VEOLIA WATER PROJECTS LIMITED

PR19: WATER INDUSTRY STRATEGIC ENVIRONMENT REQUIREMENTS (WISER)

FOR THE PERIOD 2020 TO 2025

INTRODUCTION

Veolia Water Projects Limited [VWPL] was granted the status of Appointee and thus Water and Sewerage Undertaker for the operating area described as Tidworth, Perham Down and Ludgershall [part] on the 2 June 2009 succeeding Thames Water in the role. The Appointment came into effect on 8 June 2009.

As such VWPL have to mirror the Wessex and Southern Water tariffs and thus are not involved in the normal Price Review process. However, VWPL recognises the importance of the environment in the business plan and asset management plan. Therefore VWPL have provided a simplified response, drawing upon the content of the Water Resources Management Plan (WRMP) and Drought Management Plan (DMP).

This report considers:

- How company activities map to WISER expectations
- How strategies and investment will eliminate serious pollution and meet compliance in terms of permits and licences
- How VWPL will to the best of its ability deliver improvements in to the environment in line with WISER
- How this aligns with the WRMP
- How VWPL will improve resilience as a result of its investment
- Innovation and ‘partnership working’ as the business plan is implemented
- Example of activities that move forward the strategy in line with WISER

As always VWPL will welcome feedback on the contents of this report with the aim of continuing to improve performance.

1 ENHANCING THE ENVIRONMENT

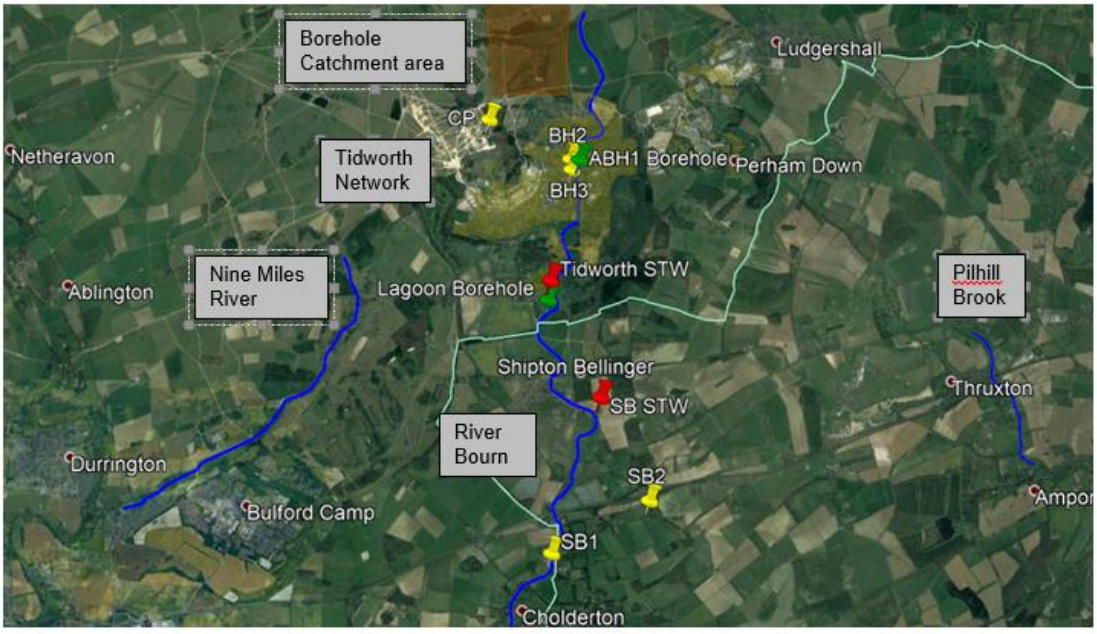
The WISER process aims to act as a strategic steer for the water industry to ensure that their business plans for 2020 to 2025 (PR19) adequately consider the environment, resilience and flood risk.

WISER is issued jointly by the Environment Agency and Natural England. It replaces the DEFRA Statement of Obligations and the Environment Agency letter of expectations issued for PR14.

