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**Sent:** 30 March 2021 17:29  
**To:** Planning.Responses <[Planning.Responses@arun.gov.uk](mailto:Planning.Responses@arun.gov.uk)>  
**Subject:** FW: Ford Airfield (Ref F/4/20/OUT) - Drainage Engineer Responses

Please could you upload the following e-mail and attachments to the application folder F/4/20/OUT as the applicants' response to ADC Drainage comments?

Thank you

**Raymond Cole**  
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**During this time there will be no public or staff access to any records held within this database, and it will not be possible to carry out any of the following tasks via the Arun website:**

- Research planning and building control history
- View any planning applications, plans, agreements, tree preservation orders or competent persons data
- Submit building control applications
- Submit planning application comments
- Report any planning compliance issues

**The publicity and consultation period for all planning applications that fall over this week will be extended by a further week to ensure no one is disadvantaged.**

**All other aspects of planning, building control and local land charges will be limited during this week and you are strongly advised to contact the individual departments before 12 April 2021 for specific restrictions during this time.**

**From:** Anthony McNevin [REDACTED]  
**Sent:** 30 March 2021 14:51  
**To:** Laura Gibbons <[Laura.Gibbons@arun.gov.uk](mailto:Laura.Gibbons@arun.gov.uk)>  
**Cc:** Raymond Cole <[Raymond.Cole@arun.gov.uk](mailto:Raymond.Cole@arun.gov.uk)>; Claire Potts <[Claire.Potts@arun.gov.uk](mailto:Claire.Potts@arun.gov.uk)>; Robin Shepherd [REDACTED] Jen Samuelson [REDACTED]; Robert Phelps [REDACTED]; Tarvit, John [REDACTED] Jon Regent [REDACTED] Craige Burden [REDACTED] Alan Brackley [REDACTED]  
**Subject:** Ford Airfield (Ref F/4/20/OUT) - Drainage Engineer Responses

Dear Laura

Thank you for your latest comments regarding the surface water drainage strategy for the Ford Airfield development (Ref F/4/20/OUT) following the additional information and updated design provided in JNP Group Drainage Strategy Technical Note Ref C85228-JNP-XX-XX-RP-C-1000-P2 dated 10 February 2021.

We provide our responses below inserted under each comment raised by ADC. Please advise if ADC would agree to an online Teams meeting to discuss the items raised in more detail and to better understand any remaining potential concerns or differences in option.

### **Comment 1**

The information submitted does not address our comments from 08/04/20 or 13/01/21. For example, the masterplan document states "In the southern area some limited ground remodelling is required due to the current height of the water table and topography. Therefore, we utilised the opportunity to redirect the surface water towards the area that is affected by odour issues, making the most efficient use of this otherwise non developable land". Drainage should not be moved around to fit in to space that cannot be used for housebuilding.

- 1.1 This comment is taken from the Masterplan document and not the FRA Report or Drainage Strategy Technical Note (DSTN). The comment has not been provided by a drainage specialist and merely tries to highlight that the proposal is an efficient use of space on site.
- 1.2 We confirm that the drainage has not been moved to fit into a space that cannot be used for housebuilding.
- 1.3 Section 3.1 of the DSTN clarifies that drainage strategy has guided the conceptual design for the development masterplan. This was presented to David Easton at ADC offices on 7 May 2019. We reissued JNP Drawing C85228-SK130 in Appendix B of DSTN which shows how the development site has been assessed for existing drainage and points of connection.
- 1.4 The FRA report included Sketch C85228 SK120. Sections 10.7.12 to 10.7.15 clarify that locating a basin or conveyance channels in the west of the site would:
  - Require the west and south of the site to be raised in level to avoid groundwater ingress into the drainage features.
  - Require the site to be raised in level to allow a gravity connection to the watercourse at Yapton Road (with the outfall above existing water level in the watercourse)
  - Would require significant earthworks and ground raising across the south of the development.

