



2021 Drought Plan - Draft

Veolia Water Projects Limited (VWPL)

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1. NON-TECHNICAL SUMMARY

Under its Inset appointment, Veolia Water Projects Limited (VWPL) is responsible for the water supply of Tidworth, Perham Down and the east part of Ludgershall.

The water is abstracted from two groundwater sources at three sites (Tidworth BH2, Tidworth BH3 and Chalkpit) under an abstraction licence issued by the Environment Agency. The treated water is then treated and distributed through the water distribution network to around 2,000 civilian properties, over 120 commercial properties, a large garrison and some 1,300 Service Families Accommodation [SFAs] properties in the town and community.

These sources provide sufficient water to meet the needs of VWPL customers as well as providing bulk supplies to a Wessex Water (WW) for the Leckford Bridge Zone to the north of Tidworth, as well as the three Enclaves in Tidworth town.

While historical events show that there is a low probability of adverse impact of a drought on levels of service to customers, and analysis indicates that VWPL is resilient against four consecutive dry years - such an event having not been observed in the last 100 years of historical rainfall data - VWPL Drought Management Plan (DMP) has been developed to demonstrate how VWPL plans to provide a secure supply of water and protect the environment during dry weather and droughts.

VWPL monitors indicators such as rainfall, groundwater levels, reservoir storage, and customer demand within the water resource zone, in order to detect the onset of a drought, assess its severity, and implement appropriate actions through its duration. From these indicators, drought triggers have been defined to identify when the different levels of a drought are reached and what actions need to be taken accordingly. Drought actions will be implemented to reduce water demand (demand side actions) and to maintain the water supply (supply side actions).

Demand side actions include voluntary water saving initiatives, implementation of Temporary Use Bans (TUBs), reduction of the Leckford Bridge export, and ultimately Non-essential Use Bans which will be subject to an Emergency Drought Order.

Supply side actions will focus on maximising the abstraction primarily from Tidworth BH2 and BH3, secondarily from Chalkpit and eventually by-passing partially the GAC (Granular Activated Carbon) filtration process to compensate for the loss of Chalkpit should the groundwater level drop below the bottom of the well.

Note: the supply side actions would not require drought permits as the abstraction sites will continue to be operated within the permitted abstraction limits. Also the environmental impacts of those actions should be limited to those already identified within the abstraction licence. Historical study has confirmed that the overall impact of Tidworth abstraction sites on the Nine Mile River and the River Bourne was small.

Throughout a drought, VWPL will communicate with its customers, the regulators and other key stakeholders in order to raise awareness of the drought situation, promote good practice of water conservation and efficiency, and enforce water usage restrictions (when applicable).

VWPL will manage droughts through its Drought Management Group (DMG) who will ensure that drought actions, communication and reporting are delivered in a timely manner, and who will monitor their effectiveness.

Finally, upon closure of the drought event, VWPL will carry out a “lessons learned” exercise that will enable future processes to be improved.

2. INTRODUCTION

2.1. DROUGHT PLAN REQUIREMENT

Drought Management Plans (DMP) are a statutory requirement for all water companies as prescribed under Section 39B of the Water Industry Act 1991 (WIA) and as introduced by the Water Act 2003.

The purpose of the Drought Management Plan is to demonstrate how Water Companies - here Veolia Water Projects Limited (VWPL) - plan to provide a secure supply of water and protect the environment during dry weather and droughts. It sets out the actions Water Companies will take before, during and after a drought, as well as how the effects of those actions, including the environmental impacts, will be assessed, monitored and prevented or mitigated.

Drought Management Plans are developed in line with the “Water company drought plan guideline”, issued in December 2020 (version 1.2) by the Environment Agency (EA). They are first issued as draft to public consultation after receiving authorisation from the Secretary of State (SoS). Then the revised (final) versions are published once approved by the Secretary of State, and provide a decision aid tool for use by Water Companies during drought events.

Drought Management Plans are to be reviewed at least every 5 years.

2.2. VWPL DROUGHT MANAGEMENT PLAN

Veolia Water Projects Limited’s (VWPL) Drought Management Plan has been developed following the structure proposed in the Environment Agency guidelines, and in consultation with key stakeholders such as the Environment Agency (EA) and Natural England - who hold expertise in areas associated with water resources and the environment, Wessex Water - the neighbouring water undertaker to whom VWPL provide a bulk water supply, the Ministry of Defence (MoD) and CCW, the independent voice for water consumers in England and Wales.

It also takes into account drought management requirements which should be defined in the West Country Water Resources Plan and may affect the VWPL supply area - mainly with regards to the joint approach and communications on customer restrictions.

The document outlines six main sections:

- (i) an introduction to VWPL’s supply area, water resources and its vulnerability to droughts
- (ii) a description of the drought triggers
- (iii) a description of drought management actions
- (iv) an outline of the Environmental Monitoring Plan (EMP)
- (v) a description of the Communications Plan, and
- (vi) an outline of post-drought actions.

VWPL’s Drought Management Plan is closely linked to VWPL’s Water Resources Management Plan as a component of a larger planning framework regarding how to manage, protect and sustain the water resources within the supply area, now and in the future.

3. VWPL SUPPLY AREA

3.1. BACKGROUND

Veolia Water Projects Limited (VWPL) has operated the water supply and sewerage function of a small water resource zone in Tidworth on the edge of Salisbury Plain in Southern England, since 2009 under an Inset Appointment which was transferred from Thames Water Utilities Limited (TWUL) to VWPL.

Under this appointment, VWPL is responsible for management of the water resources throughout the 25 year planning period and for guaranteeing the provision of water services (clean and waste) to over 2,000 civilian properties and over 120 commercial properties in Tidworth, Perham Down and the east part of Ludgershall. The number of properties supplied will increase by approximately 400 by 2024 due to new developments within the supply area.

Also through a PFI agreement between VWPL and the Ministry of Defence (MoD), VWPL services a large garrison that can house up to 6,000 personnel on the site at any one time together with some 1,300 Service Families Accommodation [SFAs] properties in the town and community.

All of the supply comes from groundwater, drawn from a supply of robust, unconfined, chalk aquifer boreholes. These water sources provide sufficient water to meet all the needs of the customers as well as providing the adjacent water supplier, Wessex Water (WW), with a number of bulk supplies.