VWPL operates as an appointee for providing water and waste water services within the Tidworth and Perham Down area. As such VWPL must mirror Wessex and Southern Water tariffs and so does not follow the normal Price Review (PR) process. However, Veolia supports such a process and therefore has endeavoured to follow the WISER guidance as closely as possible, given the differences between regulations in regards to appointees and the larger water and waste water companies.

1.1 WATER BODY STATUS

VWPL have identified upstream and downstream impact areas in relation to abstraction of potable water and the discharge of waste water:



Ground water table levels are monitored to ensure that levels do not drop low resulting in the trigger of drought bands as per the drought management plan.

An upstream risk assessment of the borehole catchment area indicates the existence of only one farm. The majority of the catchment falls within the Tidworth MoD firing range and so the use of pesticides is limited in this area.

Waste water is discharged into a series of lagoons south of Tidworth which act as an environmental barrier, minimising the downstream impact to the River Bourne. The STW's at Tidworth has recently been upgraded to meet the terms of a new discharge licence.

The impact of abstraction in relation to Nine Miles river is achieved by running boreholes 2 and 3 at a higher rate than Chalk pit borehole. An assessment as part of the Water Industry National Environmental Programme (WINEP) is underway with the Environment Agency to ensure that the production of water is correctly balanced from the sources to minimise the risk to Nine Miles, the River Bourne and Pilhill Brook.

1.2 BATHING WATERS

VWPL covers an inland region and so does not have a direct impact on bathing water performance.

1.3 SHELLFISH WATERS

Not applicable as being land locked supply area there is no impact on shellfish waters.

1.4 BIODIVERSITY AND ECOSYSTEMS

Biodiversity has been indicated as a concern by Natural England and the Environment Agency.

As part of general housekeeping a system has been put in place by VWP to constantly review health and safety aspects during site visits. This will be extended to include environmental observations. Environmental awareness training has been delivered to operational staff.

Nine Miles River is a SSSi site and VWPL activities in terms of favouring Boreholes 2 and 3 over production of water at Chalkpit minimise impact on this area.

Risk assessments prior to operational work include an environmental assessment and any work that is likely to impact on the environment is communicated to the EA to obtain a permit to proceed with the work if required.

1.5 SUSTAINABLE FISHERIES

There is only one known fishery potentially in range of VWPL operations, a trout fishery located at the southern end of Pilhill Brook called Amport Trout Fisheries.

From initial EA ground water modelling, if VWPL abstract 100% licence from boreholes 2 and 3 then there could be a slight impact (2% the result of VWPL and 98% due to Southern Water abstraction) of the flow in Pilhill Brook. This

forms part of WINEP and the resultant investigation needs to balance the needs of Nine Miles River with that of Pilhill Brook.

There is no evidence of a problem with water levels at Amport Trout Fisheries and VWPL impact is likely to be insignificant.

1.6 INVASIVE NON NATIVE SPECIES (INNS)

The same comments apply as for section 1.4.

Most risk associated with pathways of introduction and spread would seem to be vehicular in nature. Due to VWPL operating both water and waste water sites great care is taken to prevent cross contamination between the two systems in terms of vehicles and access to site. This goes someway to helping prevent the transport of INNS.

The River Bourne does not run all year and the fencing to the south of Tidworth local to the STW's provides a barrier against the transport of INNS via water bodies. There are no Veolia upstream facilities that could transfer INNS into this body of water.

1.7 URBAN WASTE WATER

As part of the Small Company Annual Return VWPL report on:

Sewer Flooding:

No internal sewer flooding of properties was reported since the date of its Appointment. There were two reports of external flooding of civilian properties and 10 blocked drains for the reported period of 2017/18.

Pollution Incidents – Sewerage:

There have been no internal or external sewer flooding in the Military Areas of the Tidworth PFI since the date of the VWPL Appointment.

VWPL has captured the total number of sewer surcharges across the Tidworth Area but due to the integral nature of the foul water networks with those of the MoD it has not always been possible to accurately differentiate pollution incidents into those solely involving Regulated Customers.