### **Comment 2**

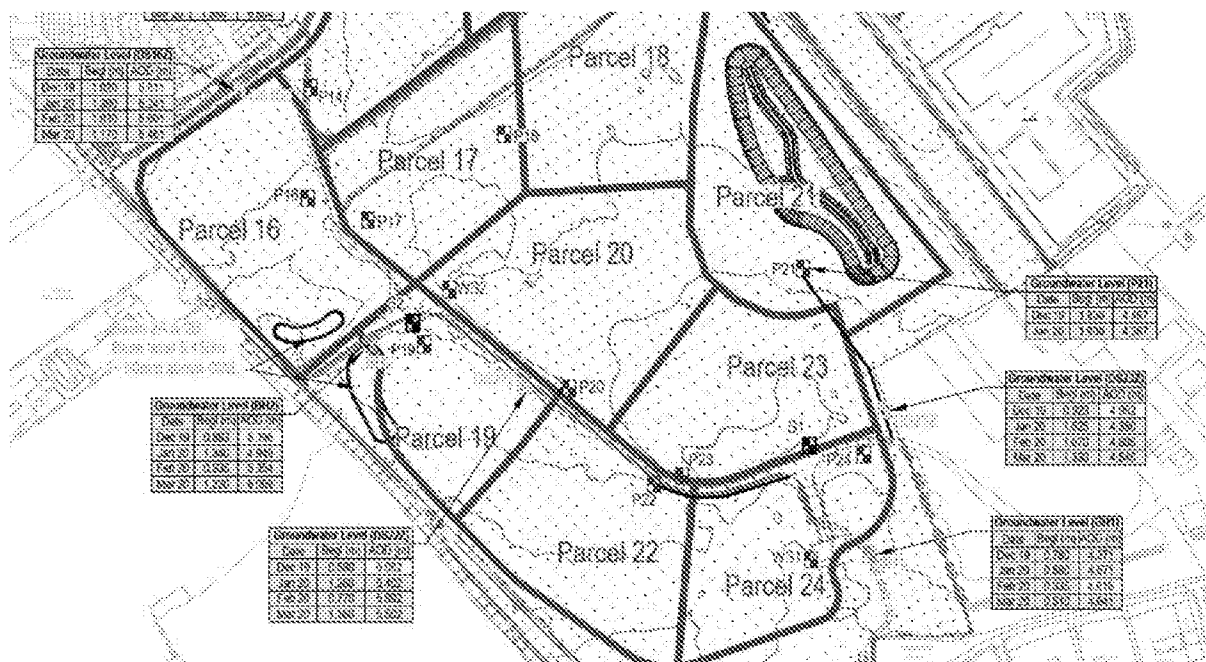
The proposals for attenuation and pumping of this area of the development do not comply with adopted WSCC policy for the management of surface water, specifically policy 3- mimic natural flows and drainage flow paths. No evidence has been submitted to show why compliance with this policy requirement cannot be achieved. The natural catchment appears to indicate this area should drain toward the watercourses under Yapton Road. We do not support drainage proposals which do not follow existing catchments or look to utilise pumping.

- 2.1 JNP Drawing C85228-SK130 summarises the direction the ground falls across the site. For the avoidance of doubt the natural ground surface profile in the north of the site falls to the northeast. In the south of the site the ground surface generally falls to the west/ south west.
- 2.2 JNP Drawing C85228-SK120 reviews the ground surface across the south of the site in more detail. It highlights that there are numerous depressions across the south of the site which collect surface water runoff, reducing the flow westwards
- 2.3 Groundwater monitoring, at relatively shallow depths, proves that groundwater flows northwards beneath the site.

2.4 The impact of the runways, access roads and existing surface water sewerage systems onsite which historically (for over 70 years) have captured surface water runoff and discharged it to the River Arun in the east should not be ignored.

2.5 The proposed drainage design strategy does discharge the westerly parts of the site to the watercourses under Yapton Road. The design mimics the current surface water runoff regime at the site.

2.6 The groundwater in the west of the site is extremely shallow. With reference to the monitoring results below it was less than 1.0m below ground level over the winter. The attenuation basin was located to Parcel 21 where groundwater is circa 1.9m below existing ground level over the winter period. This provides a more robust design for the south of the development.



