DRAFT FINAL DROUGHT PLAN 2018

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1 EXECUTIVE SUMMARY

1.1 Introduction

Portsmouth Water provides an average of 170 million litres of drinking water per day to around 310,000 domestic and commercial customers in south east Hampshire and part of West Sussex.

Throughout the Company's long history, it has paid particular attention to ensuring that it meets its statutory obligations to maintain supplies, despite many drought periods such as those during the 1890s, 1900s, 1921, 1934, 1973, 1976, 1990s and 2012.

1.1.1 *Statutory Drought Plans*

Section 63 of the Water Act 2003 imposed the requirement for water companies to prepare statutory drought plans as well as the requirement to conduct consultations in their preparation.

Portsmouth Water's previous Drought Plan was published in April 2013. This Draft Drought Plan has been prepared following the introduction of the Flood and Water Management Act 2010 and the Water Use (Temporary Bans) Order 2010. This legislation covers temporary restrictions which can be introduced during a drought and the Drought Plan Direction 2016 covers additional measures that can be introduced in more severe droughts.

1.1.2 *Basis of Portsmouth Water's Drought Plan*

The Company's water sources are all groundwater based, with 60% of water supplied from boreholes and wells, 31% from natural springs at Source B, and 9% from Source A, a river abstraction above the tidal limit of the groundwater-dependent River Itchen.

Portsmouth Water currently has no surface water storage reservoirs and hence its ability to maintain supplies during a drought relies upon balancing demands with the yield from its sources. The greatest challenge is therefore likely to be during dry summers when peak demands are usually experienced.

1.1.3 *Portsmouth Water's Resources and Transfers*

Portsmouth Water has twenty water sources and the yield of many of these sources diminishes as ground water levels and river flows decline.

Portsmouth Water has only one "resource zone" as defined by the Water Resources Management Plan.

Portsmouth Water has a bulk supply agreement with Southern Water to supply up to 15 Ml/d to Southern Water's Sussex North Zone. A new bulk supply has been commissioned to Southern Water's Southampton East Zone and this can supply up to 15 Ml/d with the possibility for future increases. The bulk supply agreements cover drought events but do not guarantee that water will be available to Southern Water in extreme conditions.

1.1.4 *Drought Management Areas*

The whole Company supply area is little more than 50 km x 30 km with well developed 'connectivity' between its sources and service reservoirs. The sources are not isolated and the connecting links enable transfers between areas if required. As a result the Company will treat the whole of its supply area as a single Drought Management Area.

1.1.5 *Habitats Regulations Review of Consents*

This Drought Plan takes account of licence variations that have been made since 2013 as a result of the Habitats Review of Consents and the Water Framework Directive investigations.

1.2 The Impacts of Drought for Portsmouth Water

The Flood and Water Management Act 2010 defines drought as a significant period without rainfall. This Plan is likely to be required only during prolonged periods of low rainfall that impact on groundwater supplies since the Company's Water Resources Management Plan makes provision for balancing supplies with demand under normal weather conditions. A wide range of drought scenarios has been considered so that the Plan can cope with repeats of historical levels of drought and also future 'plausible' droughts that are more severe. These include the 'Reference Level of Service' which the Government have set as a 1 in 200 year return period. Events with return periods longer than this are covered by the Company's Emergency Plan, which due to national security reasons cannot be in the public domain.

1.2.1 *Drought Indicators*

The yield of the Company's groundwater sources is entirely dictated by groundwater levels, which are principally dependent upon aquifer recharge from rainfall during the winter period. The Company therefore monitors both rainfall and groundwater levels to enable it to estimate the expected output from its sources during the months ahead.

The Company has monitored groundwater levels at Well X, an observation borehole near Rowlands Castle, for over eighty years. It is centrally located within the Company's area, is

unaffected by abstraction and therefore provides a good indication of groundwater resources for the Company.

The spring source at Source B has been used for public supply since 1860 and a long record exists of daily rainfall measured at Havant which, due to its location, is representative of the whole Company area.

These two factors provide the key information required to enable forecasts to be made of resources during forthcoming seasons given different rainfall scenarios.

1.2.2 *Drought Triggers*

Portsmouth Water does not have any surface water storage and the drought triggers have been based on groundwater levels measured at Well X. The triggers are in the form of an annual profile and are set at three different levels:

- Level 1 Calls for Restraint and Additional Leakage Control
- Level 2 Temporary Domestic Demand Restrictions
- Level 3 Non Essential Use Bans and Drought Permits

1.2.3 *Drought Impacts upon Supply*

The impact of droughts on deployable output is considered at average demand and this is referred to as Average Deployable Output (ADO). ADO will vary with the scenario selected with lower figures for less frequent droughts.

In the past Portsmouth Water was driven by peak demands due to the lack of surface water storage. The 'Critical Period' was the peak week in the summer which usually occurred between May and July. Peaks have recently occurred in August when the deployable output at this time is lower. The peak scenario is referred to as Peak Deployable Output (PDO).

The Minimum Drought Output (MDO) of the Company's sources in the autumn of a two-season drought is expected to occur in November and December. This has not been found to be the critical period for the WRMP.

1.2.4 *Drought Impacts upon Demand*

The Company's Water Resources Management Plan 2019 balances yield assessments for a drought scenarios with demand forecasts for the same scenarios through to 2045. A 'dry year' is based on no restrictions in demand. The stated Level of Service in the Water Resources Management (WRMP) is "1 in 20 years", consequently the Company does not expect to employ drought measures more frequently than 5% of years.

1.2.5 *Potential Drought Scenarios*

The Company's Water Resources Management Plan (WRMP) considers a range of plausible droughts which cover the impacts of single and multi-season events. Consideration was given to the WaterUK report 'Water Resources Long Term Planning Framework' which included extreme droughts with return periods of 1 in 500 years. Portsmouth Water have not included these droughts in the Drought Plan but they are covered by the 'Emergency Plan', which due to national security reasons cannot be in the public domain.

1.2.5.1 Single Season Droughts

Portsmouth Water has no significant raw water storage but the South Downs chalk aquifer is very resilient to drought. A single season summer drought is considered unlikely to have a critical effect on the supply/demand balance for Portsmouth Water. Experience from recent dry periods demonstrates the Company's capability to cope with single season dry summers.

1.2.5.2 Multi-Season Droughts

Multi-Season Droughts, i.e. two or more consecutive seasons of below average rainfall, have a much greater impact upon the Company's ability to balance demands with available supplies, especially if they are combined with a dry summer.

To assess the impacts of such droughts the Company has used simulated rainfall data and modelled the impacts on groundwater levels. Four scenarios for multi-season droughts have been developed for the WRMP and the same scenarios have been used for the Drought Plan. It should be noted that three of these scenarios are more severe than the Company has experienced in recent history:-

Scenario 'A' is based upon the Company's experience of Historic Droughts when a dry autumn and winter during the first year was followed by some recovery in year two. The return period for this scenario has been calculated as 1 in 40 years or a 2.5% risk of failure.

Scenario 'B' represents a two year drought with a dry autumn and dry winter during the first year followed by a dry summer in the second year which then extends into the autumn. The return period for this scenario has been calculated as 1 in 80 years or a 1.25 %risk of failure

Scenario 'C' represents a two year drought with a very dry autumn and a very dry winter with no recovery of groundwater levels until the following spring. The return period for this scenario has been calculated as 1 in 125 years or a 0.8% risk of failure.

Scenario 'D' is a three year drought with a dry autumn, a dry winter and with no groundwater recovery until the end of the third winter. This scenario has a return period of 1 in 200 years or a risk of failure of 0.5%.

1.3 Drought Management

Portsmouth Water's customers have high expectations of its ability to manage supplies during a range of drought scenarios. The options for managing a drought comprise:-

Demand Management options - measures which influence customer demand.
Supply enhancement - measures taken to enhance supply availability.

The Company anticipates that it will only need to implement its Drought Plan during a multi-year drought. This will ensure that adequate time is available for planning any actions during the first year , to be implemented in the subsequent year, if the dry weather continues. During the period from September to April each year it is anticipated that there will be sufficient supply to meet demand as this is not a critical demand period. It will be principally be the peak demand months of May to August in a two year drought when actions might be required to ensure that supplies balance demand. The Company currently has no storage available in winter to retain water for use in the summer. As the Company's resource situation is little affected by abstraction, the Company does not plan to apply demand restrictions during the winter period.

Drought trigger profiles have been generated so that in any week of the year the profile can be compared against current groundwater levels at Well X and if 'breached' an early warning given that drought actions may need to be considered. The first trigger results is calls for restraint and the Company's Drought Management Team is convened.

1.3.1 *Drought Management Structure*

The Company's Drought Management Team will be convened when the first drought trigger profile is breached. Meetings will be held as required, usually monthly, but if necessary weekly and the Team will report upon the actions taken to the Executive Team and Company Board.

The Company is expected to participate in the Environment Agency's Regional Drought Co-ordination Groups should other water companies be similarly affected.

1.3.2 *Potential Demand Management Actions*

The Company has identified a number of key actions that might be used to suppress overall demand in order to balance supplies with demand during a drought.

- Appeals to customers for voluntary restraint in their use of water

- Enhanced leakage control by the Company including pressure reduction
- The imposition of temporary bans on certain activities
- The application of further restrictions under a Drought Order

A key element of this Drought Plan is how the Company has proposed to implement the powers afforded to it under the Floods and Water Management Act 2010. These powers allow the Company to choose which activities to ban and when it is appropriate to do so.

1.3.3 *Potential Supply Enhancements*

Potential supply side options are considered in the Plan on a 'twin-track' basis. Most supply side options would be used in response to local water resource problems. Several are largely untested and some are constrained by impacts on the environmental.

The options that have been considered in the Plan are:

- Drought Permits or Orders
- Lowering of borehole pumps to maintain source yields
- Recommissioning unused sources
- Commissioning unused Portsmouth Water boreholes
- Commissioning unused private boreholes
- Increasing drought yields at existing sources

1.3.4 *Impact of Drought Management Actions*

With no surface water storage, the necessity for Drought Control Actions is principally to ensure that, during the peak demand period of May to August, sufficient supplies will be available to balance demand.

1.3.5 *Monitoring Drought Impacts*

In the autumn of 1973, at the end of a dry eighteen month period, groundwater levels fell to an all-time low. As a result chalk streams and wetlands dried out and plants and animals were put under stress for a considerable period of time. There are no historical records of the environmental impacts from that period and climate change may have increase the natural impact of droughts since then.

It may not be possible or politically acceptable to always protect the environment during extreme droughts. A balanced view is needed taking into account the statutory duties to supply water for public health and to protect the environment.

1.3.6 *Environmental Monitoring to Support Drought Order/Permit Applications*

Portsmouth Water has not previously required Drought Orders or Permits and as a result the Company has little experience of conducting the relevant environmental monitoring.

The Company anticipates that it will develop the requirements for such monitoring by dialogue with the Environment Agency, Natural England and Southern Water. Environmental monitoring points have been established in the vicinity of Swanbourne Lake, Arundel, by the Environment Agency. The Environment Agency Groundwater Model can be calibrated to the latest monitoring data and then used to predict the impact of additional abstraction from the 'QRST Group' and more specifically the source at North Arundel. Portsmouth Water has a commitment to work with Southern Water over any potential impacts that additional abstraction could have on Swanbourne Lake and the neighbouring Arundel Wildlife and Wetland Centre SSSI. This includes working on mitigation measures to prevent environmental damage and will include a high level plan outlining these measures.

1.4 Proposed Drought Management Actions

The sequence of Drought Actions will be determined by the Company's Drought Management Team, but will be largely dictated by the severity of the drought and the particular drought scenario that applies. The critical period for maintaining supplies will be the peak demand months of May to August. Company actions may therefore only be required for relatively short durations.

The Company will implement restrictions on customers in a proportionate and phased manner. The proposed phasing is set out below.

- Phase 1 – Appeals for Restraint
- Phase 2 – Temporary Bans
- Phase 3 – Non Essential Use Bans

The timetable for implementing the different phases is dependent on the type of drought being experienced. It is possible to provide an indicative timetable , however, the actual decisions on the date of application of each phase will be taken by the Drought Management Team during the drought.

Table 1 below is an indicative example of how the drought management actions could be implemented in a Scenario 'C' type drought.

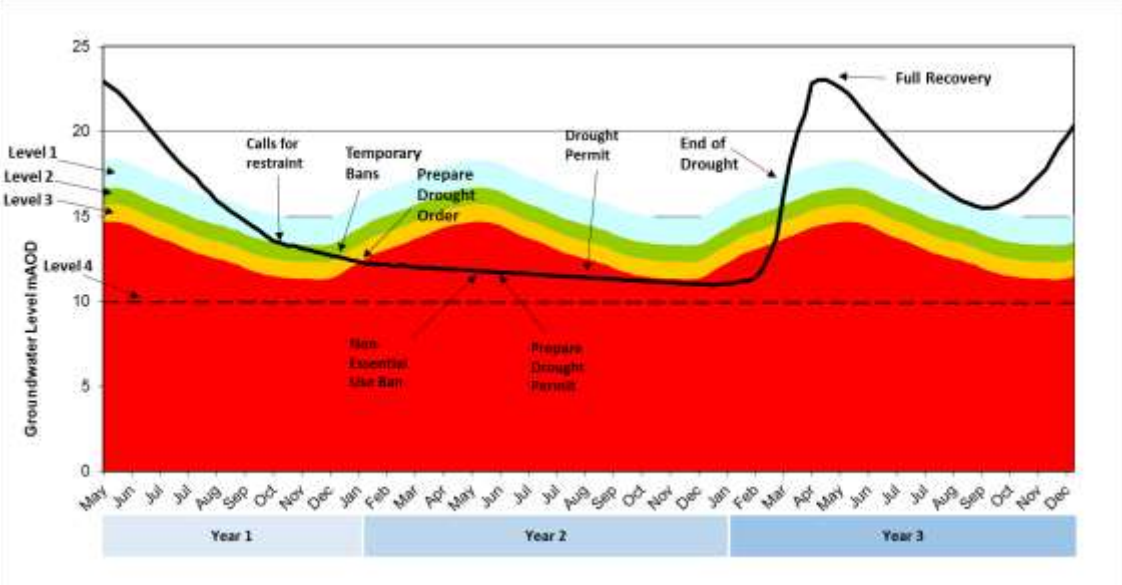

Figure 1: Example of Level Triggers (Type 'C' Drought)

The indicative set of actions demonstrates that the Company believes it can maintain supplies throughout the most severe drought scenario with only recourse to one Drought Permit at the Company's North Arundel Source. There are other potential supply side options which may be needed if conditions occur that are more severe than a Scenario D Drought, this is considered highly unlikely and is covered in the Emergency Plan.

Phase	Drought Measure	Timing
1	Appeals for restraint and enhanced leakage control	October (Year 1)
2	Imposition of a Temporary Ban	December (Year 1)
3	Non-essential Use Ban	May (Year 2)
4	Drought Permit	August (Year2)

Table 1: Example of drought management actions

1.5 Assessment of Drought Management Actions

The Company will run a high profile publicity campaign if there is a likelihood of demand exceeding available supplies. The Drought Management Team will assess the impact of each of its actions before applying further measures, in order to ensure that water supply is balanced with demand throughout the peak period.

Drought Permits may be needed to abstract additional water from sources but these will only be considered when all other available options have been exhausted. The Company recognises environmental data will be needed to support any applications made by the Company and this will be collected in partnership with Southern Water.

1.5.1 *Minimising Impacts upon the Environment*

Droughts are extreme events and, regardless of abstraction, they will inevitably have an effect on the environment. Plants and animals, as well as humans, have adapted to cope with very dry conditions occurring from time to time. Nature has a remarkable resilience which enables it to recover from even the most extreme events and adapt to new conditions.

The Environment Agency and Portsmouth Water have a responsibility under the Water Resource Act and the Habitats Directive to minimise the impact of abstraction upon habitats and species. During a drought it may not be possible to protect every wetland or section of river from the impacts of drought. The need for monitoring and mitigation will be agreed with the Agency, Natural England and other conservation bodies where there is the likelihood that a Drought Permit will be required.

1.5.2 *Drought Communication Strategy*

Communication will play a key part in any Drought Management Actions and will involve the Company, customers and the regulators. It will not be feasible to work to a fixed communication plan since any plan will need to be tailored to the circumstances of a particular drought.

1.5.3 *Drought Co-ordination with Environment Agency and Companies*

The Company anticipates that it is unlikely that a drought will affect Portsmouth Water solely and it is expected that members of the Drought Management Team will develop a co-ordinated communications strategy with the Environment Agency and other Companies.