From the VWPL Contact Management System there were no Regulated Civilian properties have reported manhole surcharges in the period 2017/18.

Serious Pollution Incidents:

All surcharges are localised to the manhole and minimal subsequent clean up supports the contention that none of the above reported surcharges were serious in nature.

The Waste Water Treatment Works has operated well in the period although very high winter flows of final effluent have impacted the lagoons and their ability to soak away effluent to ground. Close liaison with the EA produced a workable mitigation involving effluent pumping to adjacent permeable land within the works site. Work is proceeding to model the performance of the lagoons so that scenarios can be run to reinforce the observations that it is possible to manage the levels in the lagoons with no environmental risk.

Therefore VWPL can report that there were no Serious Pollution incidents in the period 2017/18.

1.8 DRINKING WATER PROTECTED AREAS

VWPL has no drinking water protected areas, however the catchment area for the abstraction boreholes 2, 3 and Chalkpit has been identified.

Pesticide levels are being monitored and show a downward trend. Filter (GAC) treatment remains in place at Boreholes 2 and 3 due to the low cost of operation when compared to the benefit in terms of resilience of supply.

The likely reason for the downward trend is the reduction in pesticide use by farmers and also by the MoD. The MoD historically used pesticides as a tool to keep security fencing clear of encroaching plant life. However, this has been discontinued. As the majority of the catchment area to the boreholes covers a firing range and the associated security fencing the reduction in pesticide use by the MoD has had a positive impact in downstream water quality.

1.9 CHEMICALS

The primary chemical usage is involved in the Chlorination process. The Chlorination treatment at Chalkpit has been overhauled and the reliability of production at this site has improved as a result. The new treatment process is likely to be more efficient.

The storage of chemicals has been considered in relation to the Security Emergency Measures Directive (SEMD). Although VWPL do not hit the trigger of 25,000 population for enhanced SEMD processes to take effect VWPL continue to consider the implementation of systems that will improve health and safety and resilience of the network.

2 IMPROVING RESILIENCE

Due to the fact that VWPL network consists of:

- A single supply zone, by definition having no backup connection from a neighbouring zone
- A network supplying several large MoD garrisons
- Is at this time the only appointee that produces water and exports potable water to a neighbouring water company (Wessex)

Veolia place significant emphasis on resilience and removing single points of failure.

Although VWPL supply less than 25,000 population SEMD options are being actively considered for implementation. Risk assessments are proceeding to identify single points of failure, not just on the network, but also process and staff training and availability.

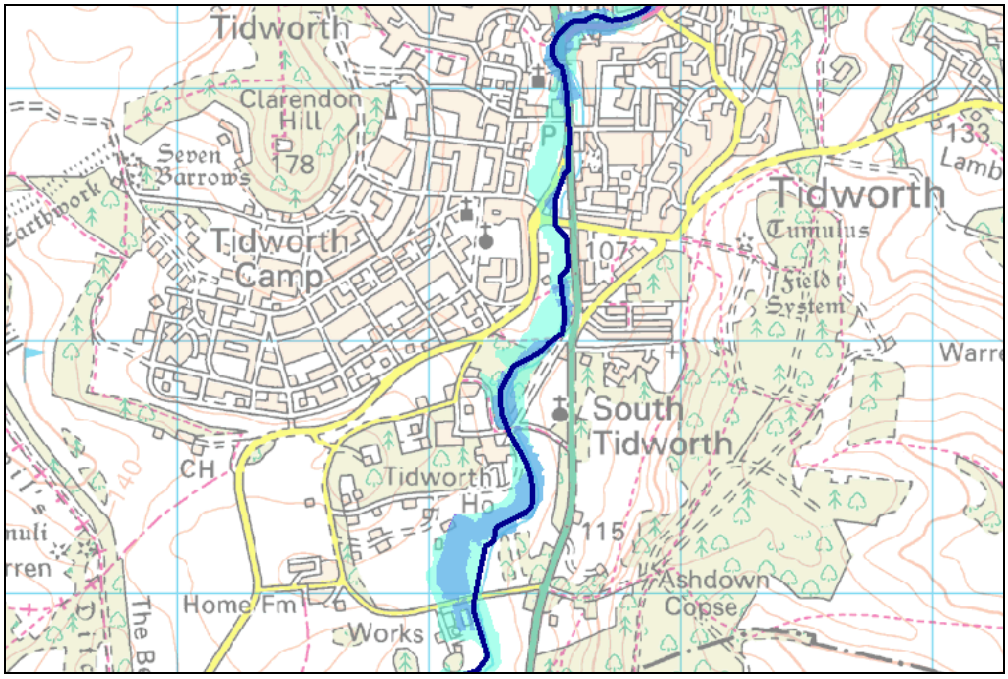
2.1 FLOOD RISK MANAGEMENT AND RESILIENCE