2.7 The watercourse under Yapton Road / Horsemere Green Lane has a bed level of 3.03m AOD and a recorded water level of 4.00m AOD. The ground level at the western boundary of the site, nearest to the watercourse is circa 4.8m AOD. Groundwater has been recorded onsite less than 0.5m below the ground surface. Using open channels and basins in the west of the site is not feasible due to the risk of groundwater ingress. It is considered a pumping solution or significant ground raising would be required if the surface water runoff from all areas in the south of the development is directed to the Yapton Road watercourses.

### Comment 3

Clear existing catchment boundaries along with calculations for existing greenfield runoff rates for these catchments should be provided. Where it is demonstrated that infiltration is not possible we will expect to see discharges following these natural catchments. Infiltration should be used to its maximum potential. There are areas within the regions proposed for attenuation that appear to have ground conditions which would permit the use of infiltration.

3.1 The Greenfield Runoff Rate is discussed in Section 8 of the FRA with the calculation provided in Appendix C. Section 11 of the FRA advises how Greenfield Runoff Rate has been applied to each drainage system and outfall which serves the development site.

3.2 Both the FRA and DSTN provide drainage design calculations and a surface water drainage areas drawings which measure each development parcel based on 60% impermeable area and clarify where surface water from the development will discharge to.

3.3 Greenfield Runoff Rate at each outfall is based on  $Q_{bar}$  (l/s/ha) multiplied by 60% impermeable developable area in ha. It will be subject to remeasurement as more accurate site plan drawings become available during detailed design.

3.4 Regarding the use of localised infiltration Section 11.5 of the DSTN advises “the flat ground and high groundwater (in the south of the site) does not allow for a robust infiltration solution. Flood routing for exceedance flows would be a particular concern”.

#### **Comment 4**

We note that the northern infiltration basin is proposed to have a base level of 2.45mAOD. There are two equidistant monitoring points from the proposed basin location, one of these recorded groundwater at 3.053m AOD. The proposed basin level therefore appears to be too low, without further evidence to the contrary. This will impact upon the upstream network, and may mean that a larger basin plan area is required. Groundwater monitoring at the location of proposed features will be required.