1.5.4 *Key Public Messages*

The messages used and the method of delivery will be dependent upon the severity of the developing situation. Throughout the campaign, the Company would develop information messages setting out:

- The key reasons for the poor water resource situation
- The actions taken by the Company to date
- The potential for future actions if the situation worsens
- The contact point for further advice
- The actions customers can undertake to help

The Drought Management Team will develop the strategy needed to manage communications using some, or all, of the following delivery methods:

- Regular Press Releases to Local Press, Radio and TV Stations
- Regular Stakeholder Briefing Sheets to the Environment Agency, Natural England, Local Authorities, Consumer Council for Water, Members of Parliament and Trade Associations
- Website messages
- E-mail postscripts
- Social media
- Van-side messages
- Briefing Notes for Customer Services and Distribution staff
- Letters to customers on a water meter
- Official notices in the local press

2 INTRODUCTION

2.1 History of Drought Planning

Portsmouth Water provides an average of 170 million litres of drinking water per day to around 310,000 domestic and commercial customers in south east Hampshire and part of West Sussex.

Throughout the Company's long history, it has paid particular attention to ensuring that it meets its statutory obligations to maintain supplies Drought planning prior to the Water Act 2003 had been informal, but nevertheless a key part of the Company's operational activity for many years.

The most severe drought in the Company's area of supply was in 1976.

At the Water Summit in May 1997, the Government stated its expectation that 'Water Companies agree a detailed and publicly available Drought Contingency Plan'. The Environment Agency published the 'Drought Contingency Planning Guideline' in 1999.

In January 1999, the Government confirmed that legislation would be brought forward to require water companies and the Environment Agency to maintain a plan which includes a full range of demand measures.

2.2 *The Development Of Statutory Drought Plans*

Section 63 of the Water Act 2003 imposed the requirement for water companies to prepare statutory plans as well as the requirement to conduct consultations in their preparation.

Portsmouth Water's current Drought Plan was published in April 2013 following a consultation on the draft plan where representations were received from the following:

- Consumer Council for Water
- Natural England
- Environment Agency
- OFWAT
- Southern Water

2.3 New Legislation

Since the publication of the first Statutory Drought Plan in 2008, the Government has introduced new legislation to the Flood and Water Management Act 2010 and the Water Use (Temporary Bans) Order 2010. This legislation covers temporary restrictions which can be introduced during a drought and the Drought Direction 2016 covers additional measures that can be introduced in more severe droughts.

The new legislation includes a requirement to consult with customers on demand management measures. The Industry has produced a Code of Practice and Guidance on Water Use Restrictions. This Drought Plan sets out the proposed measures as a result of a pre-consultation exercise carried out before the Draft Drought Plan was written.

Following the receipt of representations on the Draft Plan, a Statement of Response has been prepared and this Draft Final Plan will be submitted to the Secretary of State. A copy of the Statement of Response has been sent to each of the Consultees and an electronic copy of the Draft Final Plan has been posted on Portsmouth Water's Web Site. Following directions from the Secretary of State the Final Plan will be published in the Summer of 2018.

2.4 Basis of this Drought Plan

The Company's public water supply sources are all groundwater based with approximately 60% of water supplied from boreholes and wells, 28% from natural springs at Source B, and 12% from Source A, a river abstraction close to the tidal limit on the groundwater dependent River Itchen.

Portsmouth Water currently has no surface water storage reservoirs and hence its ability to maintain supplies during a drought relies upon balancing peak week demands (normally during May to August) with the yield from its sources. The Company has no facility to 'store' water and conserve it during the winter to enable supplies to be maintained during the summer peaks.

A key element of the Company's Water Resources Management Plan is the provision of sufficient source yields to meet peak week demand during a dry summer. The Plan however anticipates that there may be infrequent occasions when demands are likely to exceed the availability of supplies and that the Company will need to take action to ensure that essential supplies are maintained. It is on these occasions that the measures set out in this Drought Plan are likely to be used. Such occasions will occur during periods of drought and their expected frequency is linked to the Company's Level of Service. For example, if the Level of Service for a 'Dry Year' is stated as 1 in 20 , then on average the Company expects to employ drought measures no more frequently than once in 20 years or a risk of failure of 5% in any year.

In October 2007, the Environment Agency notified the Company of the outcome of the Habitats Regulations Review of Consents. The Company has agreed voluntary licence reductions of the following sites to ensure compliance with the Habitats Regulations:

- Source B
- Source N
- Source U
- Source O
- Source P
- Source M
- Source L
- Lower Itchen

Following investigations linked to the Water Framework Directive (WFD) additional licence variations or mitigation measures were agreed at the following sites:

- Source C
- Source I
- Source F

2.5 Portsmouth Water's Resources

Table 2 shows the current licence and deployable output assessment for each of the Company's water sources following a number of recent variations agreed with the EA to ensure compliance with the Habitats Regulations and the WFD.

In a drought, the deployable output of many of the sources diminishes as groundwater levels fall. The most significant decline occurs at Source B Springs, where the abstraction licence is 98 Ml/d, but the Dry Year Output is only 53 Ml/d and the Severe Drought Output is 43 Ml/d.

	Licenced Quantity	1 in 20: Dry	1 in 40: Historic	1 in 80: Extended	1 in 125: Serious	1 in 200: Severe
Lower Itchen	45.50	36.9	31.6	30.3	30.2	20
Source B	98.00	53	47.6	46.6	42.4	42.9
Source C	20.51	17.3	17.2	16.6	16.5	16.3
Source D		1.1	0.8	0.8	0.6	0.8
Source E	0.46	0.4	0.4	0.4	0.4	0.4
Source F	9.02	7.2	7.3	7.1	7.2	6.9
Source G		1.5	1.6	1.5	1.5	1.5
Source H	9.12	7.7	7.6	7.3	7.3	7.2
Source I	6.83	1.5	1.4	1.4	1.3	1.4
Source J	22.73	9.1	8.5	8.5	7.8	8.3
Source K	11.37	9.6	9.5	9.2	9.1	9
Source L	65.04	13.7	13.3	12.9	12.5	12.6
Source M		4.5	3.7	3.5	2.8	3.8
Source N		22.2	22.1	21.3	21.1	20.9
Source O		4.1	2.9	2.8	1.6	2.8
Source P		8.4	8.4	8.1	8	7.9
Source Q	28.38	9.7	9.7	9.7	9.6	9.6
Source R		10.3	10.2	10.2	10.1	10.1
North Arundel		1.9	2	1.9	2	1.9
Source T		6.4	6.5	6.5	6.4	6.4
Total	**317**	**227**	**212**	**207**	**198**	**191**

Table 2: Average Licence and Deployable Output Summary

The Company would like to highlight that work on the National Environment Programme (NEP), which was driven by the Water Framework Directive, has been completed and we do not expect abstraction licences to be reduced further.

2.6 Company's Area of Supply

Portsmouth Water has the capability to transfer water within the Company Area of Supply. This means that there is only one "Resource Zone" as defined by the guidance for the Water Resources Management Plan.

Figure 2: Company Area of Supply

2.7 Bulk Supply to Southern Water

In 2003, Portsmouth Water agreed that it would make available a bulk supply of up to 15 Ml/d to Southern Water's Sussex North Zone until 2013. This transfer capability was commissioned in 2004 and the financial agreements were renewed in 2016. There is an additional connection into Southern Water's Sussex Coastal Zone, but the total volume to be supplied to Sussex cannot exceed 15 Ml/d.

The bulk supply agreement does not guarantee that water will be available to Southern Water under all circumstances. It does include most of the drought scenarios but not the extreme drought scenario that was considered in the Long Term Planning report (1 in 500). This would be subject to Emergency Planning when we consider demand would be significantly reduced.

Following the imposition of a Temporary Ban, Portsmouth Water will inform Southern Water of its plans to apply for a Drought Permit. It will provide Southern Water with reasonable notice that the Extreme Drought conditions are forecast and the bulk supply is expected to be suspended as defined by the Water Industry Act 1991.

2.8 Drought Management Areas

The whole Company supply area is little more than 50 km x 30 km with reasonably well developed 'connectivity' between its built up areas. The sources are not isolated and the connecting links enable transfers between areas if required. As a result, the Company anticipates that it will treat the whole of its supply area as a single Drought Management Area.

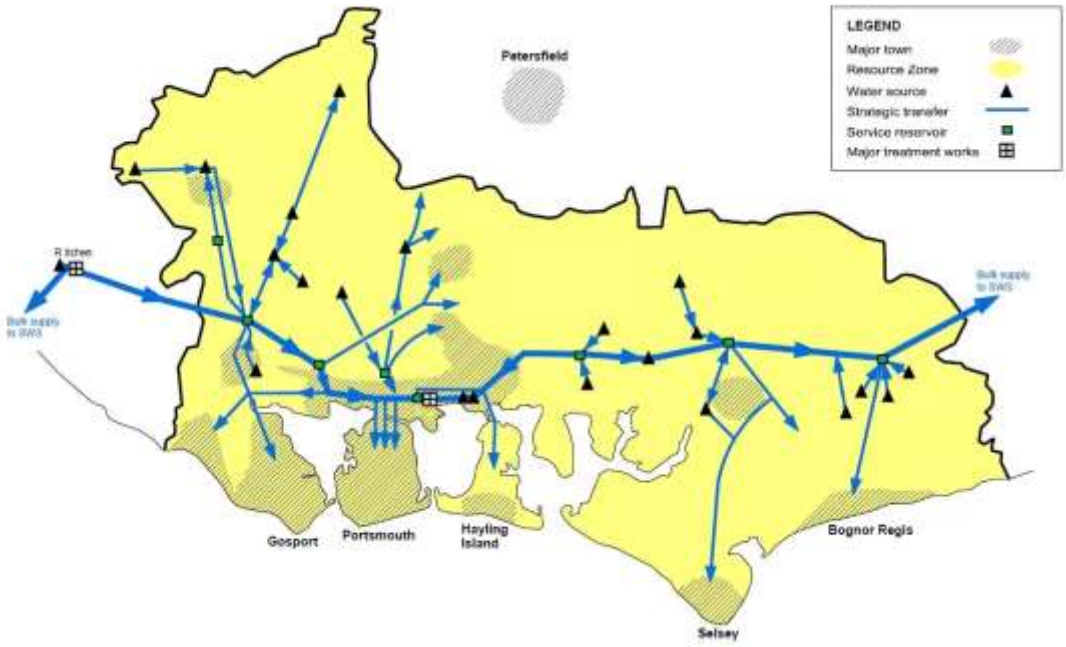

Figure 3: Strategic Resource Zone Map

2.9 Designated Sites

The Drought Plan Guidance states that the plans should consider impacts on designated sites such as Sites of Special Scientific Interest (SSSIs), Special Protection Areas and Special Areas of Conservation (Habitats Regulations). Portsmouth Water's Area of Supply is heavily influenced by designated sites. Figure 4 shows the current Habitats Directive designations which include all the harbours and the River Itchen. Additional marine protection zones have been proposed but these are unlikely to be impacted by fresh water abstraction.

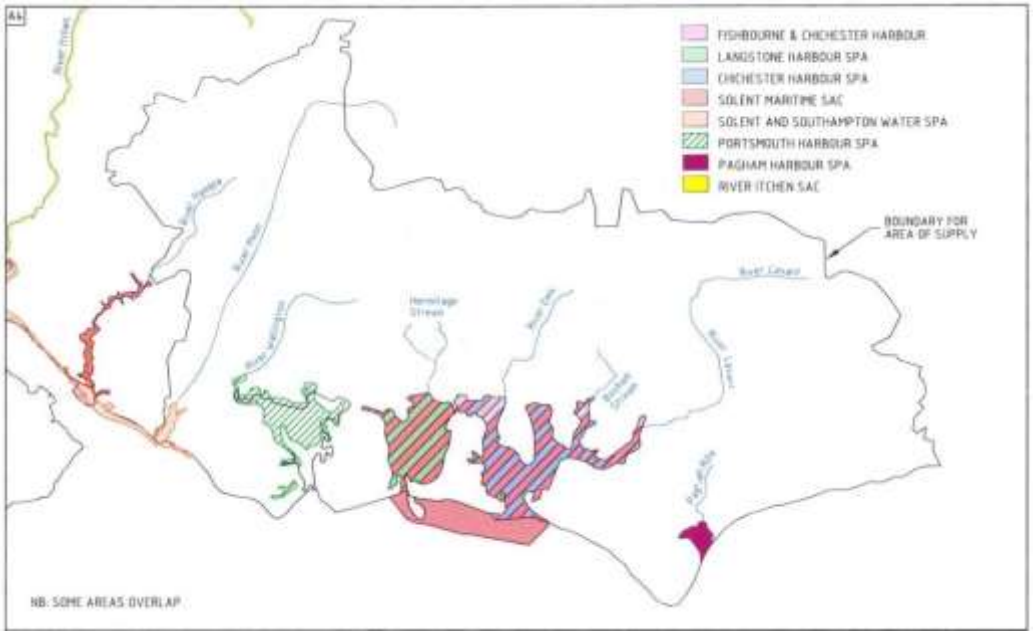

Figure 4: Map of Designated Areas

The Drought Plan is based on the licences and the deployable output assessment included in Section **Error! Reference source not found.**. Several recent licence variations that were nformed by the Habitats Regulations Review of Consents included flow conditions which provide environmental protection to key habitats. These flow conditions are based on scientific data and will be imposed during dry or drought conditions. It is unlikely that the flow conditions will be overturned by a "Drought Permit" application. This is because the evidence shows that the Designated Sites would be damaged by abstraction at this time. Natural England's response to the pre-consultation raised some doubts about the use of Drought Permits on designated rivers.

Further studies for the Water Framework Directive (WFD) were carried out by Portsmouth Water and by the Environment Agency. These investigations resulted in further licence variations and a reduction in deployable output. The Drought Plan is an "operational" plan and Portsmouth Water does not consider that a Habitats Regulation Assessment (HRA) is required. The Company considers that the clauses in the abstraction licences are sufficient to protect the designated sites under dry conditions and that after a drought the environment will recover quickly.

The impact of a drought on a specific SSSI will depend on the features and the timing of the dry conditions. At Swanbourne Lake near Arundel the impacts are linked to abstraction by Portsmouth Water and Southern Water and a joint approach has been proposed. The Environment Agency states in its South East Drought Plan that the impact of abstraction on an already dry lake may be insignificant. An environmental monitoring plan is set out in Appendix 'J' and a Drought Permit for Portsmouth Water's North Arundel Source will also consider Southern Water's separate North Arundel Source.(see Appendix 'L')

2.10 Statutory Process

2.10.1 *Pre-Consultation*

As required by the Secretary of State prior to the preparation of the Draft Drought Plan, Portsmouth Water undertook a pre-consultation with the relevant statutory bodies to inform the preparation of the plan. Responses to the pre-consultation exercise were received from:

Organisation	Representation
DEFRA	• Follow the Formal Guidance and Drought Directions • Clearly state the drought actions, sequence and timings.
OFWAT	• Cover the Drought Plan in the formal pre-consultation meeting with Ofwat • Provide evidence of customer requirements and outcomes • Set out the risks in delivering the Plan including the involvement of others • Consider the Regional aspects of drought planning
Environment Agency	• Set out in the WRMP any drought permits that may be required • Set out any mitigation and monitoring that is required
Natural England	• Drought Permits should be avoided if possible through adequate planning of water resources
Southern Water	• Drought Permits could be avoided through investment in water resources but this needs to linked to the Levels of Service that customers have agreed to

Table 3: Pre-consultation responses

A more detailed description of the requests made by the organisations who were contacted for the pre-consultation can be found in Appendix 'D' and all points have been considered when writing this Plan.

2.10.2 *Consultation*

The Draft Drought Plan was submitted to the Secretary of State on the 1st December 2017 and approved for publication on the 7th December 2018. The Draft Plan was placed on Portsmouth Waters Web Site and an eight week consultation period was carried out as required by Section 39B of the Water Industry Act 1991. A Statement of Response to the representations has been produced and is included as an appendix to this plan.

2.11 Strategic Environmental Assessment Directive

Portsmouth Water did not carry out a Strategic Environmental Assessment (SEA) of the 2013 Drought Plan. The pre-consultation letter for this Plan informed stakeholders that Portsmouth Water would carry out an SEA of the WRMP but not the Drought Plan.

The Company considers that the Drought Plan is not a framework for development and that the impact of potential drought permits on protected sites are not permanent.