According to the EA regional flood model maps produced for Tidworth, none of the clean water Above Ground Assets (AGA's) are at risk from a flooding event. All Below Ground Assets (BGA's) are resistant to the effects of flooding (all gravity fed network) with the exception of accessing them in the event of an extreme flood in the areas highlighted in the diagram below.

Several waste water assets are at risk of flooding. Two pumping stations are very low risk due to their position in the 1 to 100 year (+) zone. Actions could be taken to minimise their use and make alternate arrangements such as tankering of sewage. The STW is a slightly greater risk as it sits in the 1 in 75 year zone (1.3% chance).

The probability of an impact of flooding is therefore low, but the impact could be high. Therefore these risks will be added to the company risk register allowing for criticality scoring against other company risks.

Locations at risk of flooding



2.2 SERVICE RESILIENCE

VWPL nor its predecessors have had occasion to resort to any form of restrictions [formal or informal] in over 15 years including through recent drought conditions in 2006/07 and 2018/19 when many water companies' sources in Southern England were under extreme pressure.

Level of Service offered by VWP to all Regulated Customers – Historical and Future.

Zone	Situation	Impact to Customers	Probability	Historic Events
1	High Demand	No restrictions	1 in 5 years (20%)	0
2	2 years of High Demand	Proactive approach to water efficiency	1 in 10 years (10%)	0
3	Temporary Ban	Hosepipe Ban	1 in 50 years (2%)	0
4	Drought Order	Possible rota-cuts in worst case scenario	1 in 200 years (0.5%)	0

There has been no evidence of water restrictions in the Tidworth area. The probability of future events has been based upon 100 years of rainfall data history which has then been used to predict likely impact on the ground water table. The water network has been sized in many cases to meet Crown Fire Fighting standards and so there is no obvious restriction in terms of capacity of the network to meet the needs of the customers. Refer to the drought management plan for further information.

There was an apparent high demand situation that occurred from 1st June to 19th June 2017 which corresponded with record breaking high temperatures. Clarendon reservoir level reduced as demand exceeded available supply. All

customers received adequate supplies during the event with no need to implement the drought management plan.

A subsequent investigation revealed a number of reasons for this high demand event which are not attributed to normal peak demand conditions:

- Work had commenced on installing improved treatment facilities at Chalkpit and this impacted on the reliability of the output of the plant. This was resolved once the permanent treatment process was fully installed. Project work will not occur during periods of predicted high demand.

- Wessex Water took more water from the Leckford Bridge export than was being reported due to a burst water main. Closer communications with Wessex Water have been organised to allow better management of the transfer of flow with data being recorded daily.

- A 6 inch wheel valve was subsequently discovered to be fully open allowing in excess of 1 Ml/d of water to escape in an uncontrolled fashion to a vehicle washing facility within the military complex. All such valves have been locked to prevent unauthorised and wasteful operation.

- Better monitoring of existing telemetry data will provide early warning of problems with reliability at Chalkpit, increased Leckford Bridge export and significant non-legitimate demand occurring within the military facility.