3.2. SUPPLY SYSTEM

3.2.1. Water Resources

100% of the raw water supply derives from two groundwater sources from an unconfined chalk aquifer via boreholes (BH2 and BH3) and a well (Chalkpit). The boreholes and the well have a long history of good bacteriological quality and have proved robust and reliable within Thames Water Utilities Limited's and VWPL's operating history.

These sources provide sufficient water to meet the needs of VWPL customers as well as providing bulk supplies to Wessex Water (WW) for the Leckford Bridge Zone to the north of Tidworth, as well as the three Enclaves in Tidworth town.

The table below presents the average and peak production for the Tidworth (BH2 and BH3) and Chalkpit (CKP) abstraction sites compared with the permitted abstraction limits.

Figure 1 – Network layout, current production (2019 – 20) and available licence

(MI/d)		Tidworth BH2 Daily flow	Tidworth BH3 Daily flow	Chalkpit CKP Daily flow	Tidworth Group Daily flow
Output	Average	2.23	1.98	2.31	6.52
	Peak day	2.78	3.42	2.79	8.99
Licence	Average	3.68	3.68	3.64	9.02
	Peak day	4.32	4.32	4.69	12.00

Note: while the abstraction licence allows for a peak flow of 4.69 MI/d at Chalkpit, it is worth noting that the licence also requires abstracting routinely and preferentially from the Tidworth boreholes before using Chalkpit.

3.2.2. Water Resource Zone (WRZ)

A resource zone is the largest possible zone in which all resources, including external transfers, can be shared and hence the zone in which all customers experience the same risk of supply failure from a resource shortfall.

The supply for the Tidworth network (including Perham Down) is highly integrated and the risk of supply failure is shared throughout the area so the Tidworth network is classed as a single WRZ.

3.2.3. Distribution System

The distribution network is fed from one strategic reservoir and another secondary reservoir. The network is small and therefore also highly flexible allowing for outages from either source to be met by the other source supplying the whole distribution network. During peak demand periods this would not be viable for multi-day outages depending on which source was not operating.

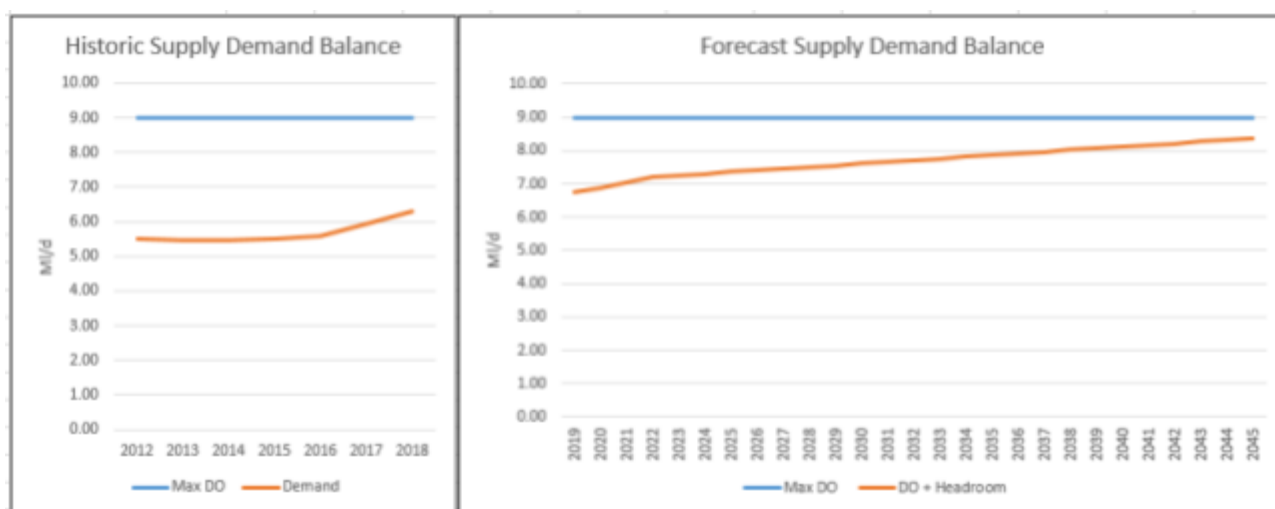
Because of the need to meet Crown firefighting standards at MoD sites the network has been designed to meet a very high instantaneous demand, ensuring network capacity is not an issue.

3.2.4. Water Supply/Demand Balance

VWP has maintained a healthy supply/demand balance which is reflected in the graph below (figure 2).

The demand prediction is shown in orange compared to the Deployable Output (DO) in blue. Our assumption shows a rapid increase in demand until 2022 when all the major housing developments within Tidworth will have been completed. There is then a gradual increase in demand from 2022 to 2045 (assuming slow and gradual infill developments). The predicted demand growth will be reassessed for WRMP 2024 after the major developments have been completed. This will then provide improved confidence in the demand growth from 2024 onward.

Figure 2 – Annual peak supply – demand balance



3.2.5. Bulk Supply

3.2.5.1. **Leckford Bridge Bulk Supply Agreement**

VWPL has a bulk supply in the form of inter-company transfer to Wessex Water (WW). This is known as the 'Leckford Bridge Bulk Supply Agreement' (LBBSA).

Under this agreement, VWPL will endeavour to provide up to a maximum of 3 MI/d, with a maximum instantaneous flow of 36 l/s. Currently, Wessex Water does not take its full allowance.

Also, VWPL will have the right to instruct Wessex Water to reduce the 3MI/d on a 'litre by litre' basis, should:

- the demand within the VWPL area of supply exceeds 5.4 MI/d (critical figure) - excluding the LBBSA volume.
- the maximum quantity of water permitted to be abstracted under the Licence be reduced

Note: the LBBSA may be subject to change as it is currently being renewed.

3.2.5.2. Wessex enclaves

There are three Wessex Water 'enclaves' which are treated by VWPL as part of the main customer network as they are entrenched within VWPL boundary. However, as the users are not VWPL bill paying customers WW would be relied upon to legally enforce drought bans in conjunction with this plan to help constrain demand. Further details of this are contained in the communications section.

3.3. VULNERABILITY TO DROUGHT

3.3.1. Historical data

Neither VWPL nor its predecessors have had occasion to resort to formal restrictions in over 15 years, including through recent drought conditions in 2006/07, 2011/12 and more recently 2018 when many water companies' sources in Southern England were under extreme pressure.