2.12 Future Drought Plans

Portsmouth Water will start the cycle to review its Drought Plan if there is either a material change in circumstances or if directed to do so by the Secretary of State. In any event, a review will be conducted no later than 5 years after the date that the Final Plan is published.

3 DROUGHT TRIGGERS AND SCENARIOS

Drought is simply defined as a significant period without rainfall. As public water suppliers, water companies anticipate that drought periods will occur from time to time and they must prepare for such shortages of rainfall. It is only during prolonged and sustained periods of low rainfall, principally during winter periods which impact upon groundwater supplies, that this Plan is likely to be required.

The Environment Agency Guideline suggests that a plausible range of drought scenarios should be considered so that the Plan is flexible enough to cope with historical droughts and future droughts that may be more severe than those previously experienced.

The Plan attempts to balance deployable output expected during these drought scenarios with the likely demands from its customers. The greatest challenge to maintaining supplies is likely to be during the peak demand period of a dry summer. On occasions where the demands are predicted to exceed the available deployable output, the Plan sets out the measures the Company expects to use to maintain essential supplies.

The Company continually monitors rainfall, groundwater level, spring yield and demand data in order to manage the provision of supplies to meet customer demand. The information derived is provided to Senior Managers and Directors on a regular basis. Much of it is also publicly available in the 'Water Supply News' section of its website at www.portsmouthwater.co.uk

3.1 Drought Indicators

As outlined in Section 2, the yield of the Company's groundwater sources is entirely dictated by groundwater levels. Since groundwater levels are dependent upon aquifer recharge during the winter period, the Company monitors both rainfall and groundwater levels to enable it to forecast the level of deployable output from its sources during the months ahead.

The Environment Agency Guideline suggests that triggers such as groundwater levels should be built into 'control curves' which can be used to influence drought management actions. These have been developed principally to manage the use of water from surface water storage reservoirs. As Portsmouth Water does not have any significant surface water storage, it does not have any reservoir control curves but it has developed groundwater drought triggers which enables it to identify the time when the deployable output from sources may be insufficient to meet customer demands.

In developing a Drought Plan, it is important to identify triggers which are of practical benefit to those managing the supply/demand balance on a daily basis. In recent years, Portsmouth Water

has not had to implement any water use restrictions. Water use restrictions were last imposed in 1976.

The Company anticipates that it will continue to monitor both rainfall and groundwater levels which will enable it to calculate its supply availability during critical periods each year.

3.1.1 *Groundwater Level Monitoring*

Groundwater levels have traditionally been used by Portsmouth Water to indicate the likely yield of springs, wells and boreholes. A former private estate well now used as an observation borehole near Rowlands Castle, has been monitored for over eighty years and a thirty year average profile is used to monitor seasonal variations from average conditions.

Levels are also compared with those from previous drought years in order to provide an early indication of a developing drought situation. The eighty year record covers all of the most significant droughts for Portsmouth Water.

Well X, as it is known, is not affected by abstraction and hence is a very good indication of groundwater resource availability from the South Downs Chalk. All of the Company's sources are situated within the same overall chalk aquifer and the well is situated centrally within the Company's supply area, and the Hampshire / West Sussex border. None of the Company's sources, both East and West, are more than 25km from Well X.

Well X is upstream of the Source B Springs which are Portsmouth Water's largest source. Groundwater levels in the well are an excellent indicator of the springs yield as well as being representative of levels at the majority of the other groundwater sources which abstract from the same aquifer.

The Environment Agency has an alternative groundwater monitoring site at Source Z in West Sussex. This site has a long record of levels beginning in 1836 and is situated in the same chalk aquifer. Although the measured groundwater levels Above Ordnance Datum (AOD) are different from Well X, the slope of the curves and the relationship of critical years to the Long Term Average (LTA) are similar.

3.1.2 *Rainfall at Havant*

The Company's spring source at Source B has been in use for public water supplies since 1860. In recognition of the importance that winter rainfall plays in the recharge of the aquifer and the influence that this has on the springs yield, the Company has been recording the daily rainfall at Havant since 1886.

Havant is situated conveniently centrally in the Company's area of supply, thus providing a useful indicator of the status of groundwater conditions for the whole of the Company' area. It is also just 5km south of the divide between the overlying tertiary layer and the unconfined chalk to the north which supports the Company's principal source at Source B Springs.

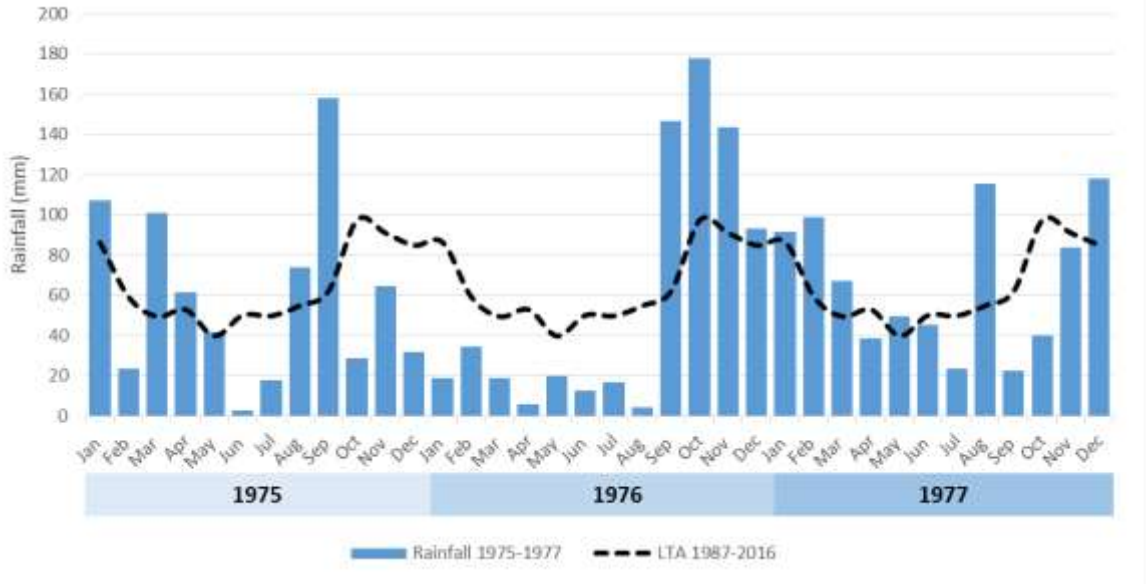

Figure 5: Historic Monthly Rainfall at Havant 1975-1977

The groundwater of the chalk aquifer of the South Downs is principally dependent upon annual recharge from winter rainfall.

For Portsmouth Water it is not just the amount of rainfall but also the time of year that rain occurs which influences our water resource situation. The graph above shows the Long Term Average (LTA) rainfall for Havant and compares this with actual rainfall in 1975-1976 this being the last year Portsmouth Water introduced demand restrictions. In 1975, rainfall was 95% of the LTA for the year and in 1976 it was 93% of LTA. This demonstrates that for Portsmouth Water the percentage of LTA rainfall is not a good indication of a drought. Winter rainfall (October-April) is a better measure and for 1975-1976 the total was 203mm and this resulted in low groundwater levels in the summer of 1976. (See Appendix 'A')

The probability of this winter rainfall occurring can be calculated by looking at the historical data. The following graph shows one possible relationship which fits the data relatively well.

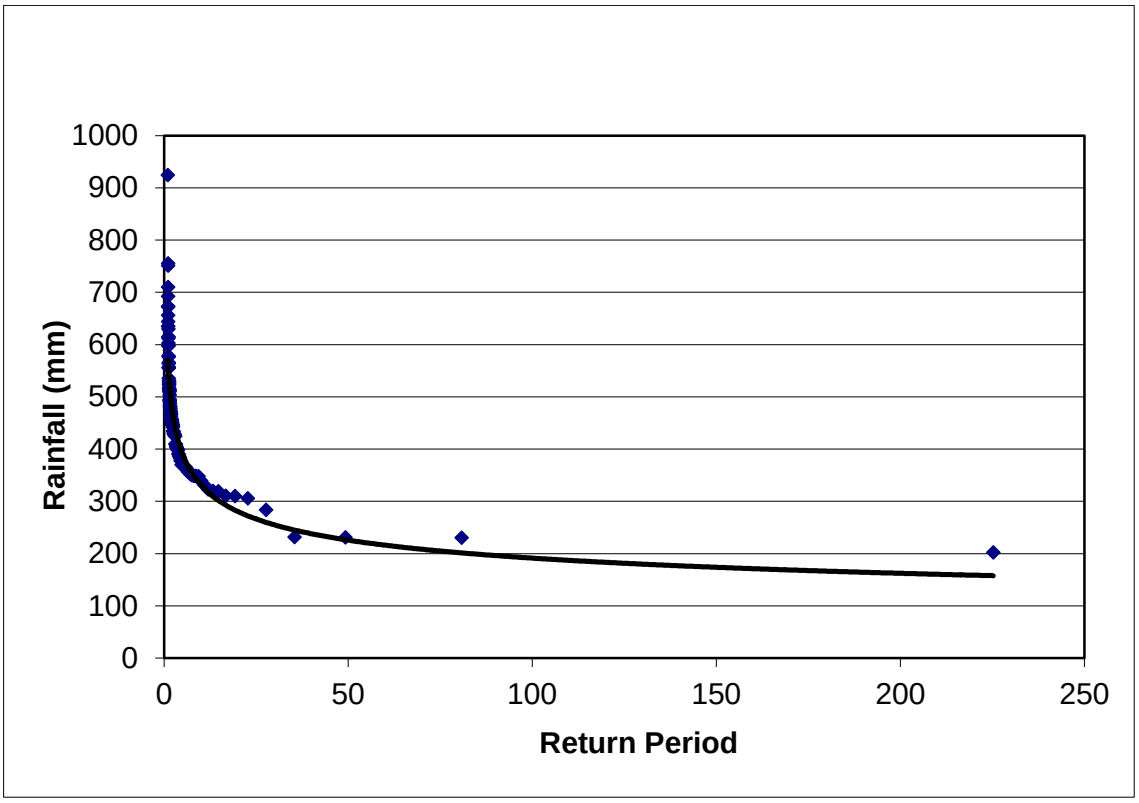

Figure 6: Return Period of Winter Rainfall

Analysis undertaken on historical rainfall data allows a relationship to be developed between the amount of rainfall experienced in the winter period and the likelihood of this occurring in a given year.

This relationship implies that the low winter rainfall in 1975-76 was a rare event with a return period of around 1 in 80 years. The Company's WRMP is based upon an initial Level of Service (LOS) of 1 in 20 years for the imposition of Temporary Bans. This means that on average the Company will implement the first phases of the Drought Plan once in twenty years or with a 5% risk of failure of the level of service.

3.2 Drought Triggers

Historical experience has shown that sufficient resources are available within the aquifer across the Company's area when ground water levels at the Well X monitoring borehole are above 13.3m AOD. Water levels have only fallen below 13.3m AOD on three occasions:

- 12.70m AOD Dec 1973
- 12.95m AOD Dec 1990
- 13.15m AOD Nov 1989.

Although groundwater levels do fall close to 13.13m AOD they have only continued to decline beyond this level during multi season droughts. On all occasions the careful management of demand has ensured that customers received an adequate supply of water.

Dry autumns result in the continued recession of groundwater levels into the winter period. Records show that the lowest yearly groundwater level can be anticipated to occur during December or early January. The lowest groundwater level ever recorded was 12.70m AOD in the winter of 1973. In the 12 months preceding the this, below average winter rainfall resulted in minimal recharge from an already low groundwater level of 13.3m AOD in November 1972. Groundwater levels rose to 16.7m AOD in February 1973 before declining to an all time low.

A trigger profile has been generated based on the Company's groundwater level records. The profile is derived from the minimum weekly average groundwater levels, excluding the 5% most extreme events. This represents a 1 in 20 return period which is the level of service for just avoiding any demand restrictions. Not surprisingly, the minimum trigger point is 13.3m AOD in early December, with a maximum trigger point of 16.7m AOD in mid May. The benefit of the trigger profile is that in any week of the year it can be compared against current groundwater levels and an early warning given that drought actions may need to be considered.

This is known as a 'Level 1' trigger and represents the change from normal operations to drought management actions. The first action would be calls for restraint from customers. Further triggers can be produced to initiate demand restrictions such as Temporary Bans. This is known as a 'Level 2' trigger and has been set as one metre below the initial trigger. The trigger to initiate Drought Orders such as Non-essential Use Bans and drought permits is called 'Level 3' and this has been set two meters below the initial trigger. The final trigger is the limit for Drought Plans and represents the introduction of the Emergency Plan. This trigger is called 'Level 4'.

There is also an 'Upper Trigger' which is set 1.6m above the 'Level 1' trigger and this represents the end of the drought when there is full groundwater recovery.

The Environment Agency say that it is up to the Water Company to prove to the SoS that there is an 'Exceptional Shortage of Rain'. This is one of the criteria for implementing Drought Orders and Drought Permits and it is therefore a drought trigger. Portsmouth Water will use it's existing Havant rain gauge to monitor rainfall throughout the drought. Long Term Average (LTA) rainfall Is already used to characterise droughts and monthly deficits can be used to monitor droughts as they progress.

In addition to this other Companies have used Standard Precipitation Indices (SPI) and Drought Severity Indices (DSI) to assess vulnerability in their areas of supply. These indices are internationally accepted approaches to measuring drought severity.

Portsmouth Water will use these approaches in the early stages of a drought so that the results are available to inform the decision to implement 'Non Essential Use Bans' and 'Drought Permits'.

3.3 Potential Drought Scenarios

Portsmouth Water's groundwater sources in the South Downs chalk are dependent upon winter recharge and there are several drought periods which have occurred where little or no winter recharge has taken place. In such circumstances source yields in the following summer are reduced and groundwater levels reach their lowest levels at the end of the second year. Since 1836, these droughts have always ended with rainfall and recharge during the following spring.

The Environment Agency Guideline suggests that a Drought Plan should be able to cope with a range of plausible droughts as set out in the Water Resources Management Plan (WRMP). These should include:

- Short duration one season droughts (6-12 months)
- Medium duration multi-season droughts (1-2 years)
- Long term droughts (2-3 years)

Portsmouth Water's Draft Drought Plan 2018 is based on the same scenarios as the WRMP with a range from a 'Dry Year' to a 'Severe Drought.

The Scenarios are detailed in Section 3.2.3 of the WRMP and are summarised as follows:

- Dry Year 1 in 20
- Scenario 'A' Historic Drought 1 in 40
- Scenario 'B' Extended Drought 1 in 80
- Scenario 'C' Serious Drought 1 in 125
- Scenario 'D' Severe Drought 1 in 200

These droughts cover the plausible range that Government has suggested with the Reference Level of Service for a Severe Drought at 1 in 200. Extreme Droughts (1 in 500) are not covered by the Drought Plan but by a separate Emergency Plan which also covers other resilience issues such as flooding or major source works pollution.

In terms of Long Term Average (LTA) Rainfall each drought is different but the scenarios can be related to an overall shortage of rainfall:

- Scenario 'A' 70% LTA Rainfall
- Scenario 'B' 60 % LTA Rainfall
- Scenario 'C' 50% LTA Rainfall
- Scenario 'D' Less than 50% LTA

3.4 The Impact of Drought on Deployable Output

The Company's Deployable Output Assessment, conducted for the Water Resources Management Plan, considered historic operational data and simulated data. The simulated data is based on regional estimates of rainfall and temperature and groundwater levels are calculated for Well X.

The relationship between groundwater levels at Well X and the Source B Spring Flow is very strong. The following graph shows a polynomial trend fitted to the historical data from 1969-2009.