2.3 FUTURE DRAINAGE

VWPL holds a Permit to Discharge treated foul sewerage effluent from its main Humber lane STW site.

VWPL having previously reached an agreement with the EA on the appropriate Consent for the Tidworth Sewage Treatment Works, are working to deliver a treatment regime that will achieve the new Consent that came into effect during December 2017.

Compliance samples continue to be delivered to plan and the annual performance of the STW's is being monitored to ensure that the new processes operate as planned.

The new treatment process is being optimised and storage is available on site to guard against sudden storm flows.

2.4 WATER RESOURCE PLANNING AND SECURITY OF SUPPLY

Refer to section 2.2 for comments regarding levels of service resilience.

Both the Water Resources Management Plan and Drought Management Plan have been submitted for public review and have recently been amended in response to that public consultation. Due to the size of the VWPL area of supply these documents will be in effect 'live' documents regularly reviewed to guard against sudden variations in demand which can occur due to the small network involved. For example, a single hidden burst main on the network can result in a significant increase in background leakage when compared to the size of the network.

The WRMP considered:

Current Supply / Demand situation – demand is increasing in line with predictions and the number of new connections added to the network is being compared with the prediction to ensure forecasts are accurate.

VWPL is able to meet its requirements to export water to Wessex via a connection called Leckford Bridge. Both Veolia and Wessex agreed the commentary to be added to their respective WRMP's.

Levels of Service as per section 2.2 are very much a worst case assumption being based upon borehole levels back to 1998 and rainfall levels to the start of the 1900's. Work will continue with assistance from the EA to find additional supporting evidence.

Customer engagement consists of quarterly meetings with the MoD, regular communication with Wessex to ensure WRMP's align and information made available online for domestic regulated customers to reference.

Deployable output of sources – water quality is improving and the drawdown of water in the boreholes appears to be of low risk based upon investigations into historic borehole depth, rainfall and the structure of the boreholes themselves.

Outage and headroom – this again is viewed as low risk, but high consequence. This risk is being mitigated by performing maintenance outside of high demand periods and the implementation of preventative maintenance tools and the provision of stores for high risk assets.

Climate Change – refer to section 2.5 below.

Vulnerability assessment – the boreholes are fed from a single catchment area, but the majority is within a MoD firing range. A single farm was observed and does not pose a risk to this single point of failure. Even so SEMD protocols are being considered to mitigate against single points of failure.

Flooding – refer to section 2.1, risk is low.

Drinking Water Protected Areas – there are none, refer to section 1.8

Freeze / Thaw events – historically the mains have been laid at greater than normal depth due to the military nature of the area. Recent freeze / thaw events have not indicated any outbreak of leakage and so this is perceived to be a low risk.

Metering and efficiency – The area has close to 80% meter coverage and a process is in place to allow the small number of customers (approximately 200 properties) not yet metered to apply for a meter if required. Given the small number of properties in question universal metering is not being considered. Automatic Meter Reading (AMR) is already deployed and used for the gathering of metered usage.

Leakage – work continues to assess water used during hydrant testing (which is extensive given the need to meet Crown Fire Fighting standards due to the MoD nature of 50% of the network). The network is in a state of redevelopment as part of Army Rebasing 2020 and so new mains are being laud that result in operational water usage as new mains are flushed and old mains abandoned. Even so active leakage control has reduced leakage and consideration is being given to flow modulated pressure control so that pressures can be reduced at periods of low demand, but will be increased as demand increases (including if needed for fire-fighting purposes).

Greenhouse Gas emissions - The energy required to produce and distribute water through the Tidworth network is approximately 170,000 kWh per year. Using a conversion of 0.527 kg CO2 / KWh the total CO2 emissions appear to be approximately 90,000 kg of CO2. Energy use going forward will be monitored and will form part of future WRMP commentaries.

Resilience – refer to section 2.2. The company are developing a Computerised Maintenance Management System (CMMS), implementing elements of SEMD and implementing advanced reporting such as Asset Health for both infrastructure and non-infrastructure assets.

List of proposed improvements that are being considered as part of the Asset Management Plan.