Note: enquiries to MoD personnel who were in post pre-1998 indicate that there have probably been no garrison-wide restrictions in the 20 years prior to that date.

Historical events show that there is a low probability of adverse impact of a drought on levels of service to customers.

Figure 3 – Historical Level of Service - all customer groups

Level	Situation	Impact to Customers	Probability	Historical Events
1	High demand	No restrictions	1 in 5 years (20%)	1
2	2 years of high demand	Proactive approach to water efficiency	1 in 10 years (10%)	0
3	Temporary ban	Temporary use bans	1 in 50 years (2%)	0
4	Emergency Drought Order	Non-essential use bans	1 in 200 years (0.5%)	0

3.3.2. Assessment

Analysis indicates that VWPL is resilient against four consecutive dry years and such an event has not been observed in the last 100 years of historical rainfall data and is not predicted in climate change modelling up to 2091.

Figure 4 – Drought occurrences and Borehole levels

Consecutive dry years	Lowest borehole level observed	Number of events in 100 years
1	92m	5
2	87m	7
3	82m	5
4	77m	0
5	72m	0

Refer to the Appendix 2 of VWPL 2020 Water Resource Management Plan in attachment

This assessment is currently being reviewed as part of Wessex Water Groundwater modeling works carried out under AMP7/WINEP and WRMP24 schemes. VWPL will aim to confirm these assumptions and present the modelling outcomes in more detail in the final version of the Drought Management Plan.

3.3.3. Resilience of supply assets

Audits of the asset management and maintenance processes occur on an annual basis. These audits ensure that the abstraction, treatment, storage and distribution infrastructure remains reliable and resilient.

In addition, a programme of work relating to the Security Emergency Measures Directive (SEMD) is being implemented.

A compliance audit in December 2018 by the Environment Agency raised no concerns and abstraction meters are calibrated on a regular basis to ensure accuracy of reporting.

4. DROUGHT TRIGGERS

4.1. GENERAL

In order to detect the onset of a drought, assess its severity, and implement appropriate actions through its duration, VWPL monitors indicators such as rainfall, groundwater levels, reservoir storage, and customer demand within the water resource zone.

Drought triggers have been defined to identify when the different stages of a drought are reached and what actions need to be taken accordingly (see section 4.3). However, the crossing of a drought trigger does not mean that action must automatically be taken. The drought management team will decide on whether the action is needed based on a range of factors, including the present and forecast conditions and how effective the action would be.

4.2. INDICATORS

4.2.1. Rainfall

Rainfall data is collected and recorded locally at Tidworth Sewage Treatment Works on a daily basis. It is also shared by the Environment Agency on a regular basis.

Under normal conditions, the operations team reviews the rainfall data on a quarterly basis. As a drought develops, this would increase to monthly in order to track the development of the drought and its impacts.

4.2.2. Groundwater level

Groundwater levels are recorded locally at five (5) observation boreholes within the Tidworth catchment on a daily basis via on-site loggers. The data is then collected manually on a monthly basis.

Under normal conditions, the operations team reviews the groundwater level data on a monthly basis. As the drought develops, this will be done weekly or daily depending on severity.

4.2.3. Reservoir level

Levels of the three service reservoirs are monitored in real time through the telemetry system. Minimum and maximum thresholds have been defined and alarms are generated whenever those thresholds are reached.

Under normal conditions, the operations team reviews the pattern of the reservoir levels as part of the weekly and daily site monitoring. As a drought develops, the levels will be monitored continuously.

4.2.4. Customer demand

Customer demand is monitored in real time through the telemetry system via the flow meters at the outlet of the service reservoirs.

Under normal conditions, the operations team reviews the flows pattern on a quarterly basis during winter months and monthly during summer months. As a drought develops, this will increase to weekly then to daily.

4.3. TRIGGERS

The drought triggers are presented in the below table. They have been defined based on:

- Groundwater level: characteristics of the abstraction system (pump level and well depth)
- Reservoir level: operational philosophy and water retention capacity
- Customer demand: peak demand and maximum Deployable Output (DO)

Table 1 – Drought triggers

Level	Trigger
Level 1 - Normal	Groundwater level above 90m AOD* Reservoir level reaching low threshold Customer demand < 8.4 ML/d
Level 2 - Developing Drought	Groundwater level above 90m and below 75m AOD* Reservoir level dropping below the low threshold over less than a week Customer demand at 8.4 ML/d
Level 3 - Drought	Groundwater level below 75m AOD* Reservoir level dropping below the low threshold over less than 36 hours Customer demand at 8.4 ML/d
Level 4 - Severe Drought	Groundwater level below 30m AOD* Reservoir level dropping below the low threshold over less than 24 hours Customer demand at 8.4 ML/d

*AOD: Above Ordnance Datum (with datum as mean sea level)

Note: These triggers may be subject to changes following the modelling work being undertaken to validate the drought vulnerability assessment of VWPL's supply.

4.4. TESTING TRIGGERS

The drought triggers defined above have not been tested fully but we have confidence in these being the correct measurement points following a supply demand event in 2017, where these points were key in alerting us to the issue and in our operational response and recovery activity - the detail of which is included in appendix 1

Note: the additional modelling work to be completed this year will enable us to confirm further that these trigger points are appropriate.

Also VWPL plans to carry out a drought exercise after two consecutive non-drought years, to test the planned triggers and actions.

5. DROUGHT ACTIONS

5.1. GENERAL

During a drought, VWPL will implement actions to reduce water demand (**demand side actions**) and actions to maintain the water supply (**supply side actions**). VWPL will aim to prioritise the demand side actions, such as reducing customer demand, leakage, and outages, and supply side actions with the least damaging impact to the environment before considering applying for drought permits and orders

However, it is worth noting that based on our current vulnerability assessment and the abstraction limits defined in our abstraction licence, VWPL does not envisage needing to apply for a Drought Permit or Order.

Note: the additional modelling work to be completed this year will enable us to confirm further these assumptions.

The table below provides a summary of the drought actions VWPL will implement at different stages of a drought. Specific drought actions will be carried out under the supervision and management of the Drought Management Group (DMG) whose roles and responsibilities are detailed in section 9.