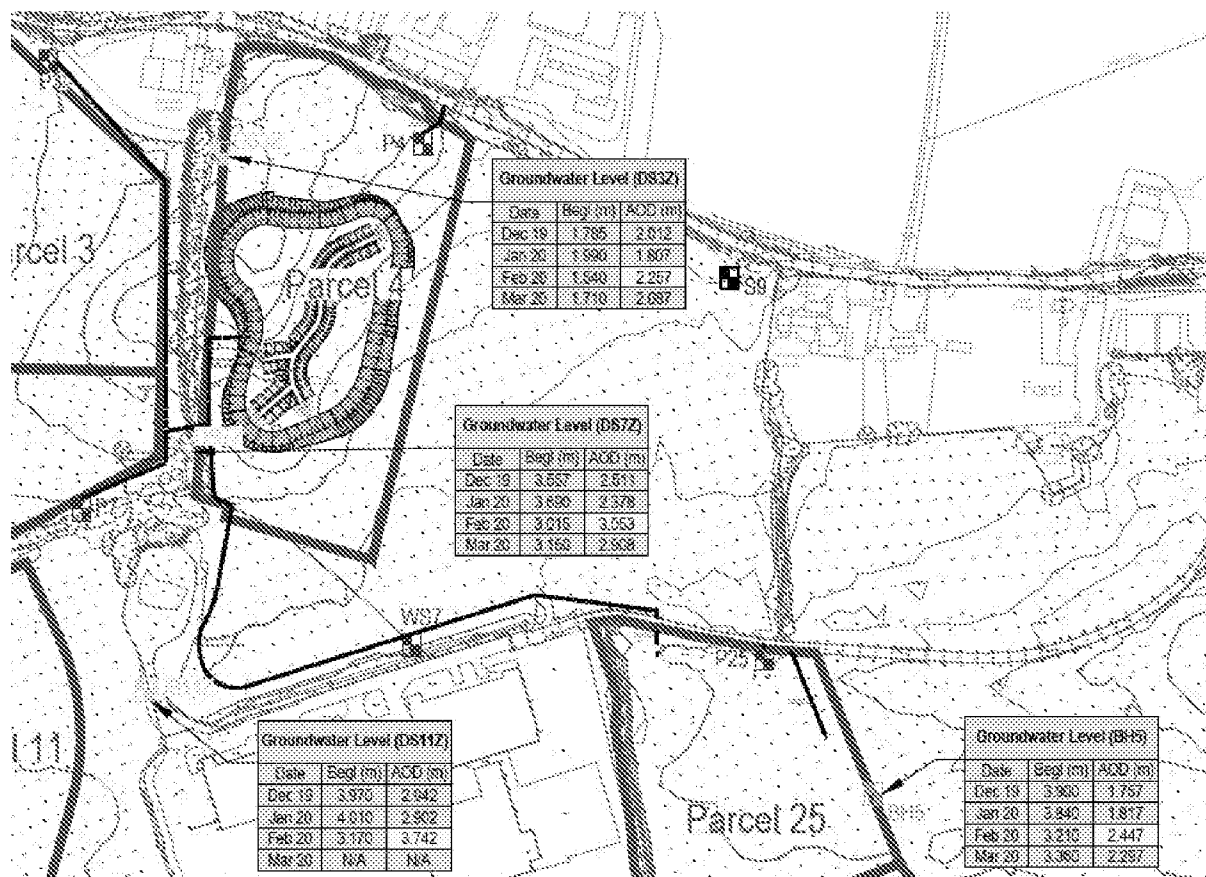
4.1 The groundwater monitoring of all wells across site show that groundwater flows northwards. In the north of the site the difference in water levels and the hydraulic gradient is significant. Water flows through the ground with the groundwater level deepening over short distances. The following extract from JNP Drawing C85228 D109E provided in the DSTN shows this.

4.2 Above ADC has highlighted the worst cast groundwater level in the monitoring well, to the south of the basin, is 3.050m AOD. The well to north recorded 2.257m AOD. The base of the basin is specified as 2.450m AOD. This diagram was included in Section 7.5 of the DSTN which advised “ the proposed base level of 2.450m would reduce the risk of groundwater ingress into the basin based on the worst case winter results taken during a significantly wet period”.

4.3 Due to the flow of groundwater through the underlying strata it does not appear that groundwater will pond in the basin. The groundwater levels recorded during the wettest winter period show groundwater is not level and is not static.

4.4 Section 7.8 of the DSTN confirms that basin has a 670mm freeboard to the crest of basin. The nearest plot FFL is 600mm higher than the crest of the basin. If groundwater is present in the base of the basin there is significant additional attenuation capacity.

4.5 We do not recommend the base of the basin is raised as this will increase the level of the incoming sewer network and ground levels across the north of the site. This will impact on earthworks and increase the volume of imported fill. The proposed solution and base level of the basin is the more sustainable option.



## Comment 5

The development layout should not be agreed until such a time that there is a workable and substantially agreed surface water drainage scheme.

- 5.1 The outline planning drainage strategy design has been provided in reasonable detail for agreement. The JNP drainage strategy provides a robust solution.
- 5.2 We reviewed alternative options in the FRA and DSTN and provided reasons why they should not be implemented.
- 5.3 ADC appears to still favour discharging surface water to the west of the site by gravity, where groundwater is highest, using open attenuation channels and swales with infiltration provided where feasible with high level overflows into a attenuation system. We do not consider this is viable over the large distances across the site without the need for raising ground levels across the south of the site or pumping surface water offsite. We query if discharging surface water, from such a large development, to areas where groundwater is an issue is a suitable solution.

## Comment 6

We also wish to raise our support for the concerns raised by Southern Water on the 20<sup>th</sup> January and the Environmental Health Officer. We do not believe the development proposals give adequate consideration to the future operation of the treatment works. It is highly likely that the treatment works will need to be expanded.

