may pond to a depth of 1000mm, and alteration of road levels may be required to ensure critical plant can be accessed during the clean-up operation.

In addition to the containment elements, isolation of the site drainage system linked to the containment area will be required to mitigate the risk of unmanaged flows impacting the sewage treatment works. Existing gravelled and grass areas within the containment will be replaced with concrete. Elements of the site roads will be replaced/repaired to allow them to present an impermeable surface.

Freeboard allowances and the profile of the containment bund wall provides mitigation against surge effects. Jetting escape is mitigated due to the location of the tanks being remote to the containment boundary.

Appendix 1 ADBA Site Hazard Risk assessment summary for Wargrave STW

ADBA Industry Guidance and CIRIA C736 state how the site hazard rating of the site risk and classification are to be calculated. A summary of the hazard risks for Didcot STW are as follows:

Source – There are two sources that have been identified:

1. Sludge digestate
2. Polyelectrolyte chemicals (Ferric Sulphate) for sludge thickening.

The Source Hazard rating was determined as **High**.

Pathway – There are three pathways that have been identified:

1. The process and site drains take any liquid to the head of the works which would negatively impact the process stability on site and would eventually impact on the receiving watercourse.
2. Sludge treatment centre is integrated with large sewage works; as a consequence,

The Pathway Hazard rating was determined as **Medium**.

Receptor – There are two potential receptors which have been identified:

1. The site is within 245m of a populated area and within 50m of a number of warehouses.

The Receptor Hazard rating was determined as **Medium**.

Likelihood – The mitigated likelihood is **low**, which reflects the use of materials, the tank systems do not have a history of failure, the tanks are designed to British Standards and installed by competent contractors and Thames Water undertake regular site tours giving the opportunity to identify early indications of potential issues.

Based on the information above the overall site risk rating was calculated to be **Medium** which means that **Class 2 secondary containment** is required.