Table 2 – Drought Actions

Level	Demand side actions	Supply side actions
Level 1 - Normal	1. Water saving activities (level 1)	1. Change reservoir operation thresholds to increase abstraction regime from CKP
Level 2 - Developing Drought	1. Water saving activities (level 2) 2. Temporary Use Bans (TUBs) (level 2) <u>Note:</u> VWPL will also consider gathering data for an environmental assessment at this stage	1. Maximise pumping capacity of all abstraction sites within current pumping arrangement/treatment capacity (abstraction within permitted limits)
Level 3 - Drought	1. Level 2 demand side actions 2. Temporary Use Bans (TUBs) (level 3) 3. Proportionate reduction of Leckford Bridge export <u>Note:</u> VWPL will also consider gathering Environmental data at this stage	1. Increase further abstraction capacity of BH2 & BH3 to compensate for the loss of CKP, partially bypassing the Granular Activated Carbon (GAC) <u>Note:</u> Lowering the pumps may also be considered (abstraction within permitted limits)
Level 4 - Severe Drought	1. Level 3 demand side actions 2. Emergency drought order - Non-Essential Use Bans (NEUBs)	1. Increase further abstraction capacity of BH2 & BH3 by replacing and upsizing abstraction pumps 2. Tankering

5.2. DEMAND SIDE ACTIONS

As a drought develops, VWPL will implement demand side actions to reduce water demand across the Tidworth Inset area. VWPL will also liaise closely with relevant stakeholders - such as Wessex Water and the MOD, to ensure a consistent approach across the Water Supply Zone (Tidworth Inset and enclaves) - especially with regards to Temporary Use Bans.

This section presents demand side actions at each level of a drought in more detail.

Note: where use bans are requested, this will refer to the powers VWPL holds as a statutory undertaker. However any actions requested of the MoD would assume co-operation in good faith between client and service provider. VWPL's previous experience indicates that the Garrison Commander will co-operate fully and frequently requests water resources updates to keep abreast of developments.

5.2.1. Water saving activities (level 1)

At level 1, water saving activities represent water operations activities and water efficiency activities that VWPL will initiate and/or implement as part of its normal operation and business activities.

Lead-in times: the outcomes from Level 1 activities are immediate, on-going and advisory in nature. Therefore the actions at this level are designed to set the scene for the need for future restrictions.

Water operations

- Leakage – continue to monitor leakage and ensure it is maintained at a sustainable and cost efficient level.
- Pressure – continue to maintain pressure management as a tool for minimising leakage.
- Water use at operational sites – carry out water audits at operational sites and set targets for water use.
- Bulk supply - monitor the Leckford Bridge export to Wessex Water (*limited only by the maximum flow defined in the Bulk Supply Agreement at this stage*).
- Planned maintenance/outage - ensure that there are no planned capital works occurring during the peak demand period that may impact on deployable output of the sources.

Water efficiency

- Internal water efficient culture – develop water awareness programmes for employees and expect them to become water efficiency ambassadors for VWPL.
- Metering – encourage metering of domestic homes using an opt-in arrangement.

Using the water balance and known consumption values, metered customers in Tidworth use over 5% less water than unmetered customers. This shows water efficiency could slightly improve if more properties are metered. Currently more than 85% of the domestic homes within the zone are metered.

- Customer awareness – inform our client and customers of the challenge on water resources and water savings they can implement to reduce consumption.

5.2.2. Water saving activities (level 2)

At level 2, as a drought develops, VWPL will heighten its water saving activities.

Lead-in times: the level 2 actions set out below will have been rehearsed previously by VWPL and will be rolled out within one week. Communication with the MoD will commence on day 1 of the declaration of the level 2 status and experience shows us that any requirements for water saving will be promulgated across the Garrison within 24 hours and will be effective soon thereafter.

Water operations

- Enhanced Leakage Reduction – unlikely to yield a significant increase in savings, but important to rapidly fix bursts and visible leaks and supply pipes to maintain customer support.
- Demand monitoring - real time monitoring of telemetry data to ensure that demand within the military areas and Wessex enclaves is not excessive.
- Bulk Supply - engage with Wessex Water in line with the communication protocol set out in the LBBSA to discuss the potential need to reduce the maximum transfer on a proportional basis and implement water restrictions in their area. It is anticipated that up to 1 MI/d may be made available to the Tidworth Service Area through this route. However such discussions will need to consider security of supply to Wessex Water customers.
- Planned maintenance/outage - ensure that there are no planned capital works and planned maintenance outages occurring during the peak demand period that may impact on deployable output of the sources.
- An increased level of communication with Wessex Water, Cholderton Water Company [advisory only] and the MoD, the latter through the regular Garrison Commander's meetings, will keep all key parties advised on the water resource situation and the potential requirement for formal restrictions.

Water efficiency

- Public Relations Campaign – customer awareness focusing on drought implications e.g. customer information point[s] at a key location[s] in Tidworth town to reach the maximum number of civilian customers.
- Liaison with the MoD to spread good water efficiency practices as they are the major water user.

5.2.3. Temporary Use Bans (TUBs)

5.2.3.1. General

From the 1st October 2010 Section 36 of the Flood & Water Management Act (FWMA), 2010 allows water companies a wider range of temporary water use restrictions that they can implement during a drought without requiring a drought order. It provides detailed definitions of uses, exemptions and conditions in relation to these new powers.

The Drought Direction 2011 sets out those water uses that will still require an ordinary drought order if they are to be restricted during a drought. These pieces of legislation supplement each other and together they set out the categories of water use that can be restricted by a company and the ones which can only be restricted under a Drought Order.

The changes introduced by the government have made the powers clearer and have enabled more effective and equitable restrictions during times of drought. It is hoped that through introducing

these new powers better conservation of water earlier on in a drought will occur thus ensuring supplies are protected for essential domestic use.

The following table sets out the Temporary Use Bans (TUBs) that VWP will consider enforcing as a drought develops in level 2 towards level 3, and in level 3 towards level 4. These activities will be applicable to civilian customers in the supply area as well as SFA (Service Family Accommodation) outside of the military sites.