6.1 The Southern Water response dated 19 January 2020 (we presume this should be 2021?) appears to only address odour issues and is in response to the Environmental Statement.  
6.2 The comments do not relate to the Flood Risk Assessment or Drainage Strategy.  
6.3 JNP has been liaising with Joff Edevane, Growth Planning Lead at Southern Water. Southern Water has agreed to providing a corridor route to the west of the wastewater treatment works to allow future pipelines to access the works. This has been provided on the masterplan.  
6.4 Southern Water confirmed by email dated 20 December 2019, that there is no need for a sewer capacity check if flows are taken directly to Ford WWTW. Southern water advised that the treatment works has capacity for the Ford Airfield development.

Please do not hesitate to contact us if you have any queries.

Regards

**Anthony McNevin**

Associate



**Brighouse · Chesham · Glasgow · Hartlepool · Leamington Spa · Sheffield**

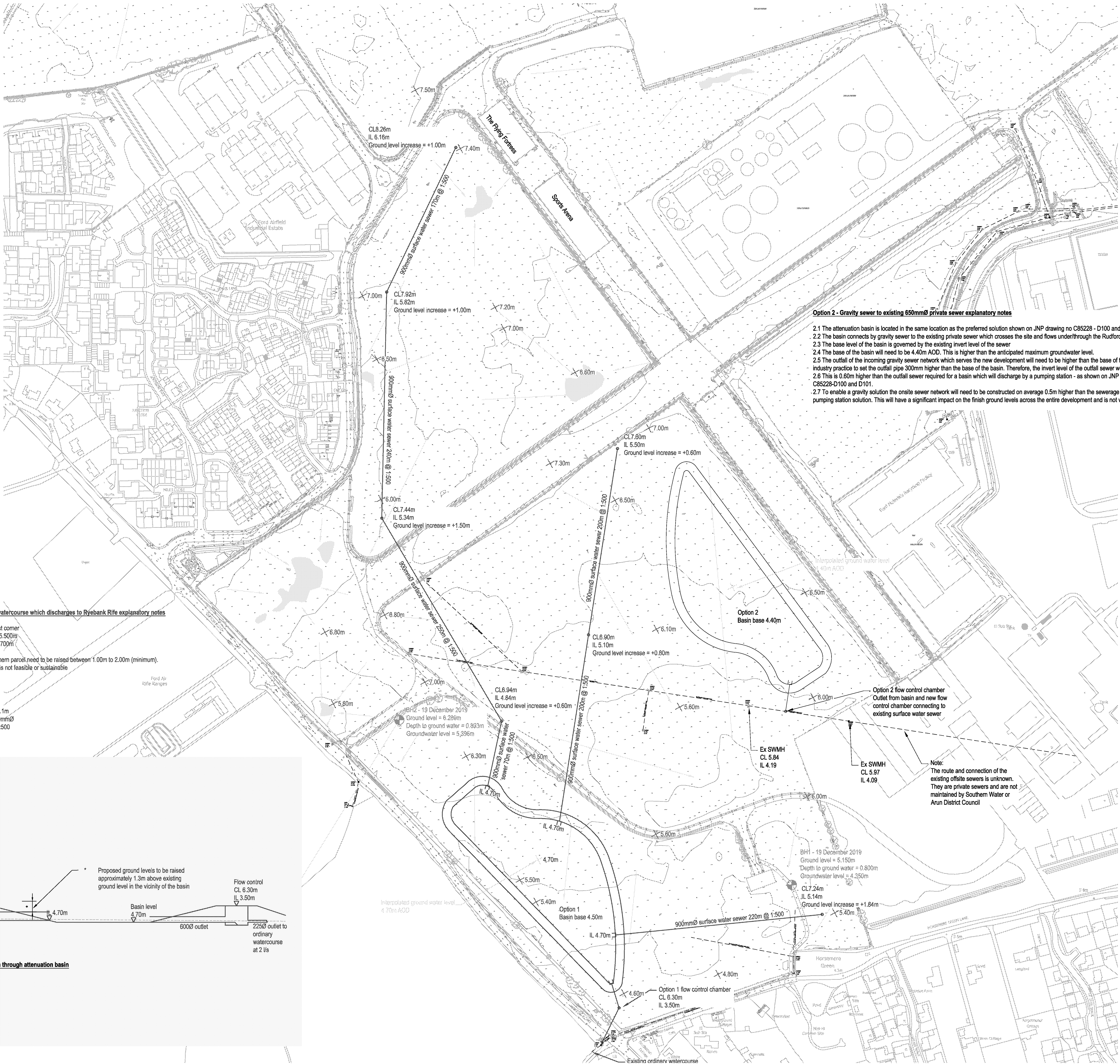
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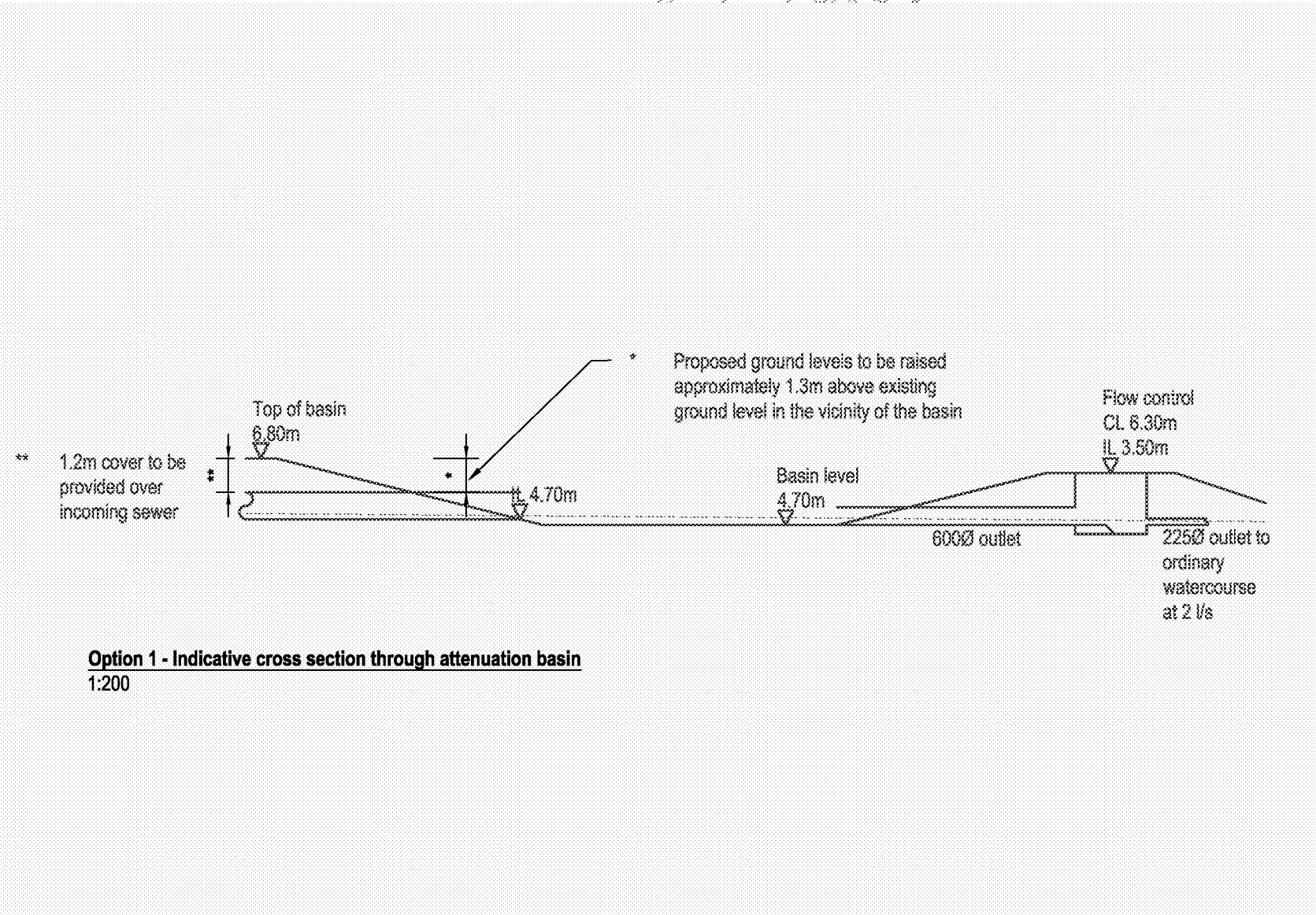