The DMP considered:

Water Resources – VWPL maintain a healthy supply / demand balance within the Tidworth area of supply.

Ground water safe zone – area identified and risks considered to be low as only one active farm is evident in this area upstream of the boreholes

Distribution System – Critical sites have been identified, but redacted from public consultation. These sites are being considered as part of the ongoing SEMD assessment with appropriate security due for implementation. Consideration to number of customers served is of paramount importance.

Levels of service as per section 2.2 and the WRMP

Security of Supply Measures – SEMD and risk assessments underway to highlight single points of failure.

Management of a drought – process updated to reflect changes in management structure at VWPL. The process has been rolled out to operational staff for their feedback in terms of content.

Drought triggers and scenarios - The frequency of shortage of water at the borehole has been determined by referencing historic rainfall (in particular deficit of rainfall over consecutive years). An activity will be performed with the EA to investigate whether additional borehole data and historic rainfall data is available to expand on the relationship between borehole levels and rainfall data.

Ground water triggers – ground water levels are being monitored regularly, particularly during the recent high demand period and no observed drop off in borehole levels have been observed.

Demand management actions – These have been included in tables covering 4 bands, higher than normal demand, two consecutive years of high demand, response in terms of temporary bans and finally a full scale drought situation.

Special representations by customers – the process by which a customer can ask to be exempt from the temporary ban. The MoD will be approached first to agree to reduce their take before the situation impacts domestic customers in the area of supply.

Likely demand savings due to hose pipe ban and reduction in MoD usage.

Supply side actions – delivery of water using tankers to service reservoirs and the temporary bypass of filtered (GAC) treatment at boreholes 2 and 3 (but only after a significant risk assessment to balance maintaining supply of water against water quality).

Bulk supplies to Wessex will only be reduced if other alternatives have been considered.

Environmental impact to Pilhill, Nine Miles and Bourne River have been considered and communicated in the plan together with biodiversity. Refer to sections 1.1, 1.4 and 1.5 of this report. These form the basis of Water Industry National Environment Programme (WINEP) activities with the EA.

Communications Strategy – A basic strategy exists and would follow the normal response to a major incident.

Monitoring of demand – improved reporting techniques are being developed that use the data that provides annual reporting of compliance to also report on process, asset and energy key performance indicators.

Post drought actions – These follow the normal post incident process.

Security Emergency Measures Directive (SEMD) – work is ongoing to implement satisfactory security measures and to determine the level of investment. Solutions that are implemented need to closely align with the MoD security infrastructure and processes.

This section can be expanded as the SEMD plan is put into effect.

2.5 CLIMATE CHANGE

Studies predict that demand across VWP region in 25 years will be higher than it is today. We expect a minimum of 1,208 new houses will be built in the next 5 years. We expect overall demand to increase by 20% from the current 4.32 Ml/d to 5.66 Ml/d in the future.

Demand is likely to increase as a direct result of climate change. UKCP09 predictions for VWP region predict a net increase in temperature across the year. As historical data shows, temperature increases have a direct relation to demand due to changes in water usage.

Climate change, potentially leading to longer and hotter summer periods, will also drive more frequent and higher peak seasonal demands. This is confirmed by the key findings of UKCP09 projections, which have indicated that warming will be likely and more intensified in the summer months. Increases in temperature are directly linked with increases in demand with all water companies experiencing higher demand peaks in the summer months. Although the MoD usage does not show an overall peak in summer demand, the additional civilian customers from new developments and the effects of climate change means VWP will have to plan for higher summer peaks going forward.

Approximately 100 years of rainfall data has been used to determine the likelihood of low water table due to consecutive years of rainfall deficit. Strangely there is evidence to support the view that occurrence of consecutive

dry years has decreased in the vicinity of Tidworth which would seem to be against climate change.

A worst case assessment has been made that averages the number of such events over the last 100 years, even though the last occurrence was more than 40 years ago. Further work will proceed referencing additional borehole data and rainfall data to assist in improving prediction of future exceptional weather events due to climate change.