Table 3 – Temporary Use Bans

Level	Civilian (including SFAs and WW ‘enclaves’)	MoD (all ‘behind the wire’ activity)
Level 2 - Developing Drought	<ul style="list-style-type: none"> • Watering a garden using a hosepipe • Cleaning a private motor vehicle using a hosepipe • Watering plants on domestic or other non-commercial premises using a hosepipe • Cleaning a private leisure boat using a hosepipe • Filling or maintaining a domestic swimming or paddling pool • Drawing water, using a hosepipe, for domestic recreational use • Filling or maintaining a domestic pond using a hosepipe; and • Filling or maintaining an ornamental fountain • Cleaning walls, or windows, of domestic premises using a hosepipe • Cleaning paths or patios using a hosepipe • Cleaning other artificial outdoor surfaces using a hosepipe 	<ul style="list-style-type: none"> • Sensible use in mess catering activities • Vehicle washer restraint on non-essential use • Increased maintenance by Aspire (contractor for MoD) of all MoD assets that could be ‘wasting water’ e.g. sand/oil filters, taps in Junior Ranks Single Living Accommodations (JRSLAs) and canteens • Watering plants and lawn areas • Unnecessary workshop use • Suspension of wet hydrant testing relating to flow rate.
Level 3 - Drought	<ul style="list-style-type: none"> • Cleaning non-domestic premises • Cleaning a window of a non-domestic building • Operating a mechanical vehicle-washer • Cleaning any vehicle, boat, aircraft or railway rolling stock • Cleaning industrial plant • Suppressing dust • Operating cisterns 	<ul style="list-style-type: none"> • Watering sports pitches, e.g. Oval, cricket pitches and polo fields • No vehicle washing

5.2.3.2. Representations and actions prior to implementation of restrictions

Before any restriction is implemented under these new provisions, VWP will provide the opportunity for representations to be made

Publicity Requirements

Section 76B of the WIA 1991 has enhanced previous publicity requirements with regard to imposing restrictions. Before any prohibitions can be applied, VWP must:

- Publish a notice on the website at the same time as publishing a notice in two local newspapers.
- Provide details in the notice of how to make representations about proposed prohibition.
- Give notice each time the scope of any prohibition imposed under section 76 of the WIA 1991 is altered in any way; and
- Give notice in relation to the lifting of any prohibitions on the website and in two local newspapers (see section 6 for future details).

While there will be a lead in time for the implementation of restrictions to allow for representations, there is no such lead in time necessary for the revocation of restrictions; the lifting of a ban will take effect as soon as notice is given by one of the required means.

Timescales

Temporary Ban Notices - two weeks will be allowed for representations before implementation.

Subsequent Notices or Changes - one week will be allowed for representations before changes.

Making Representations

Before a restriction is implemented under these new provisions, VWPL will provide the opportunity for representations to be made; the time allowed for representations will depend on the scale of the proposed restrictions. The proposed timescales are outlined above. Customers seeking to make a representation will be able to do so by a variety of means. The following forms of media will be available for customers to make such representations:

- Website:
 - An online form will be available for customers to complete and send back to VWPL customer services by email. The customer will also be able to print the form, fill it in manually and return it by post to the nominated VWPL office.

The form will be developed in the early phases of our drought response.
- Telephone:
 - A customer service advisor will be able to post a copy of the form to a customer address.
 - A customer service advisor will be able to complete an e-copy of the form by taking customer details on the phone – it is anticipated that this will be the most common route for representations.

Although on-going communication with Wessex Water will have occurred as the prospect of restrictions approaches [see above], discussions allowing Wessex Water to make a formal representation will be held around the need for Wessex Water to impose such restrictions as

VWPL deem appropriate for its own customers on to their Wessex Water “Enclave Customers” in the Tidworth Service Area.

Handling Representations

Representations received will be collected and reviewed on a weekly basis. A panel of members from the Drought Management Group will convene to discuss the outcome of representations, with a final decision made by all representatives on the eligibility of the representation within five working days of the form being sent in by the customer. There will be no appeal process if the application for a concession or exemption is denied.

Concessions and Exemptions

The DMP only includes formal statutory exemptions outlined in the model code of practice. In order to conserve water and ensure a safe and secure supply during a drought, no other concessions will be granted by VWPL (excluding MoD as a customer). A summary of these exemptions is listed below.

The FWMA, 2010 lists statutory exemptions which can be regarded as concessions.

1) On the grounds of health and safety:

- to clean the surfaces of a private leisure boat to prevent it from transferring invasive species to new waters.
- to clean the walls or windows of domestic premises.
- to clean paths or patios or other artificial outdoor surfaces
- to fill or maintain a domestic pond or ornamental fountain in which fish or other aquatic animals are being reared or kept in captivity.

2) To fill or maintain a domestic swimming or paddling pool:

- where necessary in the course of its construction.
- that is designed, constructed or adapted for use in the course of a programme of medical treatment.
- used for the purpose of decontaminating animals from infections or disease.
- used in the course of a programme of veterinary treatment.
- in which fish or other aquatic animals are being reared or kept in captivity.

Application for Concessions

VWPL will consider applications based on the grounds of health and safety and biosecurity. Customers must apply by contacting VWPL by one of the means outlined above. Details of how VWPL will handle representations received have been outlined in section above.

VWPL will not consider any applications for compensation in the event that temporary bans on water usage are introduced. The company has to plan on the basis that it may have to impose restrictions during long periods of very dry weather or drought. This means that the bills customers pay already reflect the potential for restrictions. Further clarification on this matter can be found on the Ofwat website.

MoD restrictions – Secure Areas and Service Families Accommodation [SFAs]

Also summarised in table 3 are the restrictions the MoD will be requested to put in place when specific drought triggers are reached. These range from advising the mess catering facilities who are large users to cut back on unnecessary water use and wastage, escalating to the cessation of

vehicle washers and not watering sports pitches. Such prohibition may have a significant effect on the military operational work up to deployment training and will be discussed with the Garrison Commander in advance, normally through the quarterly meetings, the frequency of which may move to monthly, fortnightly or even weekly if the situation demands. Given the close liaison that VWPL maintains with the military, both with the Garrison and SFA Estates, it is expected that responses to demand controls will be immediate and proportionate to the level of stress.

Table 3 Column 2, Civilians and SFAs - sets out the measures that would apply to Regulated domestic household customers and, where applicable, SFA occupants. The MoD through the Defence Infrastructure Organisation [DIO], would be required to promulgate the same advice to the SFA occupants and ultimately the same restrictions through Levels 2 & 3. SFA occupants may also be subject to early restrictions to save water - instructed by DIO working in cooperation with VWPL. From the early stages of a drought, the DIO Housing Office Staff would be requested to oversee their particular estate's water demand and through communication and engagement to encourage water use reduction.