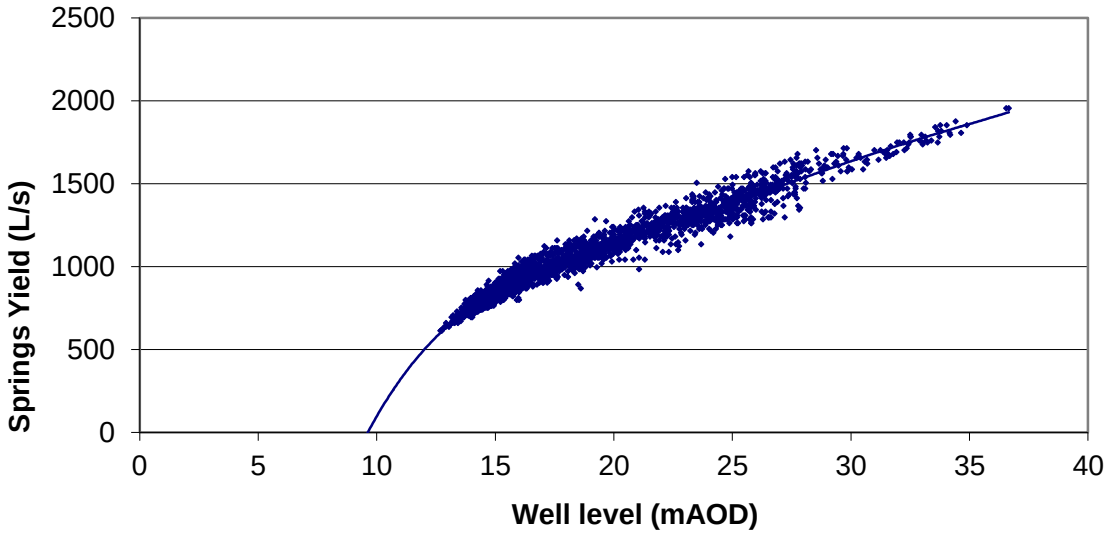

Figure 7: Well Level/Spring Flow

The lowest recorded spring yield of 53.5 Ml/d (619 l/s) occurred in 1973 and coincided with the lowest recorded groundwater level and the spring yield for that year exhibited a similar sloped curve to that of the groundwater recession.

The Average Deployable Output (ADO) of all the sources has been calculated for all the drought scenarios. These figures are set out below:

Return period	ADO Ml/d	PDO Ml/d	MDO Ml/d
1 in 20	227	280	252
1 in 40	212	270	237
1 in 80	207	263	233
1 in 125	198	252	234
1 in 200	191	236	222

Table 4: Average Deployable Output (ADO)

Compared to the previous Drought Plan the Dry Year Deployable Output is 20 Ml/d lower and this has an impact on the WRMP which includes drought options. Demand interventions such as Temporary Bans and Non-essential Use Bans are selected by the WRMP as and when required. These actions are then passed on to the Drought Plan which ensures that they are implemented under the correct circumstances.

Minimum Deployable Output (MDO) coincides with minimum groundwater levels which occur in the Autumn. This is not the critical output scenario because it is a snapshot and does not take account of Annual Licence constraints. MDO has not been used in the WRMP or the Drought Plan.

At peak demand periods groundwater levels are normally higher and so are source yields. This is called Peak Deployable Output (PDO) and this can be the Critical Period of a drought. PDO has been calculated for all the drought scenarios and for all the sources. The results are set out below:

Sourceworks	1 in 20: Dry	1 in 40: Historic	1 in 80: Extended	1 in 125: Serious	1 in 200: Severe
Lower Itchen	40.6	40.6	40.6	40.6	39.4
Source B	57.8	52.1	48.7	43.9	39.0
Source C	22.5	22.5	22.5	22.5	21.8
Source D	2.4	2.1	1.9	1.7	1.5
Source E	0.5	0.5	0.5	0.5	0.4
Source F	11.7	11.9	12.1	11.9	8.8
Source G	3.3	3.1	2.9	2.6	2.3
Source H	9.1	9.1	9.1	9.1	8.8
Source I	2.1	2.0	1.9	1.9	1.8
Source J	10.2	10.2	10.2	7.9	7.9
Source K	12.3	12.2	12.2	12.2	13.2

Source L	15.5	15.0	14.7	14.3	13.6
Source M	6.0	4.8	3.9	2.8	2.0
Source N	35.2	35.2	35.2	33.9	30.7
Source O	4.2	2.7	1.7	1.3	1.0
Source P	10.0	10.0	10.0	10.0	10.0
Source Q	12.4	12.1	11.6	11.7	11.2
Source R	13.5	13.1	12.5	12.6	12.0
North Arundel	2.5	2.5	2.4	2.5	2.4
Source T	8.5	8.4	8.0	8.2	7.8
Total	**280**	**270**	**262**	**252**	**235**

Table 5: Peak Deployable Output by Site

Compared to the previous Drought Plan the Peak Deployable Output is 50 Ml/d lower in a Dry Year as a result of the Deployable Output reassessment undertaken as part of the Water Resource Management Plan (WRMP) process. This change has also been included in the WRMP and has affected the selection of Drought Options to balance supply and demand.

3.5 Drought Impacts upon Demand

The Company's previous Water Resources Management Plan, published in August 2014, included deployable outputs for a range of droughts from a 'Dry Year' to a 'Severe Drought'. A 'Dry Year' for demand purposes is related to the Level of Service (LOS) that customers receive before the imposition of demand restrictions. Demand restrictions will, on average, be introduced once in every 20 years. This represents a 5% risk of restrictions occurring in any given year.

The Level of Service is also used to determine the return period for the Peak Week. At a return period of 1 in 20 peak demand is expected to be 27% higher than average demand. As drought related demand restrictions are imposed, the amount of water used becomes constrained. This suppression of demand is the main mechanism that Water Companies use to balance supplies in a drought.

The Company's Water Resources Management Plan forecasts a range of demand management and resource development options to ensure that sufficient resources are available to meet expected demands in drought years throughout the planning period.

4 POTENTIAL DROUGHT MANAGEMENT ACTIONS

As a result of the Company's past experience, Portsmouth Water's customers have high expectations of its ability to manage supplies during a range of drought scenarios.

Government and Regulators expect companies to ensure that sufficient resources are provided to just meet their Level of Services and that from time to time Drought Management Action will be needed.

The options for managing a drought can be divided into demand side options and supply side options. In general, the demand options involve measures which are intended to influence customer demand and the supply options involve measures taken by the Company to enhance supply availability. Portsmouth Water has no direct experience of the impacts of drought demand management since the last Temporary Ban in the area was implemented in 1976.

The Company believes that the majority of single season dry periods will fall within it's stated Level of Service of 1 in 20 years. The Company only anticipates the implementation of the Drought Plan for multi-season droughts and this should ensure that adequate time is available for planning any actions that are necessary.

4.1 Drought Management

Ground water levels are monitored weekly, with figures reported and considered by senior staff at the Company's Monday morning Operations Meeting. Depending on the rate of recession of groundwater levels when the first drought trigger is breached the Company's Drought Management Team will be convened.

Under any given Drought Scenario if groundwater levels just touch the 'Level 1' trigger at the end of the first year then consideration will be given to asking for customers voluntary restraint. As the drought develops in the second year and the 'Level 2' trigger is crossed then demand restrictions will be implemented. When the 'Level 3' trigger is crossed the Company will consider Drought Permits and Drought Orders which include Non-essential Use Bans.

If following a breach of a trigger level aquifer recharge occurs but is insufficient for groundwater levels to rise above the 'Upper Trigger', the Drought Management Team will continue to meet, and the retention of drought measures will be considered.

When groundwater levels rise above the 'Upper Trigger' the Drought Management Team will no longer be required to meet. Although the decision will be for the Team itself to make taking into account rainfall, long range weather forecasts, source outages, and bulk transfers.

4.1.1 *Drought Management Team Membership and Internal Reporting*

The Drought Management Team will consist of the following personnel:

Personnel	*Responsibility*
Engineering Director	Overall responsibility for technical issues, including Water Quality, Supply, and Capital Works And Distribution Network and for external communications.
Distribution Manager	Manages water main distribution network, including responsibilities for leak repair.
Customer Services Manager	Manages customer billing and Company call centre.
Personnel Manager	Responsibility for co-ordinating water efficiency actions.
Water Quality Manager	Ensures water quality standards are achieved.
Investment Manager	Plans and implements asset management plan; responsible for capital works improvements.
Supply Manager	Monitors groundwater levels and rainfall, responsible for the operation of sources, water treatment works and service reservoirs and feeds information to Team as required.

Table 6: Drought Management Team

The Drought Management Team will meet at least once a week. The Team will report upon actions taken at least once a week to the Company's Executive Team and once a month to the Full Company Board.

4.1.2 *External Reporting*

The Company anticipates that when the Drought Management Team is convened, it will immediately open dialogue with the Environment Agency. If there are other companies experiencing similar conditions, it anticipates that the Agency will set up its Regional Co-ordination Group and, if so, one member of the Team will be the designated Company representative on that Group.

Since there will be the need for both communications with the Media and possibly other Company/Agency Media contacts, the Team will designate a representative for communications issues.

4.1.3 *Customer Drought Awareness*

At an early stage, informal contact will be made with Southern Water, with whom the Company has bulk supply agreements, with a view to sharing information and understanding their needs for continuing with water transfers during a drought.

Contact will also be made with other agencies / customers who may be affected by the proposed drought measures. These could include:

- Environment Agency
- Natural England
- English Heritage
- Local Authorities
- West Sussex County Council
- Hampshire County Council
- OFWAT
- Consumer Council for Water
- Customer Challenge Group
- Health Authorities
- Police
- Fire Authorities
- Representative bodies such as CBI
- Residential Care Homes
- Age UK
- Hospitals
- Schools
- Special needs customers
- Customers generally
- Horticultural Trades Association
- Citizens Advice Bureau
- Window Cleaners Trade Associations
- National Farmers Union

4.1.3.1 Early Engagement

The Company believes that none of the scenarios considered require drought management actions that have the potential to impact the provision of water for firefighting supplies. It would take an unprecedented event such as a major pollution event combined with a drought to pose such a risk. In this case, communication would take place with the Fire Brigade under the auspicious of the Emergency Plan.

It has also been recognised that communications are required with the agricultural sector and although the Environment Agency have control over agricultural abstraction, Portsmouth Water will engage with stakeholders such as the National Farmers Union to agree early and managed reductions in demand in this sector. Hence the National Farmers Union has been added to the list of agencies that may be affected by drought measures.

4.2 Potential Supply and Demand Management Actions

This section sets out the potential supply and demand management options that are available to the Company. It does not necessarily follow that the options listed below will be required in all drought scenarios. The purpose of setting out the potential drought options is to demonstrate the assessment and screening of all drought management options the Company has considered. This will make it clear to the stakeholders how the Company has sought to balance the needs of their customers, as well as minimising the impacts these options may potentially have on the environment.

The Company has identified a number of key actions that might be used to suppress overall demand in order to balance supplies with demand during a drought:

- Appeals to customers for voluntary restraint in their use of water
- Enhanced leakage control by the Company including pressure reduction
- The imposition of temporary bans on certain activities
- The application of further restrictions under a Drought Order

Since drought actions are only likely to be needed for multi-season droughts, it has been assumed that additional promotion of water efficiency measures would have taken place by the time that drought actions are considered. No significant reductions in demand are anticipated from additional water efficiency promotion but the coverage in the local Media is likely to set the context for further appeals for restraint.

The range of activities likely to be used by the Company will be determined by the Drought Management Team and they are detailed in the following sections of this Plan.

4.2.1 *Appeals for Voluntary Restraint and Leakage Reduction*

Continued low rainfall and reducing source yields would require more direct appeals for voluntary restraint in the press and, if possible, local TV, Newspaper Advertisements, Radio Commercials and Notices on Vans.

As customers are asked to curb demand, it is important that the Company is seen to be minimising leakage levels. This could involve additional leakage detection resources and a higher priority for repairing leaks. It is essential that visible leaks are repaired as quickly as possible, if necessary by the use of contract labour. Bad publicity caused by lost water can undermine the impact of calls for customer restraint. In warmer and drier weather, ground movement occurs as the soil dries out. Additional leakage can be anticipated, and thus without additional manpower for detection and repair, leakage could be expected to rise in drought years.

Pressure Management is already carried out for 70% of Portsmouth Water's customers and this has a significant impact on overall demand and leakage. Sophisticated controls are applied to the Distribution Network to enable the Company to vary pressures in the network at different times of the day. During a drought it may be possible to further reduce day time pressures to suppress demand and leakage.

The combined impact of calls for voluntary restraint and additional active leakage control is expected to reduce demand by 2.5%.

4.2.2 *Temporary Bans*

Sprinkler and Hospipe Bans are now called “Temporary Bans” as set out in Section 36 of the Flood and Water Management Act 2010. The statutory instrument for imposing bans is the Water Use (Temporary Bans) Order 2010.

In addition, the legislation for Ordinary Drought Orders has been updated as detailed in the Drought Direction 2016. “Non-essential Use Bans”, which cover demand management for commercial customers, is covered by the Drought Direction.

Defra’s Drought Plan Guidance sets out how the new legislation works (Appendix ‘C’) and the Water Industry has produced a ‘Code of Practice and Guidance on Water Use Restrictions’ (Appendix ‘K’). The Code is intended to ensure that water restrictions are:

- Consistent and transparent
- Proportionate
- Communicated clearly

- Considers representations in a fair way

Any representations made on temporary restrictions will be recorded and the exact method of response will depend on the number and nature of representations that are made.

The legislation and the guidance produced by the Environment Agency, calls for representations to be taken into account in determining the implementation and application of restrictions. Portsmouth Water has assumed that the Draft Drought Plan 2018 represented the first stage of this public consultation. Representations on the Draft Plan were considered by Portsmouth Water and set out in 'Statement of Response' (see Appendix 'M'). These comments have inform the Draft Final Drought Plan 2018 which sets out the proposed demand management actions. Having determined the strategy for implementing restrictions in this Drought Plan, the Company will notify its customers through Public Notices in local newspapers press releases and its website to advise of the implementation programme.

The Defra Guidance also states that companies should consider phasing of temporary water use restrictions. They also suggest that temporary use restrictions should be fully implemented before any applications for "Drought Permits" are made. Drought permits allow companies to abstract more than the licensed quantity from a river or from an aquifer.

4.2.2.1 Phasing of Temporary Bans

Portsmouth Water has considered the phasing of temporary water use restrictions. Once the first drought trigger has been crossed, and the Drought Plan implemented, then the initial actions will take place in the early part of the second year of drought.

The legislation sets out the following uses which can be included in a Temporary Ban:

- 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
- 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

Garden watering could be included in an initial phase of a temporary ban because the biggest impacts would apply in early spring. This is when bedding plants are being watered and lawns are starting to grow.

4.2.2.2 Justification of a Temporary Ban

Although no customer research was explicitly undertaken for this Drought Plan research for the Business Plan 2019 showed that customers accepted the need of Temporary Bans and were prepared to have them imposed in 5% of years. This represents a Level of Service of 1 in 20 years on average. Portsmouth Water also took part in a working group with other water companies in the South East to agree a common approach to temporary bans, making use of research carried out by other companies.

Imposing temporary bans on garden and plant watering is consistent with previous plans. It is clear in that reducing garden watering and plant watering by hosepipe has a demand management benefit in the early months of a drought. Communicating the need to reduce garden watering and ways in which the impacts can be mitigated is an important message.

The imposition of garden sprinkler bans and Hosepipe Bans in 1976 resulted in a 15% fall in demand. The introduction of metering and 'exceptions' for certain customers means that the impact of temporary bans is likely to be much smaller now. This Plan assumes a benefit of 5% at average demand and this is consistent with recent experience in other Company areas.

Other activities such as cleaning cars, boats and domestic windows use smaller volumes of water. They are also likely to be impacted by general calls for restraint as the drought develops. Using water for recreational purposes such as paddling pools, ponds and water play has increased in recent years but restricting use is more an issue of fairness rather than the savings that are likely to result.

Restricting garden watering will have an impact on the horticultural trades. The Company believes that the timetable for a developing drought would allow trades to modify their purchasing decisions and time to develop drought mitigation measures. The Company considers that horticultural trades should develop "Drought Contingency Plans" in the same way as the Water Industry.

The legislation for temporary use bans allows companies to specify exceptions or concessions to groups so they can remain unaffected by the ban. For clarity, below are the circumstances where we believe concessions are appropriate and not appropriate.

4.2.2.3 Concessions to be Permitted

Concessions will be permitted for elderly and disabled residents based on Portsmouth Water's Priority Services Register or by written application. Portsmouth Water will write to all those on the register to explain the situation. This information will also be published on the website and other communications with customers would enable customers to apply for exemption. The concession will be for that residence only and will be for the use of a hose (both handheld and adapted for irrigation) for watering plants and gardens but not lawns, though we would ask customers to apply restraint. Applications can be made in advance to go on the register and customers will be considered on a case by case basis.

The Company will use the Priority Services Register to identify vulnerable customers so the Company can put in place the necessary actions to ensure customers are protected. As part of the communications strategy, the Company will work with various organisations to seek advice on how to protect vulnerable customers.