From the UKWIR report on 'impact of climate change on demand' it is predicted that domestic demand will increase by 0.6% up until 2045. As domestic demand makes up the minority of demand within the Tidworth supply area then this will not have a significant impact on the long term demand forecast.

The current conclusion is that given that MoD usage dies not show an overall peak in summer demand, climate change is unlikely to have a significant impact on future peak demand within the Tidworth area, however occurrence of extreme weather events will become more common (and this has been incorporated in the assessment of likelihood of drought conditions).

The energy required to produce and distribute water through the Tidworth network is approximately 170,000 kWh per year. Using a conversion of 0.527 kg CO2 / KWh the total CO2 emissions appear to be approximately 90,000 kg of CO2.

Energy use going forward will be monitored and will form part of future WRMP commentaries.

3 EXCELLENT PERFORMANCE

A process exists and is documented on VWPL Business and Local Management Systems that assist in the delivery of regulatory compliance:

PREVENTIVE December	REACTIVE October	MONITORING June
Water Resources Management Plan Supply over next 20 years Demand for next 20 years Supply / Demand Balance Works required to maintain the balance	**Drought Management Plan** Management Triggers and Scenarios Drought Action Plan Environmental Impacts Post Drought Actions	**Small business Return / July Return** Risk and Compliance statement Key Performance Indicators Customer experience Reliability and availability of supply Environmental impacts Finance **Supply / Demand Table** Production Import / exports Billing and leakage

INTERNAL REVIEW		
Annual commentary and review Forecast of growth v production Update on capital works required Resubmit to regulators every 5 years	Annual review of the plan Resubmit to regulators every 5 years	Submitted annually to the regulators
EXTERNAL REGULATORS AND REVIEW		
Department Environment Food Rural Affairs Drinking Water Inspectorate Water UK (working to deliver solutions) Market Operation Services Ltd (non-household) Environment Agency	Environment Agency Natural England	Environment Agency Natural England OFWAT (economic regulator)

3.1 REGULATORY COMPLIANCE

Waste Water Discharge Compliance

VWPL holds a Permit to Discharge treated foul sewerage effluent from its main Humber lane STW site.

VWPL having previously reached an agreement with the EA on the appropriate Consent for the Tidworth Sewage Treatment Works, are working to deliver a treatment regime that will achieve the new Consent that came into effect during December 2017.

On the 18th May 2017 there was significant rainfall following a long period of dry weather. Samples were taken from the STW's to ensure performance was not adversely impacted. A high ammonia reading was observed and reported to the Environment Agency. The response was that the event was a non-compliance which had no potential environmental effect.

From 26th January 2018 to 3rd March 2018 the Tidworth area experienced considerable snow and low temperatures. This adversely impacted the running of the STW's with the result that a failure in terms of Total Nitrogen (TN) was detected. The works rapidly returned to normal operation following an improvement in the weather. In line with normal procedure an adverse weather waiver application has been placed with the Environment Agency, with photographic evidence of the deep snow and comparison of temperature to TN (the outcome of this application is pending).

VWPL continue to monitor performance in terms of discharge to the environment and report this annually as part of the Small Business Return.