5.2.3.3. Demand Savings

The demand savings associated with imposing Temporary Use Bans can be difficult to quantify – there is little or no evidence of the savings associated with the majority of individual water use covered by the FWMA, 2010. Using the UKWIR (2011) code of practice (CoP) we can estimate that the savings (particularly associated with restricting the use of hosepipes for garden watering) in our region would amount to ~2.5% of the water we put into distribution. This would equate to 0.16 MI/d at peak DI or 0.146 MI/d on average. This is lower than the savings suggested by the UKWIR guidance to reflect the higher proportion of metered customers in our region (83%) compared to the UK average. This data is based on tariff trials carried out by Wessex Water.

Savings from the MoD's activities could be significant when taken as a whole and could be worth up to 0.2 MI/d depending upon the prevailing military need at the time. The savings anticipated from the SFA estates will be lower than industry standards for regulated domestic customers due to their reduced leisure water use behaviours e.g. very little hose pipe use and no appreciable garden watering. A modest saving of 0.1 MI/d could be anticipated from this sector.

Total demand savings due to the Temporary Use Bans (Level 2 & 3) are estimated to be 0.45 MI/d.

Effectiveness of the restrictions will be monitored when reviewing the water demand profile on a weekly and daily basis.

5.3. SUPPLY SIDE ACTIONS

As a drought develops, VWPL will implement supply side actions to maintain the water supply and meet the water demand across the Tidworth Inset area. It is important to note that these supply side actions would not require drought permits (hence environmental assessment) as the abstraction sites will continue to be operated within the permitted abstraction limits.

Note: VWPL has one abandoned borehole which could have been considered as an option for Level 4 supply side action and would be subject to a drought permit. However given the existing configuration of the network, this borehole would not be able to be operated when BH2 and BH3 are running. Therefore this option has been discarded.

This section presents the supply side actions at each level of a drought in more detail.

5.3.1. Increase of abstraction regime

As a drought develops into Level 2, the operating thresholds of the service reservoirs which control the operation of the pumps and valves at the abstraction sites will be adjusted to a high level

demand profile. This will result in an increase of the operation of the abstraction pumps to their maximum capacity.

Firstly BH2 and BH3 will be increased gradually in order to minimise the operation of CKP. However as the drought develops towards level 2 it is expected that all three abstraction sites will be running at their maximum capacity (but still below the abstraction limits), producing up to a Deployable Output of 8.6 mld.

5.3.2. Maximum abstraction at BH2 & BH3 (only)

As the level 3 trigger approaches the CKP source will start to come under threat of outage due to groundwater levels reaching the Deepest Advisable Pumping Water Level (DAPWL). In order to preserve this source if demand has not been sufficiently restricted, the source's outputs will be reduced. As the abstraction site does not currently have variable speed pumps, this will be done by reducing the hours of usage. Such a measure will aim to reduce the drawdown (cone of depression) of the water table around the source and prevent complete source outage. Should this occur then the BH2 and BH3 abstractions would need to be increased and run at maximum capacity to compensate for the loss of Chalkpit while continuing to meet the demand.

Investigations have revealed that BH2 and BH3 can deliver a greater output by partially bypassing the GAC (Granular Activated Carbon) treatment process and adjusting the variable speed drives (VFD) of the pumps. Water quality at the sources of BH2 and BH3 and post GAC will need to be closely monitored to ensure wholesomeness while the GAC treatment is partially bypassed. However it is expected that the operating process will provide adequate dilution to guarantee water quality compliance.

VWPL envisages that in such a configuration, BH2 and BH3 will still be operating within their current abstraction limits. There will be no need for Drought Permitting.

Note: this activity may be subject to a drought order. If confirmed, VWPL will ensure that the final DMP includes the documentation to meet the "application ready" principle.

Another short term operational solution would be to allow reservoir levels to fall below their lower level indicators (but within a controlled level to guarantee continuous water quality compliance) before borehole pumps begin to 'top-up'. Although this is not a sustainable solution it could help meet daily 'peaks' without increasing water abstraction and therefore drawdown of the water table.

The effectiveness of supply side actions will be monitored as part of continuous site monitoring.

5.4. EXTREME DROUGHT

In case of extreme drought VWPL has considered:

- Demand side actions such as Non-Essential Use Bans in order to reduce water demand even further. These actions will be subject to an emergency drought order.
- Supply side actions such as replacing the abstraction pumps at BH2 and BH3 to increase further the abstraction capacity while continuing operating within the permitted limit or water tankering at last.

The likelihood of such events occurring is not clear from the current vulnerability assessment hence this section has not been expanded and will be amended based on the outcome of the additional modelling work due to be completed in 2021.

5.5. ENVIRONMENTAL ACTIONS

VWPL has not carried out a Strategic Environmental Assessment [SEA] in the preparation of this Plan as no Drought permit or Drought order requirements have been confirmed. However VWPL is

planning to gather data in order to assess the potential environmental impact of its abstraction activity (if any) in case drought permit/order options are required in the future.

6. COMMUNICATIONS

6.1. GENERAL

Throughout a drought, VWPL will communicate with its customers, the regulators and other key stakeholders in order to raise awareness of the drought situation, promote good practice of water conservation and efficiency, and enforce water usage restrictions (when applicable).