Following representations from the Horticultural Trades Association (HTA), Portsmouth Water has decided to allow the use of micro irrigation systems in a drought. These must be fitted with a pressure reducing valve, a timer, must not be handheld and are exempt from all but the most severe drought scenario.

A concession will also be given to the use of drip irrigation systems where possible. This concession will be given in a Scenario 'A' and a Scenario 'B' drought, however, this concession would not be given in a more severe drought such as Scenario 'C' with a nominal return period of greater than 125 years or a Scenario 'D' drought with a nominal return period of 1 in 200 years. Recent reviews of sensitive environmental sites have led to variations of abstraction licences to protect them from significant damage. In the Company's opinion, it would not be appropriate to apply for drought permits at designated sites while continuing to allow the use of these drip irrigation systems during a severe drought.

Concessions will be permitted for Commercial Customers cleaning domestic windows. Portsmouth Water is aware of the impact that restrictions have on commercial window cleaners. Many window cleaners now use pole mounted hose systems that use much less water than previously. In a serious drought window cleaning would be restricted and the financial impact on local businesses could be significant. Portsmouth Water will offer temporary positions within the Company to those window cleaners who have lost work to help with leakage control efforts and other drought related activities.

4.2.2.4 Concessions Not to be Permitted

Concessions will **not** be permitted for newly landscaped gardens. Customers and developers will need to heed the early publicity about potential drought conditions. The Company considers it is proportionate that new homes should be sold without plants or turf in drought conditions.

Concessions will **not** be permitted for newly laid turf. The Company states that policing this type of concession would not be practical.

Concessions will **not** be permitted for allotments which are defined as "gardens" under the legislation.

Concessions will **not** be permitted for sports or recreation grounds which are defined by the regulations as "gardens". Public Authorities such as District Councils and Parish Councils have a duty under the Water Act 2003 to promote water conservation. Portsmouth Water will expect Authorities to fulfil this commitment by developing their own "Drought Contingency Plans". These will include plans to reduce or modify municipal planting in the run up to the imposition of restrictions for domestic customers. This will set a similar precedent to leakage control by Water Companies in sharing the burden of responding to a drought.

Local Authorities are responsible for many sports and recreation grounds and these should not be watered once the 'Temporary Ban' is introduced. If the sports ground is deemed to be "unsafe" due to the hardness of the ground, then it should be closed. This will avoid the need for "Health and Safety" exemptions under the Water Use (Temporary Bans) Order 2010.

Temporary bans do **not** cover the watering of plants at commercial premises or the cleaning of windows at commercial premises.

4.2.2.5 Impact on Demand of a Temporary Ban

Portsmouth Water does not have any recent experience of drought management and the new legislation is likely to change the way which customers behave. In 1976, the Temporary Ban and national publicity surrounding the Drought Act caused demand to fall significantly over a prolonged period. The Company's weekly average demand of 200 Ml/d in May 1976 fell to about 170 Ml/d by August 1976. This represented about a 15% reduction which is consistent with the figures published in the 1998 UKWIR Report on the impacts of drought measures. The significant reduction in demand was, however, in the context of an overwhelming "national situation" and publicity was sustained over a long period. The Company does not believe that a 15% reduction was entirely the result of hosepipe restrictions as a number of other initiatives were promoted such as putting bricks in toilet cisterns.

During more recent droughts in parts of the South East, a number of water companies imposed Temporary Bans for prolonged periods. The bans were associated with a concerted media

campaign and one company also imposed a non-essential use ban. The reduction in demand varied but the Temporary Ban is believed to have reduced peak demand by up to 15% although the precise effect of the ban may have been masked by other actions.

In light of the recent changes in legislation, Portsmouth Water believes that conservative figures should be used to estimate demand reductions. A Temporary Ban is expected to deliver a 5% reduction in overall distribution input. This has been reduced following the introduction of the concession for domestic and commercial customers.

4.2.2.6 Policing of Temporary Bans

Policing of 'Temporary Bans' will be difficult and will require co-operation between customers, regulators and Portsmouth Water's staff. Although a penalty could be issued of £1000 (level 3 of the standard scale of fines as outlined in section 32 of the Criminal Justice Act 1982), the response to those who have flouted the 'Temporary Ban' will be one of education to ensure they are aware of the current water resources situation and of peer pressure to follow the temporary restrictions whilst they are in place. Further details maybe found in the Flood and Water Management Act 2010.

4.2.3 *Drought Orders*

In the previous Drought Plans the legislation included 'Non Essential Use Bans' which were part of the Drought Order process. This covered uses such as watering public parks, filling swimming pools and washing commercial vehicles. With the changes in legislation some of the non essential uses have been transferred to the 'Temporary Ban' category.

Portsmouth Water has never had to impose any restrictions on non-essential use but voluntary restraint from both domestic and commercial customers was evident in 1976 and through 1977. A water company in the South East imposed a non-essential use ban in 2006 which appears to have suppressed peak demand by up to 30% compared with their 2003 peak.

Portsmouth Water have assumed that a 'Non Essential Use Ban' would only reduce demand by a further 5% at average demand and 10% at peak demand. This is because of the impact of the concessions now available to commercial customers.

The current legislation is set out in the Drought Direction 2016. This still requires an Ordinary Drought Order under the Water Resources Act 1991 which is related to an "exceptional shortage of rain".

4.2.3.1 Phasing of Drought Orders

Portsmouth Water envisages that a 'Drought Order' that would restrict the use of water in some commercial activities would be arranged as the other domestic control measures were implemented. This is due to the fact that the process for obtaining a 'Drought Order' is likely to require a public consultation and a public inquiry/hearing. The individual restrictions would only be implemented if demand continued to rise.

If a 'Drought Order' was imposed following 'Appeals for Voluntary Restraint' and a 'Temporary ban', then demand would reduce significantly. This reduction would remain for the length of the drought unlike 'Temporary Bans' which are only likely to be effective during the summer.

The Drought Direction 2016 allows Water Companies to restrict the use of water for the following purposes:

- Watering outdoor plants on commercial premises using a hosepipe
- Filling or maintaining a non-domestic swimming or paddling pool
- Filling or maintaining a pond
- Operating a mechanical vehicle washer
- Cleaning any vehicle, boat, aircraft or railway rolling stock using a hosepipe
- Cleaning non-domestic premises using a hosepipe
- Cleaning a window of a non-domestic building using a hosepipe
- Cleaning industrial plant using a hosepipe
- Suppressing dust using a hosepipe
- Operating cisterns in an unoccupied building

It is envisaged that some or all of these purposes will be covered by each Drought Order application.

4.2.3.2 Impact on Demand of Drought Orders

Drought Orders are only required for more severe droughts and the additional demand effect is assumed to be a 5% reduction in distribution input. This saving will be the subject of review as operational experience of the new legislation is obtained.

4.2.3.3 Concessions Permitted

There are concessions for watering plants for sale at commercial premises. There are concessions for swimming pools open to the public, pools under construction, pools used for medical or veterinary purposes. There are concessions for the cleaning of vehicles, non-domestic buildings and industrial plant for health and safety reasons. There are concessions for using a hosepipe to suppress dust for health and safety reasons.

Concessions may be available for water efficient plant watering on request and filling ponds by customers on the Priority Services List.

4.2.3.4 Concessions Not Permitted

Concessions will **not** be permitted for watering outdoor plants at commercial premises.

Concessions will **not** be permitted for commercial swimming pools that are not open to public. In a severe drought it is proportionate to restrict commercial pools and in many cases the pool is not the primary source of income. Hotel and sports club customers are expected to understand the need for restrictions and public alternatives are available.

Concessions will **not** be permitted for commercial building cleaning. Window cleaners who have lost work as a result of this restriction will be offered temporary positions within the Company to help with leakage control and other related activities.

Concessions will **not** be permitted for mechanical vehicle washers. Vehicle washers with water recycling should be encouraged for day to day use but do not give the right water conservation message in a Severe Drought. Car washes are not considered to be the primary source of income at garages and supermarkets. Staff employed at hand held jet wash establishments could transfer to hand washing which would be permitted. Hand washing establishments could see an increase in trade due to transfers from mechanical car washers and domestic customers unable to use pressure washers at home.

Concessions will **not** be permitted for the day to day cleaning of vehicles, boats or rolling stock. It is anticipated that Local Authorities will voluntarily reduce vehicle washing at the start of a drought as part of their commitment to water conservation. Bus and train cleanliness is very apparent to customers but is also a good example of the impact of a Severe Drought and the need for cooperative working. The cleaning of aircraft is likely to be permitted on health and safety grounds.

Dust suppression will only be permitted on health and safety grounds and to reduce environmental pollution but the use of alternative or recycled water should be considered.

The restriction on operating cisterns in any building that is unoccupied and closed is difficult to interpret. The legislation specifically refers to automatically operated cisterns that are connected to toilets or urinals. Unoccupied and closed is assumed to mean at night or out of term time for educational establishments. This is the very time when the automatic controllers provide the greatest savings. They only operate when people are present and for an occasional hygiene flush. It is possible that the legislation was aimed at old style siphon operated cisterns that filled and emptied continuously. If the system is continuous it should be replaced with a

PIR Controller to ensure water efficiency. If it is not replaced then the building would need to be isolated from the water supply at night or out of term time to comply with the direction. Educational establishments are often empty at the most critical times for public water supply in the summer.

4.3 Levels of Service

Portsmouth Water has no surface water storage and thus has no ability to manage supplies to meet a given level of service. To date demand restrictions have only been applied once during the drought of 1976.

The Water Resources Management Plan 2019 is based on an initial level of service of 1 in 20 years. This means that there is a 5% risk of temporary restrictions in any given year. The supply/demand simulations used in the Water Resources Management Plan match this level of service with demand exceeding supply fifty times within the 1000 year stochastic sequence.

Analysis of actual ground water levels indicates that the initial drought trigger would only have been crossed in 1934, 1973, 1976 and 1992. This cross check shows that Portsmouth Water's stated level of service is robust.

4.4 Supply Management Actions

The Company has also considered various supply side options. Included is an estimate of the additional resource that might be available and the environmental monitoring required. Most supply options are not considered to be feasible in the WRMP they are largely untested and some are restrained by the need to obtain environmental permissions.

The Company recognises that the need to obtain environmental data is important, especially for supply side options such as Drought Permits. Therefore the Company has been working with Southern Water on monitoring programme for supply related options in advance of application. More details can be found in Appendix 'J' and Appendix 'L'.

The supply options that were considered are:

- Lowering of borehole pumps to maintain source yields
- Recommissioning unused sources
- Recommissioning unused Portsmouth Water boreholes
- Recommissioning unused private boreholes
- Internal transfers
- Drought Permits or Orders

- Increasing the drought yields at existing sources

4.4.1 *Lowering of Borehole Pumps to Maintain Source Yields*

The majority of the Company's sources rely upon submersible pumps which are located in wells and boreholes. Since aquifer levels are lower during drought years, the Company maintains a small stock of additional 'rising mains' which may be needed to lower the level of pump intakes. This will ensure that pumps can continue to operate despite reduced groundwater levels.

4.4.2 *Recommissioning Unused Portsmouth Water Sources*

4.4.2.1 Bishops Waltham

The abstraction licence for the Company's source at Bishop's Waltham was surrendered in 2003 due to environmental concerns affecting the Moors SSSI. The site has now been decommissioned and permanent plant removed. Provision has been made to enable the installation of temporary pumps, power supplies and disinfection equipment in the event that the source is needed. However, detailed environmental monitoring, modelling and testing would be required to determine the likely drought yield. The Environment Agency has a groundwater model of the area but no modelling has been carried out. It is highly unlikely that this source could be used in a drought and it is not considered to be a feasible option.

It should be noted that the requirements of the Drinking Water Inspectorate must also be met before any source is returned to supply. This procedure typically takes a minimum of 3 months, although the regulations make provisions for the process to be undertaken more quickly in exceptional circumstances.

4.4.2.2 Hayling Island

Portsmouth Water had a source at Hayling Island which has not been used since the 1920s. Recommissioning would require new pumps, disinfection plant, a power supply and a reconnection to the distribution system. The extent of treatment required is unknown as are the likely yield and water quality. . It is highly unlikely that this source could be used in a drought and it is not considered to be a feasible option.

Water quality investigations would also need to take place by the DWI before any source can be used for public water supply, which can take up to 3 months, and the installation of temporary pumps, power supplies and disinfection equipment will also add time to the process, so 3 – 6 months would be a likely time period.

4.4.2.3 Source U

Source U has recently been converted into a raw water supply for augmenting the River Ems in dry conditions. This has involved the removal of the chlorinators and physical disconnection from the distribution system. New pumps are due to be installed to match the raw water flow of 35 l/s which represents 3.0 Ml/d.

It would be possible to recommission the works in an Extreme Drought but this would require a package UV treatment plant and new chlorinators to ensure water quality compliance. The ability to supply potable water has been retained in the Licence but the DWI would require water quality testing prior to the source being recommissioned.

It is highly unlikely that this source could be used in a normal drought and it is not considered to be a feasible option.

4.4.3 *Commissioning Unused Portsmouth Water Boreholes*

Some of the existing source works contain shafts and boreholes that are not currently used. In an extreme drought it might be possible to increase the yield of a source by installing temporary pumping plant in these unused boreholes. The yield from such boreholes is untested and the WRMP does not consider these options to be feasible.

It should be noted that any activity is subject to complying with the constraints of relevant abstraction licences. However, there is a presumption against further groundwater abstraction and Drought Permits would be required before increased pumping of these sources could be implemented.

As stated in 4.4.2, the Company must undertake assessments of the water quality from the source as set down by the DWI before water is supplied to customers and this could take up to 3 months. Constraints such as access are not an issue because we already own the land.

4.4.4 *Commissioning Unused Commercial Boreholes*

There are a number of unused private boreholes within the Company's area which might have spare licence capacity to augment public water supply sources in an extreme drought. The Company has obtained a list of these sites from the Environment Agency and, in the event of a developing extreme drought, will make contact with site owners to prepare plans to make use of any spare capacity for public water supplies. Any source must have DWI approval before being used to supply customers.

The WRMP does not consider these to be feasible options and they were not included in the SEA or the HRA assessments.

4.4.5 *Internal Transfers*

In general Portsmouth Water has a well-connected supply system with the ability to transfer water between different parts of the Company's area.

The Company does not anticipate the need for additional transfers even in an extreme drought. However, when operational problems occur at a particular site, it may be necessary to add new transfers or reverse the flow of existing transfers by emergency temporary works.

4.4.6 *Drought Permits*

The Environment Agency has powers under the Environment Act 1995 to authorise modifications or suspend flow conditions contained in abstraction licences. The Company is expected to apply to the Environment Agency for a Drought Permit if it wants to suspend flow conditions. Alternatively, the water company can apply to the Secretary of State for a Drought Order under the Water Resources Act 1991. All of the possible permits were considered as drought options in the Water Resources Management Plan (WRMP) and the associated Strategic Environmental Assessment (SEA) and Habitats Regulation Assessment (HRA).

4.4.6.1 Source H

At Source H the peak licensed output is constrained when the flow in the adjacent River Meon falls below a certain level. The Company could apply for a Drought Permit to suspend the flow condition but this is not considered to be a feasible option.

4.4.6.2 Source N

The licence for Source N incorporates a condition requiring the Company to provide a compensation discharge to the nearby River Ems when the flow in the river is below a set level at Hampshire Farm, Westbourne. It would be possible for the Company to apply for a Drought Permit to suspend this condition but this is not considered to be a feasible option.

4.4.6.3 Source B

Source B Springs are Portsmouth Water's largest source and the abstraction licence has been modified to comply with the outcome of the Habitats Directive Review of Consents. The licence has Minimum Residual Flow (MRF) conditions on the Langstone Mill Stream and the Brockhampton Mill Lake.

The Company could apply for a Drought Permit to suspend these conditions. However the flow conditions were explicitly set to protect the environment under dry or drought conditions. The conditions are based on scientific research and the habitats are protected under European legislation. This is not considered to be a feasible option.

4.4.6.4 North Arundel

The Peak Deployable Output (PDO) of the 'QRST Group' of sources at Source Q, Source R, Source S and Source T is currently limited by the abstraction licence to 41 Ml/d. The Group licence is also constrained by a requirement not to abstract more than 2,100 Ml in any period of 60 days.