Option 1 - Gravity sewer to ordinary watercourse which discharges to Ryebank Rife explanatory notes

- 1.1 Locate attenuation basin in southwest corner
- 1.2 Approximate existing ground level = 5.500m
- 1.3 Interpolated design groundwater = 4.700m
- 1.4 Base of attenuation basin 4.700m
- 1.5 Ground levels across the entire southern parcel need to be raised between 1.00m to 2.00m (minimum). The earthworks required to achieve this is not feasible or sustainable

Option 1 - Assumptions

- Assumed depth of manholes are 2.1m
- Pipe diameters assumed to be 900mmØ
- Pipe gradients assumed to be 1:500
- 1.2m cover over sewers assumed



Option 2 - Gravity sewer to existing 650mm private sewer explanatory notes

- 2.1 The attenuation basin is located in the same location as the preferred solution shown on JNP drawing no C85228 - D100 and D101
- 2.2 The basin connects by gravity sewer to the existing private sewer which crosses the site and flows under/through the Rudford Industrial estate
- 2.3 The base level of the basin is governed by the existing invert level of the sewer
- 2.4 The base of the basin will need to be 4.40m AOD. This is higher than the anticipated maximum groundwater level.
- 2.5 The outfall of the incoming gravity sewer network which serves the new development will need to be higher than the base of the basin. It is standard industry practice to set the outfall pipe 300mm higher than the base of the basin. Therefore, the invert level of the outfall sewer would be 4.70m AOD.
- 2.6 This is 0.60m higher than the outfall sewer required for a basin which will discharge by a pumping station - as shown on JNP drawing No. C85228-D100 and D101.
- 2.7 To enable a gravity solution the onsite sewer network will need to be constructed on average 0.5m higher than the sewerage system required for the pumping station solution. This will have a significant impact on the finish ground levels across the entire development and is not viable.

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Legend

- Site Boundary
- Existing ground levels (m AOD)
- Indicative overland flow direction
- Indicative existing overland flow low lying areas onsite
- Indicative gravity sewer network for option 1 to illustrate required ground level increase in order to achieve gravity sewer network

| Rev.       | Date     | Amendment                                                      | By | Chk. |
|------------|----------|----------------------------------------------------------------|----|------|
| D          | 13.02.20 | Drawing updated with latest groundwater monitoring information | MF | AM   |
| C          | 19.12.19 | Site boundary revised                                          | IS | AM   |
| B          | 24.10.19 | Site boundary updated                                          | IS | AM   |
| A          | 09.07.19 | Site boundary updated                                          | IS | AM   |
| Status     |          |                                                                |    |      |
| Indicative |          |                                                                |    |      |



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|                          |                                               |
|--------------------------|-----------------------------------------------|
| Client                   | Wates<br>Redrow                               |
| Job                      | Ford Airfield                                 |
| Title                    | Drainage Solution Options<br>Southern Parcels |
| Scale                    | 1:2000 @ A1 Date March 2019                   |
| Drawn by                 | IS                                            |
| Checked by               |                                               |
| Approved by              |                                               |
| Drawing No. C85228-SK120 |                                               |
| Rev.                     | D                                             |



## **Southern Water's response to Arun District Council's consultation on further information in relation to the Environmental Statement on application F/4/20/OUT**