The table below presents VWPL's key stakeholders and the different levels of engagement:

Table 4 – Key stakeholders and communications

Stakeholder	Liaison	Means
Household customers	<ul style="list-style-type: none"> - Communicate on importance of and opportunities for water savings & efficiencies - Consult/communicate on water usage restrictions 	Communications in bills, call centre, website update, letter drop, social media, traditional media e.g. local newspapers
Non-household customers	<ul style="list-style-type: none"> - Communicate on importance of and opportunities for water savings & efficiencies - Consult/communicate on water usage restrictions 	Through retailers - email, letter drop, website update
MOD (Garrison Commander)	<ul style="list-style-type: none"> - Communicate on importance of and opportunities for water savings & efficiencies - Provide situation updates - Communicate on water usage restrictions 	Local radio, newspaper, calls and meetings, written communication
Regulators - Environment Agency, Defra, Ofwat	<ul style="list-style-type: none"> - Engage at the different levels of a drought to share information, data - Discuss potential issues and effective mitigations in a collaborative approach 	Regular meeting Written communications (email/letter) Communication via Water UK
Local authorities, CCW, Natural England	<ul style="list-style-type: none"> - Provide situation updates and drought messages to be communicated to a wider audience 	Written communication as required Meetings
Neighbouring companies (Wessex Water, Southern Water, Cholderton Water)	<ul style="list-style-type: none"> - Share data and drought management information - Promote collaborative and consistent approach across the regional area and develop joint communications - Communicate on restrictions/flow reductions 	Regular meetings, workshops Written correspondence
Staff	<ul style="list-style-type: none"> - Provide situation updates and actions in place/required - Brief employees on customer messages 	Internal briefing Team meeting Intranet

The Drought Management Group will be responsible for managing internal and external communications - including frequency, means, and content of messages and will aim to do so following the communication principles defined in the Water UK codes of practice:

- Ensure a consistent and transparent approach
- Ensure that water use restrictions are proportionate
- Communicate clearly with customers and the wider public/users
- Consider representations in a fair way

The effectiveness of communications will be measured in the adoption of timely measures and responses in order to maintain the security of public water supplies and reduce water demand.

7. ENVIRONMENTAL ASSESSMENT

The following section indicates environmental areas which may potentially be impacted when operating the abstraction sites at their maximum capacity to meet the requirements of a drought situation.

Note: As part of the WINEP/AMP 7 scheme, additional modelling work is currently being carried out this year in order to confirm these impacts. If any additional information and environmental requirements are highlighted as part of this exercise, VWPL will aim to share those in the final drought plan.

It is worth noting that all supply side options included in the drought management plan are available within the operational limits of the existing abstraction licence. So environmental impacts should be limited to those already identified within the abstraction licence.

7.1. NINE MILE RIVER & RIVER BOURNE

The former National Rivers Authority (NRA) commissioned a study of the Upper Hampshire Avon catchment, which in 1993 reported indications that abstractions of water were to the detriment of the ecology of both the Bourne and Nine Mile (9MR) Rivers. The perception of a trend towards lower flows, particularly in the upper reaches of the rivers, was exacerbated by low rainfall and recharge experienced in 1992 and 1997. Other drivers such as the UK Biodiversity Action Plan identifying chalk stream habitats as a priority, and low flow complaints, led to a further study and assessment by the EA of the 9MR.

The conclusions from this study (River Bourne & Nine Mile River Conceptual Modelling Report, EA South West Region, 2001) were based on purely a conceptual understanding as no numerical, three-dimensional groundwater modelling was conducted. The effects of the Tidworth abstractions on the 9MR were summarised as very minor in comparison to abstractions in the Avon catchment and its depletion of flows.

“In wet years some groundwater flow may be induced from the Bourne surface water system and minimal through flow. Up-catchment effects will be to take flow from the Whiteway Rock (outcropping at Leckford Bridge), Chalk Rock (outcropping between Collingbourne Kingston and Collingbourne Ducis). The abstraction may extend the period when the river is dry, as well as the length of river that is dry”.

This is compared to the impact of the Tidworth STW discharges back into the aquifer.

“This discharge is via multiple lagoons which act as a soakaway. The water is thus returned directly into the aquifer albeit at a shallower level than the abstraction. 85-100% of Tidworth Abstraction is therefore likely to be discharged back to the surface system which will re-infiltrate into the Seaford Chalk and in wet months may flow south to the Bourne catchment.”

Source: River Bourne & Nine Mile River Conceptual Modelling Report, EA South West Region, 2001.

Further modelling work carried out as part of the Bourne and Nine Mile Rivers RSA Project - Phase 2 Investigations in 2004, confirmed that the overall impact of Tidworth abstractions sites on the Nine Mile River and the River Bourne was small:

“The overall impact of Tidworth abstraction is small, with the total average depletion flows in the model area being approximately 0.0074 m³/s (sum of impacts at Salisbury model outflow and Kimbridge). The average impact on the Bourne, Nine Mile, Avon (upstream of Nadder) and Test at Kimbridge is 0 m³/d, - 0.0003 m³/s, - 0.0024 m³/s, - 0.005 m³/s respectively.”

7.2. PILLHILL BROOK

Pillhill Brook is a 9.9km long tributary of the River Anton situated to the east of Tidworth. EA groundwater modelling indicates the operation of the Tidworth abstraction sites to their maximum permitted limit could have a slight impact on the flow of this river.

VWPL will liaise with the Environment Agency to gather more information on this. Also the current modelling work referred above should enable VWPL to confirm the environmental impact (if any).

7.3. TIDWORTH NETWORK

Biodiversity has been indicated as a concern, particularly during drought conditions, by Natural England and the Environment Agency.

As part of good operating practice a system has been put in place by VWPL to constantly review health and safety aspects during site visits. This will be extended to include environmental aspects. Environmental awareness training has already been delivered to the operational staff accordingly.

Monitoring of environmental impact will continue during a drought condition and will be escalated to the Drought Management Group whenever appropriate.

8. END OF DROUGHT

8.1. IDENTIFYING THE END OF A DROUGHT

The end of a drought can be defined as when the risk to the security of supply and to the environment from drought are no greater than they would be during a normal year, and where normal conditions have resumed for a specified period of time. The hydrological conditions as a drought recedes can be complex and identifying the end of a drought can be difficult to determine.

VWPL will confirm first and foremost with the EA that the water resource situation has returned to normal before taking any action. Then, the end of a drought will be determined using the company's triggers. The following stakeholders would also be notified before any actions are taken: DEFRA, Ofwat, Water UK, CCW, DWI, Environmental Groups, Wessex Water and Cholderton Water, VWPL Board and Employees.

All restrictions can be removed when drought triggers have moved out of level 2. The lifting of the ban will first require notice in relation to the lifting of prohibitions to be published on the company website and in two local newspapers. Unlike the imposition of restrictions however, there is no such lead in time necessary; restrictions will be revoked instantly after the notice is given.