A Drought Permit has been proposed to enable the group licence limit to be exceeded. Abstractions from the 'QRST Group' sources are believed by the Environment Agency to impact upon Swanbourne Lake at Arundel. It is essential to bear in mind that a Drought Permit application would only be made in a Serious Drought when the Lake would already be empty and there is unlikely to be any additional effect on the water environment. Environmental monitoring requirements have been developed with Southern Water and are set out in Appendix 'J' and Appendix 'L'.

Portsmouth Water's North Arundel Source was originally licensed to 11 Ml/d in 1991 but this was then reduced in 1996 to 2.5 Ml/d due to its assumed impact on Swanbourne Lake . The Lake is an artificial feature and relies on groundwater flows to maintain its level. In a serious drought, despite dredging carried out in 2002, the lake will dry out and the wetland features will be impacted. Under such serious drought conditions it may be acceptable to abstract additional quantities of water at Arundel North. A Drought Permit to increase abstraction by 8.5 Ml/d was included as an option in the WRMP and this was selected as a preferred option in Serious Droughts (1 in 125) and Severe Droughts (1 in 200).

In the Environment Agency's South East Drought Plan (July 2011) there is an acknowledgement that Swanbourne Lake may not be impacted by the Drought Permit. The site is an SSSI and further investigations will be required to confirm no permanent damage is caused to the site by the Drought Permit. The Environment Agency has a ground water model of the area, the East Hants and Chichester Chalk (EHCC) model and this can be used to help investigate the impacts. The Groundwater Model can be run by Southern Water but Portsmouth Water do not have the capability to run ground water models themselves.

The 'QRST Group' abstraction licence also has a condition that during June, July and August in any 60 day period, abstraction should not exceed 2,100,000 cubic metres. It is unlikely that this condition will cause a constraint during a drought however it may be necessary to apply for a drought permit to suspend it.

On this basis, Portsmouth Water propose to apply for a Drought Permit to increase the daily abstraction limit at Arundel North by 8.5 Ml/d to 11.0 Ml/d and to increase the daily peak of the group licence to 49.5 Ml/d under drought conditions. Drought conditions are defined by a serious shortage of rainfall and the implementation of the demand management elements of the Drought Plan. All of the demand management measures must be in place before the Drought Permit will be approved. Portsmouth Water will work closely with Southern Water on the environmental impact of this drought permit and the impact of their own North Arundel Source.

It should be recognised that this drought permit could pose a potential risk to the historic environment. Lowering the water table, due to increased abstraction at this group of sources,

may cause 'dewatering' on archaeological deposits. Although there are no records of any archaeological deposits in the area English Heritage will be able to provide further advice on this matter at the time. Portsmouth Water intends to contact English Heritage as part of the process for applying for a Drought Permit at Source S.

Potential derogations relating to this permit have already been considered during the application for the original licence. People with concerns had the opportunity to raise these issues during the licence application process and mitigation measures were considered at that time. As the source was originally licensed for the higher quantity any derogation would have already been assessed.

Possible constraints, such as access to land are not an issue as this permit relates to a borehole on our own land and therefore we have the access to it as and when necessary.

4.4.6.5 Lower Itchen

The River Itchen has been the subject of a detailed sustainability study under the Habitats Regulations. The Site Action Plan, published in October 2008, set out a Minimum Residual Flow (MRF) condition of 194 Ml/d at Riverside Park. This condition is included in the current Licence which Portsmouth Water implemented in September 2011.

The MRF is designed to protect the ecology of the river between Portsmouth Water's Lower Itchen Works and the tidal limit at Riverside Park. This protection specifically applies to dry or drought conditions.

4.4.6.6 'LMNOP Group'

A group licence has been established for six West Sussex sources, the largest of which is Source N. One of the conditions of the individual licences that make up the group is for reduced abstraction at Source P between August and November. This condition is designed to protect freshwater flows into Chichester Harbour. The group licence and the abstraction limits are the outcome of the Habitats Directive Review of Consents.

Portsmouth Water could apply for a drought permit to exceed the abstraction limits at Source P. The limits are specifically designed to protect the environment in dry or drought conditions and so the application is unlikely to be acceptable to the Environment Agency. This is not considered to be a feasible option in the WRMP.

4.4.7 *Bulk Supplies to Southern Water*

The first Bulk Supply to Southern Water delivers water from Portsmouth Water's Littleheath Service Reservoir via Whiteways Lodge reservoir to Southern Water's Pulborough Source on the River Rother. It was completed in 2004 and is capable of supplying up to 15 Ml/d at all times. It is the subject of a ten year agreement signed in 2016 and due for re-negotiation in 2021.

In 2018 a link was be provided at the Lower Itchen Works to enable Southern Water's to take an additional 15 Ml/d of water at all times. This will be subject to an operational agreement which includes supplying water in serious and severe droughts.

It is possible that in some circumstances the volume of water made available to Southern Water could be reduced in order to secure sufficient supplies for Portsmouth Water's customers. This is more likely to be under emergency conditions such as pollution of a source rather than drought conditions. There will be financial penalties to pay if conditions of the operational agreement are not met.

4.4.8 *Lower Itchen Drought Order*

Southern Water has been unable to comply with the requirements of the Habitats Directive Review of Consents on the River Itchen. This means that they will need to continue to abstract water at SRN Source A, under drought conditions, and this will affect the availability of water at the Lower Itchen Works. This is only a temporary situation and the issues should be resolved by 2030. In the meantime Southern Water will need to have the ability to apply for a Drought Order at Portsmouth Water's Lower Itchen Works to overturn the Minimum Residual Flow Condition (MRF) in Portsmouth Water's abstraction licence.

Southern Water have proposed a relaxation of the flow condition from 194 Ml/d to 150 Ml/d to be measured at Riverside Park in Southampton. This relaxation would allow Portsmouth Water to continue to abstract up to 30 Ml/d at it's works to satisfy the bulk supply and Portsmouth Water's existing needs.

Portsmouth Water would like to emphasise that this Drought Order is necessary to secure Southern Water's supplies in a drought. It is not required to supply Portsmouth Water's customers and is not part of Portsmouth Waters Drought Plan. Any compensation or mitigation will be provided by Southern Water at their expense.

The need for the Drought Order will be reviewed every five years as part of the normal drought planning process.

4.4.9 *Drought Management by Scenario*

Portsmouth Water does not have any surface water storage reservoirs and therefore do not have any conventional control curves for drought contingency use. Historically the Company have used groundwater levels to monitor the water supply situation and to compare trends with critical years.

With no surface water storage, the necessity for Drought Management Actions is principally to ensure that during the peak demand period of May to August sufficient supplies will be available to balance demand.

Groundwater levels remain the key drought indicator since these levels affect springs, well and borehole yields. They also provide the base flow in the River Itchen which supports the Company's Source A abstraction. The following figures show groundwater control curves with triggers for:

- Implementing the Drought Plan (Level 1)
- Introducing Temporary Bans (Level 2)
- Introducing Drought Orders (Level 3)
- Removing restrictions at the end of the drought (Upper Trigger)

Between these triggers are "Zones" which represent the possible time period over which the drought actions are implemented. The Defra Drought Plan Guideline gives examples of control curves for surface water and Portsmouth Water has developed a similar approach for groundwater levels using the same colour coding system. To test the robustness of the groundwater control curves developed, historical data has been tested against the curves to establish if the appropriate actions would have been triggered.

4.4.9.1 Drought Management Actions

The following sections set out potential timetables for drought management actions for each of the scenarios. The exact timings will depend on the actual weather conditions and the decisions of the Drought Management Team.

There is a danger if the triggers and zones are too prescriptive that this will hamper the efficient management of a future drought. Triggers and zones can be modified in future plans if experience shows change is required. Supply availability has been determined using the source yields outlined in Section 2.5. It should be noted that these source yields are derived from simulated weather data and do not represent actual outturn data.

The drought management actions will be implemented in four phases depending on the severity of the drought.

Phase 1: Appeals for restraint and enhanced leakage control.

Phase 2: Imposition of a Temporary Ban which restricts domestic consumption.

Phase 3:Imposition of the Drought Order which restricts commercial demand.

Phase 4: Additional abstraction as a result of the issuing of a Drought Permit.

4.4.9.2 Scenario 'A' Indicative Drought Management Actions

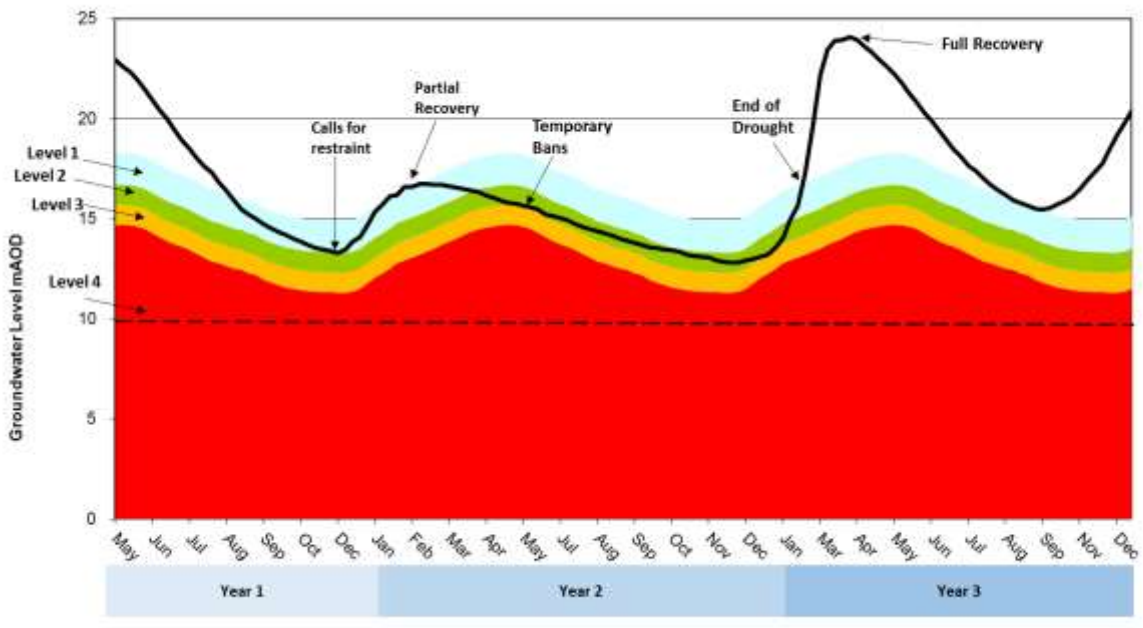

Figure 8: Scenario 'A' Drought

The figure above represents Scenario 'A' or the 'Historic Drought' which simulations give a return period of 1 in 40 (2.5% risk of failure). This is based on the lowest ground water levels recorded at Well X. The initial drought plan trigger 'Level1' is used to determine the start of the drought planning process. In some years no further actions will be required and calls for restraint and additional leakage control will be sufficient to meet the supply/demand balance. In this example 'Temporary Bans' are triggered at the end of April in the second year.

Groundwater levels enter the green zone, which represents calls for restraint, and just touches the orange zone which represents temporary bans. None of the other triggers are crossed until the end of the drought in the third year.

The Drought Management Team would be working with the Environment Agency and neighbouring Water Companies.

Phase	Drought Measure	Timing
1	Appeals for restraint and enhanced leakage control	December (Year 1)
2	Imposition of a Temporary Ban	May (Year 2)
3	Non Essential Use Ban	Not Required
4	Drought Permit	Not Required

Table 7: Scenario 'A' Drought Actions

Appeals for restraint and enhanced leakage control are assumed to result in a 2.5% reduction in demand and bring demand back towards the supply available.

The range of measures employed would be based upon the extent of the projected deficit in supplies as compared to forecast demands, together with the level of effectiveness of each stage of measures. These would be determined by the Drought Management Team as the drought develops.

Notification of the possible need for a 'Temporary Ban' would be made by the end of March with the aim of introducing restrictions by mid May. Restrictions imposed in early summer would be expected to reduce demand by 5% allowing for the concessions that have now been made.

After the end of May demand will rise with warmer weather and the impacts of additional personal washing. For example, when the peak week occurs in August deployable output will be falling again. Under Scenario 'A' some headroom is maintained in the summer between supply and demand (See appendix 'I').

Headroom is required to allow for the inaccuracies of the demand forecasts and uncertainties about the source yields. Loss of works due to pollution or mechanical failure is already allowed for in the Water Available for Use (WAFU) figure.

Under Scenario 'A' the trigger for 'Drought Orders' is not crossed and Phase 3 of the demand restrictions are not required. It would be prudent to consider a 'Drought Permit' in September (Year 2) and think about implementation if groundwater levels continue to fall. If the drought permit is not required then there is no increase in the amount of water available.

When the peak week has passed, demand is expected to fall away rapidly. The final drought trigger is then used to determine when to remove the 'Temporary Ban'. Under Scenario 'A' this would be around January as winter rainfall caused groundwater levels to rise rapidly.

Even under Scenario 'A' Portsmouth Water would continue to monitor rainfall and groundwater levels after the drought had ended.

4.4.9.3 Scenario 'B' Indicative Drought Management Actions

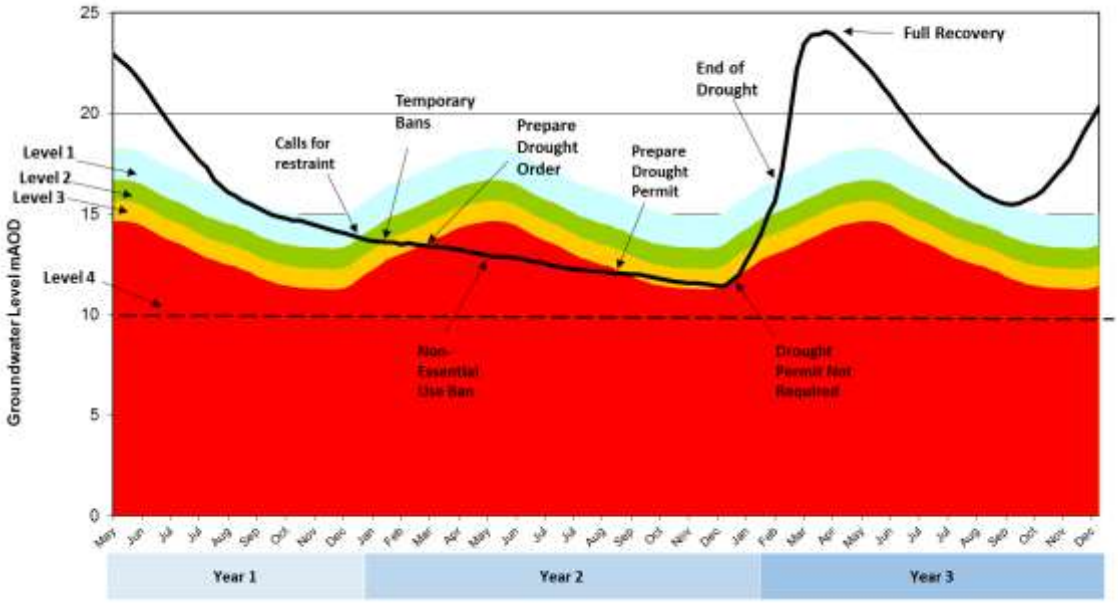

Figure 9: Scenario 'B' Drought

Under Scenario 'B' the there is no recharge in the first winter and groundwater levels continue to fall over the whole of the second year. This scenario represents an 'Extended Drought' which the simulations give a 1 in 80 year return period (1.25% risk of failure). The first trigger is crossed at the end of December and there are calls for restraint and extra leakage control activities. The second trigger is crossed in January and 'Temporary Bans' are introduced in time to influence the spring and summer garden watering season. If there has been a sufficient shortage of rain fall then 'Non Essential Use Bans' will be introduced to restrain non household demand in the summer. This is the third trigger and takes groundwater levels into the red zone.
In this example the 'Temporary Ban' restrictions stay in place for more than six months and the 'Non Essential Use Bans' are not removed until the drought has ended in February of the third year.

As outlined in Section 3.3, Scenario 'B' assumes a dry winter following average conditions in the preceding summer. Scenario 'B' anticipates insufficient rainfall to provide any recharge during

the winter and this is followed by a dry summer and autumn through to December. It is anticipated that the first trigger level will be crossed in December and that groundwater levels remain below the trigger until the following spring.

Scenario 'B' would have a shorter time sequence of drought management actions compared to Scenario 'A'. There would be less time to prepare temporary bans and drought orders but the lack of winter recharge makes the need for restrictions more obvious.