Clean water abstraction compliance

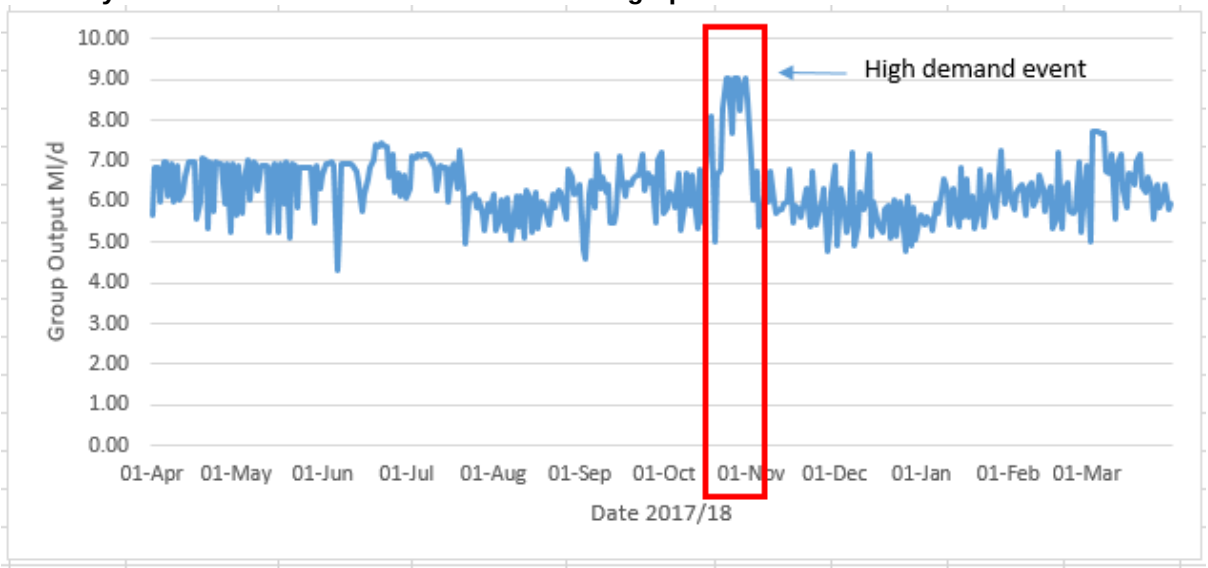
Water to the Tidworth network is supplied by three sources, Tidworth borehole 2, borehole 3 and Chalkpit. They have individual average and peak day licences plus a group licence.

Abstraction for 2017/18

Date	Tidworth No 2 Daily Flow	Chalkpit Daily Flow	Tidworth No 3 Daily Flow	Tidworth Group Daily Flow
Output				
Average	2.20	1.85	2.26	6.30
Peak Day	2.55	3.02	4.50	9.04
Licence				
Average	3.68	3.64	3.68	9.02
Peak Day	4.32	4.69	4.32	12

The supply output by each of the sources was significant below the group licence of 12 Ml/d. The peak day demand reached 9.04 Ml/d (still short of 12 Ml/d) due to a high demand event that is detailed in section 2.2.

The daily demand for 2017 / 18 is indicated in the graph below:



The high demand event is indicated and is described in section 2.2. The observation during this event was that there was sufficient supply to meet even this exceptional demand, which assists in building confidence in the resilience of the network.

3.2 SLUDGE

This aspect of the Treatment Works activity is sub-contracted to Wessex Water on a commercial basis.

The VWPL duty of care in this regard identifies that Wessex Water transports the Tidworth WWTW sludge effluent to their Treatment facilities at either Ratfyn or Amesbury in Wiltshire. The daily travelling distance for either location is < 20 Km.

3.3 INNOVATION

VWPL have developed a process that covers all regulatory reporting, including a regulatory reporting time-table on the Veolia local management system.

This also includes a gap analysis for each of the regulatory reports with actions identified and prioritised.

These actions are now filtering down to local reports and activities that have been mapped against process, asset, compliance and energy. The subsequent reports and activities to enhance performance will thus be aligned with the higher level strategy documents such as the WRMP and DMP.

Appendix 1 of the Water Industry Strategic Environmental Requirements (WISER) report will be used to confirm that there are no further gaps evident in the regulatory reporting process.

The WRMP, DMP and elements of the tables identifying actions have been uploaded to a common page on the internet for ease of reference by customers and stakeholders: https://www.veolia.co.uk/solutions/tidworth-residential-water/tidworth-operations

VWPL will continue to develop their systems and processes. Such activities need to be prioritised due to the size of the organisation and the fact that the company falls outside of the normal price review process.

However, the relative small size of the organisation does present potential benefits when it comes to implementing company-wide improvements to the process.

VWPL have access to wider Veolia communities allowing innovative solutions to be considered to resolve the gaps identified.