8.2. POST DROUGHT ACTIONS

Directly after a drought event, it will be the responsibility of the Senior Operations Manager to produce a "lessons learned" report that will enable future processes to be improved. This report will be produced within 3-6 months of a drought ending and will be followed up within a year with evidence that recommendations were acted upon. The report will include:

- A review of the environmental impact of the drought by analysing baseline, in-drought and post-drought data.
- Determining if the appropriate environmental monitoring of baseline, during and after a drought was carried out to measure the impact of any drought orders, as well as any additional, ongoing monitoring requirements in order to understand how the environment is recovering
- A review of the timeline and the effectiveness of the drought triggers and the drought actions implemented.
- An assessment of how well individual sources delivered additional water and determine where any re-assessments of yields may be needed or invested to maintain yields of sources.
- An assessment of the estimates of demand reduction from the implementation of demand side drought management actions.
- An investigation into whether or not the company would need to make any changes to its demand forecast or longer term demand forecast

Additionally a drought workshop would be held to assess the efficacy of the management process and review whether any improvements or changes to the drought plan were required (involving ideally the entire Drought Management Group).

The Drought Management Plan and the Water Resource Management Plan will be updated based on the recommendations and improvement actions agreed through the review process.

9. DROUGHT MANAGEMENT STRUCTURE

9.1. STRUCTURE

VWPL will manage droughts through the Drought Management Group (DMG) which includes:

- General Manager
- Contract Manager
- Senior Operations Manager
- Water Operations Manager
- Water Quality Manager
- Customer Services Manager
- Regulatory Specialist

As the drought develops, the level of personnel involved, the frequency of meeting/communication, and the decision makers will evolve. This is presented in the following table

In the case of a severe drought, the incident will be escalated to the Veolia Corporate Crisis Management Team who will provide additional support and oversight of the event to ensure optimum decision-making efficiency in the shortest possible time.

Table 5 – Drought Management through the Drought

Level	Drought Management Group	Communication/ Reporting	Decision maker
Level 1 - Normal	Initial DMG	Weekly update Monthly meeting	General Manager
Level 2 - Developing Drought	Initial DMG Asset Manager	Daily update Weekly meeting	General Manager in consultation with Regional Director
Level 3 - Drought	Initial DMG Asset Manager Regional Director	Daily update Daily meeting	Regional Director in consultation with VWPL board
Level 4 - Severe Drought	Initial DMG Asset Manager Regional Director CEO	12 hours update Daily meeting	VWPL board in consultation with Crisis Management team

9.2. ROLES & RESPONSIBILITIES

Drought management will be overseen by relevant sectors of the business as detailed below.

The General and Contract Managers will lead on technical functions and the drought communications strategy.

1. Water Operations - responsible for:

- Monitoring and reporting on the state of available water resources, the operational status of water supply assets, and the prediction of likely impacts.
- Ensuring that the company's water abstraction and production is at full capacity during months of low rainfall and high demand.
- Implementing approved supply side actions at the relevant stage

2. Network Operatives - responsible for:

- Monitoring and reporting on leakage, water demand and Leckford Bridge export, the prediction of likely impacts.
- Ensuring that the network is operating at its most efficient when demand is highest.
- Implementing or facilitating the implementation of the demand side actions related to water savings activities - water operation (level 1 & level 2)

3. Customer Services - responsible for:

- Sharing relevant customer information (e.g. vulnerable, retail customers)
- Producing and circulating the necessary communication materials through the agreed communications channels.
- Responding to customers' queries regarding the drought and restrictions, and reporting on it to the DMG.

4. Stakeholder Management - responsible for:

- Liaising and communicating with key stakeholders at the relevant stage (EA, DWI, MOD, Wessex Water, Cholderton Water, local authorities/organisations etc.)
- Reporting to the VWPL Board

Responsibilities for specific actions are detailed in the below table

Table 5 Key Actions for Drought Management Plan responsibility table

Action	Delegation	Timescale
Drought monitoring, reporting/recording	Senior Operations Manager	Monthly/Weekly Enhanced during drought
Review Drought Management Plan	Contract Manager	Annually
Drought Triggers Breached	General Manager	Upon Level 1 breach
Convene Drought Management Group and internal communication	Contract Manager/ General Manager	Monthly/Weekly/Daily Enhanced during drought
Communication to VWPL Board	Regional Director - IWE South	Upon Level 2 breach
EA Liaison	Contract Manager/ General Manager	Under direction of DMG Upon Level 3 breach
MoD Liaison	Contract Manager/ General Manager	Upon Level 2 breach
OFWAT Liaison	Contract Manager/ General Manager	Under direction of DMG

DWI Liaison	General Manager	Under direction of DMG
Neighbouring Water Companies (Wessex Water/Cholderton Water)	Contract Manager/ General Manager	Upon Level 2 breach
Capex Programme identified	Asset Manager	Under direction of DMG
Opex monitoring system	Senior Operation Manager	Cost Centre set up
Capex Delivery	Project Management team	Under direction of DMG
Water quality monitoring & compliance	Water Quality Manager	on-going
Drought Order or Restriction removal	Regional Director - IWE South	Once drought triggers are back to Level 1
Promoting efficient use of water	Contract Manager/ General Manager	Upon Level 1 breach
Appeals for reduction of water usage	Contract Manager/ General Manager	Upon Level 2 breach
Stand down of DMG	Regional Director - IWE South	Return to 'normal' hydrological conditions
Emergency Planning	Regional Director - IWE South	Under direction of DMG and VWP Board

10. APPENDICES

APPENDIX 1 - 2017 HISTORICAL DROUGHT

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. However, the customer demand was continuously met during the event and VWPL did not have to implement the drought management plan. Nevertheless, lessons were learned from this event which have been incorporated into this drought plan.

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

- Work was being carried out at Chalkpit WTW to improve the treatment facilities which impacted on the reliability of the output of the plant. That was resolved once the permanent upgraded treatment process was fully operational. 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. Closer communications with Wessex Water have been organised to allow better management of the transfer of flow.
- A 6 inch wheel valve was subsequently discovered to be fully open on the network allowing in excess of 1 MI/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 at water treatment facilities, increased Leckford Bridge export and significant non-legitimate demand occurring within the military facility.

Enquiries to MoD personnel who were in post pre-1998 indicate that there have probably been no Garrison-wide restrictions in the 20 years prior to that date.

Analysis indicates that VWP is resilient against four consecutive dry years and such an event has not been observed in the last 100 years of rainfall historical data and is not predicted in climate change modeling up to 2091. This will be reviewed as part of WRMP 2024.