Phase	Drought Measure	Timing
1	Appeals for restraint and enhanced leakage control	December (Year 1)
2	Imposition of a Temporary Ban	January (Year 2)
3	Non Essential Use Ban	May (Year 2)
4	Drought Permit	Not Required

Table 8: Scenario 'B' Drought Actions

Notification of the need for a Temporary Ban would be made by the end of December with the aim of introducing restrictions by the end of January. Restrictions are expected to reduce demand by 5% (See appendix 'I').

With falling groundwater levels in the spring, an application would be made for a Drought Order with further restrictions on demand and the possibility of relaxed licence conditions at Arundel North. Although included in this plan, and the Environment Agency's South East Drought Plan, it is unlikely that the Drought Order would be available before August under any scenario.

The lowest groundwater levels would be reached in December with recovery starting in January or February. The 'Temporary Ban' would remain in force in case the drought continued into a third year. The 'Upper Trigger' would be used to help decide when to remove the remaining restrictions. This decision would be taken by the Drought Management Team but would also be influenced by the national situation and the actions of neighbouring companies.

4.4.9.4 Scenario 'C' Indicative Drought Management Actions

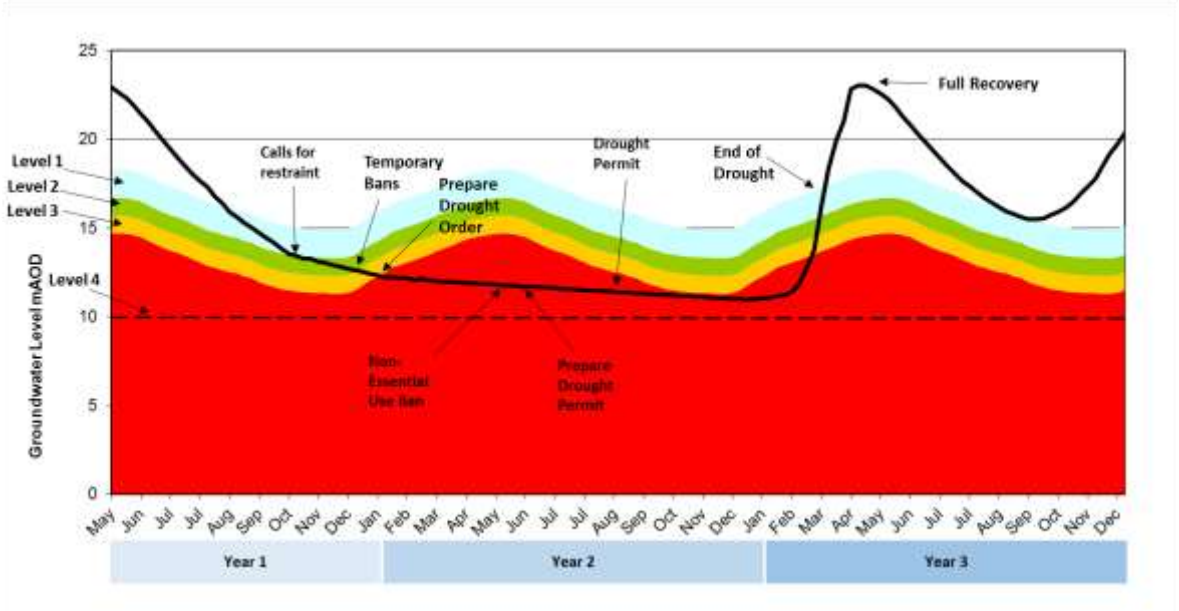

Figure 10: Scenario 'C' Drought

The figure above shows data for a Scenario 'C' a 'Serious Drought' with lower rainfall in the first Autumn and no recharge over the whole of the next year. The graph indicates that a 'Temporary Ban' would have been introduced in December. The 'Non Essential Use Ban' would be instigated in January and would need to be in place for the peak demand period in August. The drought would have ended at the beginning of the third year with winter recharge. The blue zone shows removal of the 'Temporary Ban' and 'Non Essential Use Ban' when recharge was confirmed.

Assuming that the first trigger 'level 1' is breached in the autumn of the first year this would enable the Drought Management Team to put in place the actions needed to balance supplies with demand in the following summer.

Due to the serious nature of this Drought Scenario, no concession would be offered for micro irrigation. Impacts on the environment mean that as little water should be used on gardens as possible, even at night.

With lower yields available from sources in a 'Serious Drought' it might be necessary to apply for the Drought Permit in year two . This would produce an additional 8.5 Ml/d of supply for a short time during the summer. The application process would start in May with implementation expected in August when groundwater levels were already low.

As with the previous Scenarios it would be for the Drought Management Team to make the appropriate decisions as the drought develops.

Phase	Drought Measure	Timing
1	Appeals for restraint and enhanced leakage control	October (Year 1)
2	Imposition of a Temporary Ban	December (Year 1)
3	Non-essential Use Ban	May (Year 2)
4	Drought Permit	August (Year2)

Table 9 Scenario 'C' Drought Actions

The source yields at lowest groundwater levels have been simulated and are subject to uncertainty. As demand fell in the Autumn of year two the output of North Arundel could be reduced. It would be prudent not to remove the demand restrictions until groundwater levels rise above the 'Upper Trigger'.

4.4.9.5 Scenario 'D' Indicative Drought Management Actions

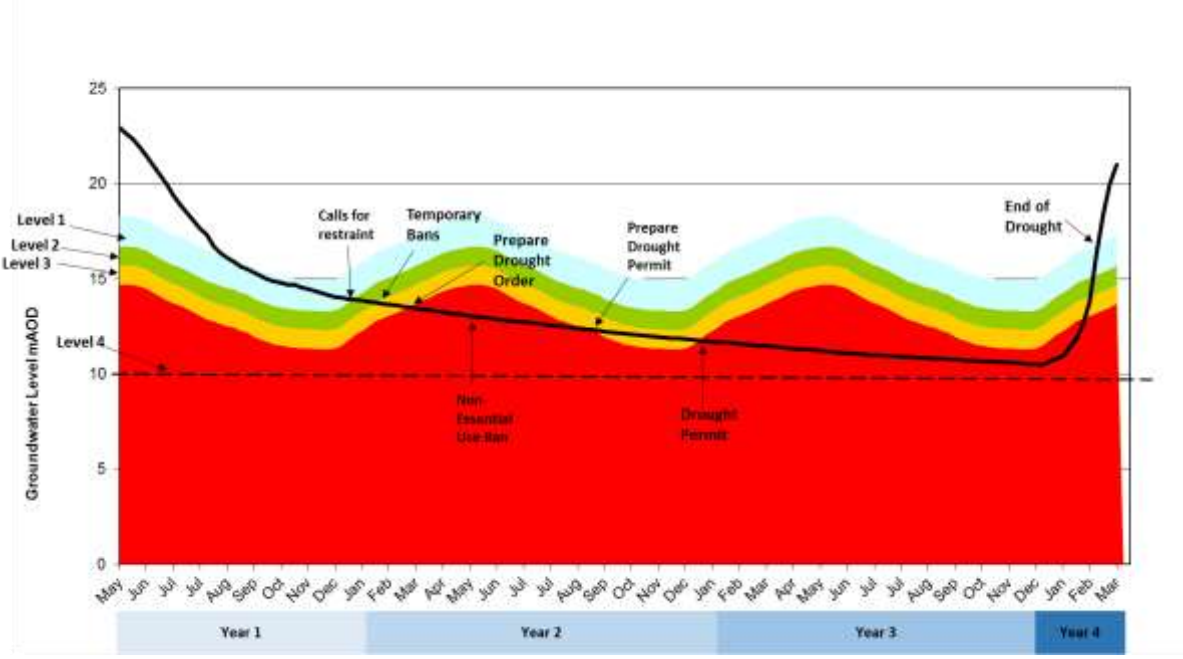

Figure 11: Scenario 'D' Drought

Under Scenario 'D' the first year is a bit wetter than Scenario 'C' but instead of recovering at the end of year two groundwater levels, and therefor deployable output, continue to fall in year three. This is defined as a 'Severe Drought' and recovery would only occur in year four with winter rainfall. In addition to 'Temporary Bans', which would need to be repeated, and a 'Non Essential Use Ban' imposed, this drought would require the 'Drought Permit' to reinforce

supplies. Ground water levels would drop to 10.5 m ADO and deployable output would be significantly constrained.

As outlined in Section 3.3, the Environment Agency has asked water companies to consider very rare three year droughts. Scenario 'D' is based on Scenario 'C' but with the groundwater recession extended into a third year with very low rainfall.

Portsmouth Water would already have been working closely with the Environment Agency and other stakeholders, during the first two years of the drought. By the spring of the third year, the Drought Management Team would be publicising the prospects of a third dry summer. This would involve the extension of the existing 'Temporary Bans' and the removal of some concessions.

By the end of May, the danger of rising demand would require the introduction of the 'Non Essential Use Ban'. This would impact on commercial customers such as window cleaners, gardeners and vehicle washers. Portsmouth Water assumes that the response to a 'Non-essential Use Ban' would be a further 5% reduction in demand.

With lower groundwater levels than ever recorded before, and lower yields, it might be necessary to apply for a Drought Permit for North Arundel. This would produce an additional 8.5 Ml/d of supply for the whole of year three.

As with previous scenarios it would be for the Drought Management Team to make the appropriate decisions as the drought develops. The possible phasing of drought measures in a Scenario 'D' drought is as follows:

Phase	Drought Measure	Timing
1	Appeals for restraint and enhanced leakage control	January (Year 2)
2	Imposition of a Temporary Ban	February (Year 2)
3	Non-essential Use Ban	May (Year 2)
4	Drought Permit	January (Year3)

Table 10: Scenario 'D' Drought Actions

This scenario is assumed to have a return period of around 1 in 200 years. With no historical data to base this drought on the source yields are highly uncertain. The table only represents an indication of what the Company might do under the influence of a 'Severe Drought'.

It would not be prudent to remove demand restrictions until groundwater levels rose above the 'Upper Trigger' at the beginning of year four.

4.4.10 *Application of Drought Management Actions*

The sequence of Drought Actions will be determined by the Company's Drought Management Team, but will be largely dictated by the severity of the drought situation together with the particular drought scenario being followed.

It must be recognised that the critical period for the Company to maintain supplies because of its lack of raw water storage, will be the peak demand months of May to August. These will be the prime periods for Company actions and they may only be required for relatively short durations.

On a monthly basis, the Company will assess the impacts of the theoretical scenarios in the following seasons and apply them to current groundwater levels in order to determine the need for possible actions. In the event that the Trigger Profile is breached, or likely to be breached during the following season, the Company's Drought Management Team will be convened in order to determine the necessary actions to be taken.

The actions will also be very dependent upon the lead-in time needed for development of the options which can vary due to numerous constraints.

4.4.11 *Assessment of Drought Management Actions*

It is anticipated that the Company is expected to rely upon a high profile campaign with measures applied consecutively if there is a likelihood of demand exceeding available supplies.

The Company anticipates that the Drought Management Team will assess the impact of each of its actions before applying further measures in order to ensure that a 'Supply/Demand Balance' is maintained throughout the peak period. An indicative smoothed demand curve is shown for each scenario with the impact of each measure notionally shown. Real fluctuations in demand will, however, be much more severe, but are not expected to exceed the smoothed demand curve shown.

When the Drought Management Team anticipates that the 'Supply/Demand Balance' is unlikely to be maintained by demand management actions, it is anticipated that a Drought Permit will be issued for the Source S Works.

In the event that a Drought Permit is required by the Company to increase the source yield, then environmental data will be collected to support the Company's applications.

5 THE ENVIRONMENTAL IMPACTS

By definition, droughts are extreme events and regardless of abstraction they will inevitably have an effect on the environment. Plants and animals, as well as humans, have adapted to cope with very dry conditions occurring from time to time. Nature has a remarkable resilience which enables it to recover from even the most extreme events. When nature is unable to recover, it will adapt to the new conditions to which it is exposed.

The Environment Agency and Portsmouth Water have a responsibility under the Water Resources Act and the Habitats Directive to minimise the impact upon habitats and species. However, during a 'natural' drought it may not be possible to protect every wetland or section of river from the impacts of low groundwater levels and low flows. Priorities must be established and possible monitoring and mitigation discussed with the Environment Agency, Natural England and other conservation bodies.

The various Habitats Directive sites relating to the Company's activities are shown in Section 2.

5.1 Monitoring Drought Impacts

In the autumn of 1973, groundwater levels fell to an all-time low. There was little winter recharge and the aquifer stayed below the normal level for over eighteen months. Under these conditions, chalk streams and wetlands dried out and plants and animals were put under stress for a considerable period of time. Portsmouth Water does not have any environmental impact assessments from this period and have not seen any published data. Whilst groundwater modelling can predict the impact upon groundwater levels and river flows it is probably not accurate enough to identify environmental impacts which may have occurred. It is therefore difficult to quantify the possible environmental impact of drought conditions in Portsmouth Water's area.

Portsmouth Water undertook major investigations into the impact of abstraction on river flows as part of the Water Framework Directive (WFD) and this provided valuable flow and ecological data.

Further work, using the East Hants and Chichester Chalk (EHCC) groundwater model, has allowed rarer drought scenarios to be simulated. This is particularly important for the scenarios where there is no recent history.

Portsmouth Water has implemented licence variations that protect flows into the harbours which are designated under the Habitats Regulations. Minimum Residual Flow (MRF) conditions and data collected for compliance will be useful for monitoring impacts. Portsmouth Water will

ensure that all other options are exhausted before drought permits are considered at these sites.

Climate change may increase the natural impact of droughts and it will also be necessary for the Environment Agency to monitor these effects. The potential effect of climate change is built into the Supply/Demand Balance in Water Resources Plans but the impact is not explicit in the short term Drought Plan.

It may not be possible or politically acceptable to always protect the environment during severe drought events. A balanced view will need to be taken which includes the statutory duty to supply water for public health.

5.2 Environmental Monitoring

To date, Portsmouth Water has not required Drought Orders or Permits. As a result, the Company has little experience in conducting the relevant environmental monitoring. It is likely that the Environment Agency will assist the Company in providing advice and sharing any relevant monitoring data with the Company, with the overall responsibility being on the Company to provide the adequate baseline monitoring information. This, along with collaborative work with Natural England, would be beneficial to the Company when applying for Drought Orders and Permits.

The Company has developed the requirements for such monitoring by dialogue with the Environment Agency, Natural England and Southern Water.

5.2.1 *North Arundel*

A Drought Permit for the North Arundel Source would increase the output from its current 2.5 Ml/d licence up to 11 Ml/d. When the second borehole at North Arundel was developed in 1990, the site was test pumped and sustained a long term yield of 11 Ml/d. The source was licensed at this figure in 1991, although it was subsequently reduced to 2.5 Ml/d due to its assumed impact on Swanbourne Lake, Arundel.

The Lake is an artificial feature and relies on groundwater flows to maintain its level. In a 'Severe Drought', even with the dredging carried out in 2002, the lake is expected to dry out. Prior to dredging Swanbourne Lake the Environment Agency set up a network of groundwater monitoring boreholes. Flow gauging was also carried out on the Black Rabbit Stream, Mill Stream and Park Bottom Stream. Environmental studies were carried out by the Environment Agency in 1995 and again in 2005.

Prior to completion of the dredging, Natural England classified the lake as 'unfavourable recovering'. The adjoining Mill Stream and Wetland and Wildlife Centre were classified as 'unfavourable declining'. The condition of the sites was last updated by Natural England in 2014 and Swanbourne Lake is now classified as "favourable" and the Mill Stream as "unfavourable recovering". The condition assessment for the lake now states that it is not a qualifying feature of the SSSI.