Southern Water owns and operates Ford Wastewater Treatment Works (WTW), adjacent to the proposed development area. With reference to paragraph 2.16 of the Environmental Statement Addendum, which states that no response has been received from Southern Water, we confirm that on 27 November 2020 we sent a further response to Hoare Lea's letter dated 5 November 2020. A confirmation of receipt from Hoare Lea on 2 December stated the following:

*"We will review the document and discuss with our project team and will be in touch in due course regarding how we propose to progress."*

No further responses have been received and to our knowledge, no revisions have been made to the odour assessment submitted as part of the planning application submission. As such, we regard issues raised in previous reviews as remaining largely unresolved and potentially significant.

### **Summary of Concerns**

The submitted masterplan uses the odour contours, as presented in the February 2020 odour assessment, to define areas suitable for development. The transposition of data from the odour report to inform that masterplan is acceptable, i.e. the use of Southern Water's suggested odour criterion.

Atkins' review, however identified several points of contention or clarification and the odour assessment deviates from what Southern Water would consider an appropriate assessment. A robust and conservative assessment is considered essential on the basis that on-site odour emissions were estimated and not measured.

Southern Water is yet to receive a response on how these aspects are intended to be addressed.

Although not exhaustive, the following aspects are potentially major concerns and are, as of the close of the consultation period, unresolved.

#### **1. Source Emissions – Odour Control Units (OCU)**

The assessment understates odour emissions. Modelled emissions were between 10-25% of typical emission concentrations from single stage OCU units.

#### **2. Source Emissions – Area Sources**

The assessment understates odour emissions. Modelled emissions from the largest odour emitting area source, the Activated Sludge Plant (ASP), are not considered to be conservative. The selected emission rates are classified as 'Low' when compared to the commonly adopted UKWIR wastewater odour emission rates. Actual emissions may reasonably be twice the modelled value in line with 'typical' emissions defined by the UKWIR research.

#### **3. Source Emission Sizes**

The dimensions of the modelled emission sources are approximately 10% smaller than actually on the site.

**4. Meteorological Data choice**

Results of a meteorological sensitivity study has been requested to ensure that the chosen meteorological data is appropriate.

**5. Cumulative impacts**

The cumulative impact of odour from the WTW and surrounding industrial uses has been discounted within the Environmental Statement Addendum. We feel it is optimistic to assume that any environmentally permitted facility will be completely odour free and would encourage the Council to take a pragmatic view regarding the potential for cumulative impacts.

**6. Future WTW expansion**

Arun Local Plan (2011-2031) Policy H SP2c site allocation SD8 at Ford states that development proposals must demonstrate compliance with requirement (j), to *'...not prejudice the operation of or the expansion of the treatment plant as required to accommodate future growth in the District.'*

We have found no evidence that any consideration or allowance has been given to the potential future operation of the works.

As a result of housing growth allocated in the Arun Local Plan, Ford WTW will receive a higher loading of wastewater flows which may generate additional odour emissions from the site. In an email to the Council from the Environmental Health Officer dated 28 August 2020 it was stated that *'any further developments at the existing WWTW could not occur if this means there is an increase to the odour loading. This approach will mean there are significant planning policy decisions and a strategic overview that needs to be considered. Allowing the houses as part of this development so close will curtail and restrict any expansion of the WWTW'* Southern Water shares this concern and is therefore keen to ensure that current proposals are required to address the above mentioned policy criterion of the Arun Local Plan.

The need to consider such matters is also a requirement of the NPPF paragraph 18 which states that *'existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established'*.

Each of the above-listed items is likely to result in either an increase in the size or shape of the odour contours used to inform the proposed development masterplan layout. As such, the proposed masterplan in its current form may result in placing sensitive receptors in an area where odour impact and complaints may be expected to occur.

As the results are marginal, we recommend that a site survey and revised odour assessment are conducted prior to the approval of the outline planning application, using the more conservative assessment parameters recommended by Southern Water. This will help to ensure a sound and sensible approach is taken to safeguarding Ford WTW's ability to continue to accommodate future growth in Arun district.