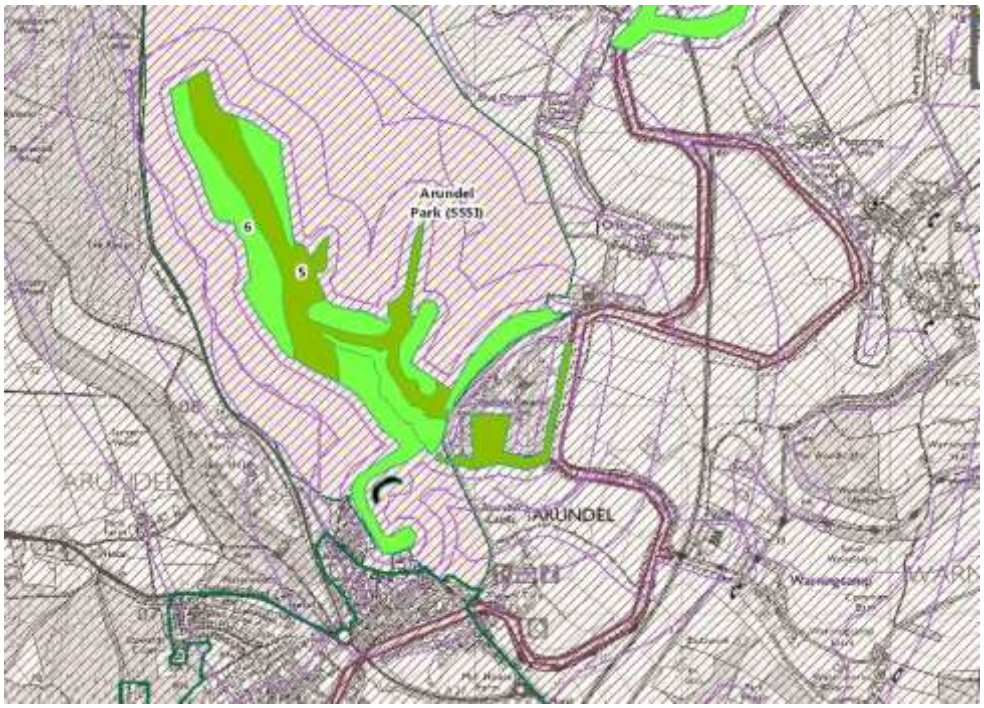

Figure 12: Swanbourne Lake (map sourced from Natural England web site)

It should be noted that Southern Water's North Arundel Source is also perceived to have an impact on Swanbourne Lake. Portsmouth Water has proposed joint studies with Southern Water to identify the Environmental Issues surrounding the water body. These studies are likely to include:

- Groundwater & Surface Hydrology
- Water Quality
- Biological Receptors
- Designated Habitats

The modelling and ecological work will determine if abstraction has no further impact on the qualifying features when Swanbourne Lake is dry. Southern Water has completed an Environmental Assessment for their North Arundel Source Drought Order and this is included in their Drought Plan 2018 (see Appendix L'). They have not carried out any additional groundwater modelling yet but Portsmouth Water will work with Southern Water and the

Environment Agency to refine the 'Environmental Assessment' so that it includes all the impacts and the most up to date modelling results.

There are concerns about the potential delay in recovery of Swanbourne Lake, the joint monitoring set out in Appendix 'J' will help to determine these requirements.

In addition to Swanbourne Lake there are several WFD Water Bodies in Portsmouth Water's area of supply that could be affected by abstraction at North Arundel.

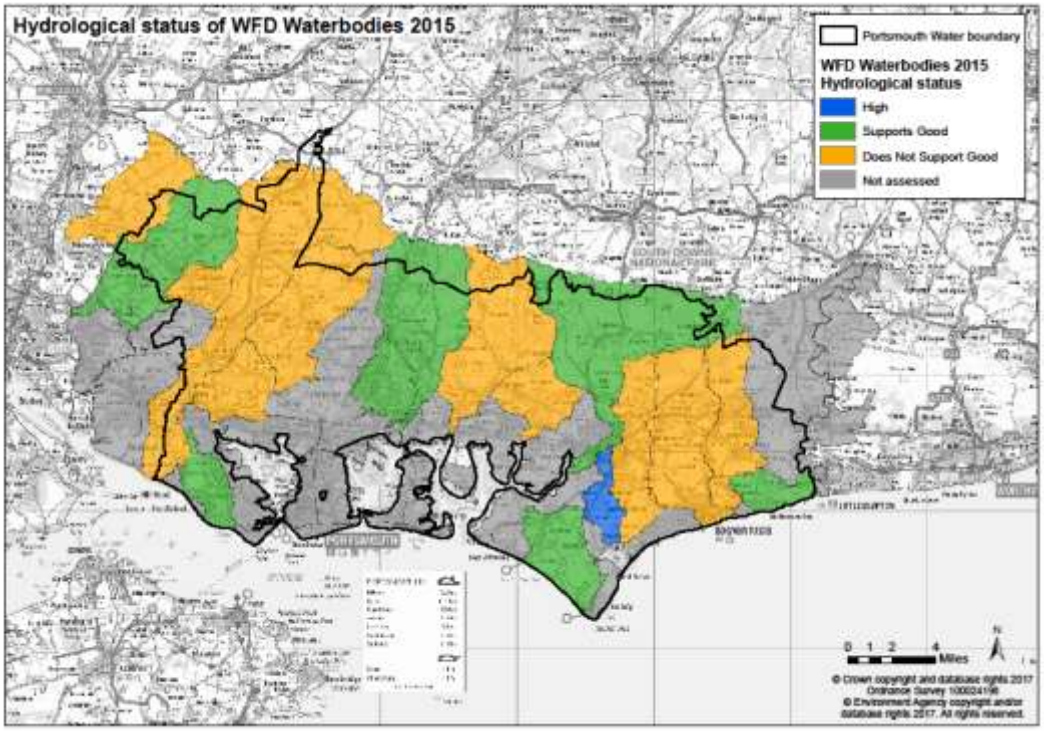

Figure 13: Hydrological Status of WFD Waterbodies 2015

Number	WFD Water Body
1	River Lavant
2	Pagham Rife
3	Aldingbourne Rife
4	Lidsey Rife
5	Binstead Rife
6	Ryebank Rife

Table 11: WFD Water Bodies

Figure 13 and Table 11 identify the water bodies which could potentially be affected by a drought permit at North Arundel. The status of these bodies varies but the ones between North Arundel and Swanbourne are in moderate condition. (Aldingbourne Rife, Lidsey Rife and Binstead Rife). On the information available to Portsmouth Water, a drought permit at North Arundel is unlikely to cause deterioration in status of these water bodies. Portsmouth Water are committed to working with Southern Water with regards to potential impacts caused by both Drought Permits and will produce a plan to include measures needed to mitigate any potential environmental damage.

Since the last Drought Plan was produced some of the catchments have been re-classified and are no longer considered to be WFD water bodies. In particular Park Bottom is not included in WFD assessments.

5.2.2 *Assessment of environmental impacts*

Portsmouth Water's area of supply includes a significant number of protected sites. The Company took into account the potential impact on protected sites when choosing which of the potential drought management options would be implemented. This information is based on evidence collected through numerous environmental studies carried out on designated sites.

Portsmouth Water has undertaken analysis to demonstrate that even in the most severe drought scenario, the Company only requires a single drought permit to maintain their supplies to customers. The Source S Licence was chosen as it has the least likely impact upon the environment and is the only drought permit proposed.

As the proposed drought management options do not impact designated sites, a HRA is not required. An SEA is also not required as the plan is operational and sets out potential temporary options to manage a drought. The Company has not carried out any detailed studies of the other potential drought permit options as they are not regarded as feasible options.

A screening exercise was undertaken by the Company to comply with Habitats Directive to inform the selection of drought management options and showed the North Arundel is least likely to cause environmental impacts; this is mentioned in section 4.4.6 and the screening table found in Appendix 'G'.

The potential impacts of drought permits on the environment can vary throughout the year. The critical period for the environment tends to be the autumn during the lowest groundwater levels. This has been considered when developing drought management options. Environmental monitoring information will be found in Appendix 'J'.

6 MANAGEMENT AND COMMUNICATION STRATEGY

Communication will play a key part in any Drought Management Actions and will involve the Company, customers and the regulators. It will not be possible, or even desirable, to work to a fixed communication strategy since the plan will need to be tailored to the circumstances of that particular drought situation.

It is anticipated that if drought monitoring projects a future breach of a Drought Trigger, surrounding companies might also be in a similar situation and that co-ordinated activity by both companies and the Environment Agency will be needed. In addition, the Company anticipates developing stronger links with the Consumer Council for Water, Local Authorities and other public organisations in order to maximise the impact of its drought management actions.

The communication strategy includes liaising with other water companies to develop a coordinated set of actions, including actions on temporary bans. It is important to measure the effectiveness of the communication strategy, however this will depend on what the communication plan is as the exact details are only determined during a drought. Nonetheless, the success of the communication strategy will need to be monitored to ensure it is effective.

6.1 Drought Co-ordination with Natural England, the Environment Agency and Water Companies

After the initial convening of the Drought Management Team, the Company's communications representative will make contact with Natural England and the Environment Agency, Local Authorities such as West Sussex County Council (WSCC) and the surrounding water companies, in order to develop a co-ordinated communications strategy.

Key to the success of the communications strategy will be regular interaction with Water Resources in the South East communications group to coordinate messages and to discuss the potential implementation of restrictions

The Company anticipates that there will be an element of Company-specific publicity/media coverage as well as that which will be promoted in a collaborative campaign with the water companies and the Environment Agency.

6.1.1 *Regional Drought Data*

The Company receives monthly data from the Environment Agency relating to rainfall, river flows and groundwater levels. The Company anticipates that this information will continue to

be supplied during a drought and that a Regional Situation Report will also be produced on a monthly basis.

The Company will contribute its Havant rainfall and Well X data at the request of the Agency and/or other water companies.

6.1.2 *Regional Drought Co-ordination*

The Company anticipates that it will become involved with the Environment Agency's Regional Drought Co-ordination Group and that a member of the Drought Management Team will act as the Company's representative.

The Company will share its data and proposed actions within that Group and, where possible, share resources.

Actions and data shared will cover all aspects of drought communication, including a decision on when the drought is over, including liaison with the EA to make this decision.

A post drought review will be undertaken, when the drought is over, to determine how droughts will be managed in the future and any changes should be made to future drought plans. This review will include the Environment Agency and other Water Companies. The potential steps in this process are as follows:

- One month after the end of the drought – Appoint a post drought review author and hold internal workshops to collate information and views.
- Two months after the end of the drought – Meet the Environment Agency and other Water Companies to discuss lessons learnt.
- Three months after the end of the drought – Publish the Post Drought Review.
- Beyond three months – continue to collect environmental data and consider updating the WRMP and Drought Plan.

6.1.3 *Regional Drought Communications*

Given the importance of communications, the Company anticipates that a member of the Drought Management Team will also be nominated as the Company's representative to join the Environment Agency's Regional Communications Group.

6.2 Key Public Messages

The messages used and the method of delivery will be dependent upon the severity of the developing situation as well as the resources available to the Company to deliver its messages. Where there are joint opportunities to deliver messages then the Company will maximise their use.

Throughout the campaign the Company would develop information messages setting out:

- The key reasons for the current water resource situation
- The actions taken by the company to date
- The concessions available
- The potential for future actions if the situation worsens
- The contact point for further advice
- The actions customers can undertake to help
- Regular briefings will be made available to the media, stakeholders and customers by use of the Company website.

6.2.1 *Promotion of Water Efficiency*

As a potential drought situation developed with low rainfall, falling groundwater and spring yields, Portsmouth Water anticipates extra promotion of the water efficiency message.

Delivery of the message might be through:

- Regular Press Releases to Local Press and Radio
- Regular Stakeholder Briefing Sheets to the:
- Environment Agency
- Natural England
- Local Authorities
- Consumer Council for Water
- Members of Parliament
- Trade Associations
- OFWAT
- Website messages
- Social media tools
- E-mail postscripts
- Van-side messages
- Briefing Notes for Customer Services and Distribution staff

6.2.2 *Appeals for Voluntary Restraint*

As a follow on from water efficiency promotion, stronger appeals for water conservation would be encouraged. As with the promotion of water efficiency measures, a similar delivery vehicle would be used:

- Regular Press Releases to Local Press and Radio
- Regular Stakeholder Briefing Sheets to the Environment Agency/Local Authority/Consumer Council for Water/Members of Parliament/Trade Associations
- Website messages
- E-mail
- Van-side messages
- Briefing Notes for Customer Services and Distribution staff

In addition, the Company might seek to place posters in public buildings, doctors' surgeries, etc.

6.2.3 *Enhanced Leakage Control*

In the event that enhanced leakage control would be needed, the Company anticipates that it will ask customers to aid its efforts to reduce leakage levels by promptly reporting leaks. The same methods of delivery message as those above are likely. Where pressure reduction is deemed necessary, the Company would again use similar delivery messages to those outlined above for advising customers that network pressure reductions are to be implemented. The Company anticipates that such measures will be published prior to their implementation.

6.2.4 *Temporary Ban*

When a 'Temporary Ban' is thought to be enacted and the Company will follow the statutory notice requirements. Portsmouth Water will also use the 'Code of Practice and Guidance on Water Use Restrictions' published by the Water Industry. The initial notice is likely to be given in April for a Scenario 'A' Drought and in January for a Scenario 'B', 'C' and 'D'. Portsmouth Water has allowed four weeks for representations. However the consultation on the Draft Drought Plan has already provided an opportunity for interested parties to make representations on the proposed restrictions. Any representations received by the Company at the time of implementation of the 'Temporary Bans' will be duly considered by the Company.

It is anticipated that in the initial period following the publication it might be necessary to extend the opening hours of its Customer Service telephone lines to deal with customer enquiries. Detailed briefings for staff would be prepared outlining the details of the application of the ban.

The legislation requires the notice to be published in at least two newspapers circulating in the area and on the Company website. In addition Portsmouth Water would issue a Press Release and use local radio, television and newspapers to explain the need for the ban and the details of its implementation.

Representations to the 'Temporary Ban' are outlined in section 4.2.2, to reiterate, any representations made on temporary restrictions will be recorded and the exact method of response will depend on the number and nature of representations that are made.

6.2.5 *Drought Orders (Non Essential Use Bans)*

Under the current legislation most restrictions on commercial water use are covered by the Drought Direction 2016. The Company would still require an application to the Secretary of State for a Drought Order and it is possible that a public inquiry might be required in advance of its granting. In the event that there is likelihood that the other measures are unlikely to enable the Company to balance demands with the available supplies, the Company would advertise its intention to apply for such a Drought Order in the local press. In addition, it will utilise:

- Press Releases to Local Press, Radio and TV
- Stakeholder Briefing Sheets
- Website Messages

Following the granting of the Order, the Company would then implement designated actions principally by Public Notice and Press Release. Where there are selected commercial users which are likely to be affected, the Company would communicate with these organisations and/or their trade associations directly.

6.2.6 *Compensation*

Water companies normally have a duty to provide a constant supply of water that is sufficient for domestic purposes. However, if there is (or if there is a danger of) a serious supply shortage because of exceptionally low rainfall, then a drought order may be sanctioned by the Secretary of State for Environment, Food and Rural Affairs. A drought order can change a water company's water supply obligations including quantity pressure and the means of supply.

There is a statutory duty for Water Companies to compensate owners of other sources of water when drought orders are in force but no duty to compensate it's own customers. Therefore, commercial users who are dependent on mains water supplies for their business operations should consider taking steps to protect themselves from the effects of water use restrictions which are imposed under drought measures. It may be that a number of businesses need to

consider pooling resources and if possible accessing alternative supplies from, say, an area outside that affected by drought.

The Company does not envisage the need to make compensation payments to customers as a result of the implementation of any drought measure. The imposition of restrictions is likely to be the result of a natural event outside the Company's control.

6.3 Supply Side Options

Supply side options, such as commissioning unused sources, could be used in a drought but they are not considered to be feasible options in the WRMP. The Company anticipates that communication with environmental groups and other licence holders would be undertaken in advance of the Company's formal application for a Drought Order or Permit.

6.4 Interconnection of Water Supplies

The Company notes that due to improved connectivity between various sources, the Company now has a single water resource zone. This improvement provides greater operational flexibility increasing the ability of the Company to maintain supply in the event of a loss of a supply site. The amount of detail relating to individual sources that is placed in the public domain is restricted on grounds of national security.

6.5 Emergency Plan

Portsmouth Water's Emergency Plan is principally designed to handle short-term extreme events. Planning to maintain water supplies in an emergency and the actions necessary are detailed in the Emergency Plans which due to national security reasons cannot be in the public domain but are easily accessible to the Company should such an issue arise.

The key principles incorporated in the Emergency Plan would be utilised for managing the most severe actions outlined in this Drought Plan. The guidance for preparing the Drought Plan states that the drought management actions should include "Emergency Drought Orders". For Portsmouth Water, Emergency Drought Orders are only likely to be required for the most extreme events (greater than 1 in 200 year return period). They are most likely to be used as part of an emergency plan when a drought is combined with a pollution incident of the loss of a large works.

During an emergency it may be necessary to override any environmental constraints on abstraction licences. These could be "Minimum Residual Flows" (MRF) in rivers or restrictions on the volume of water pumped over a given time period.