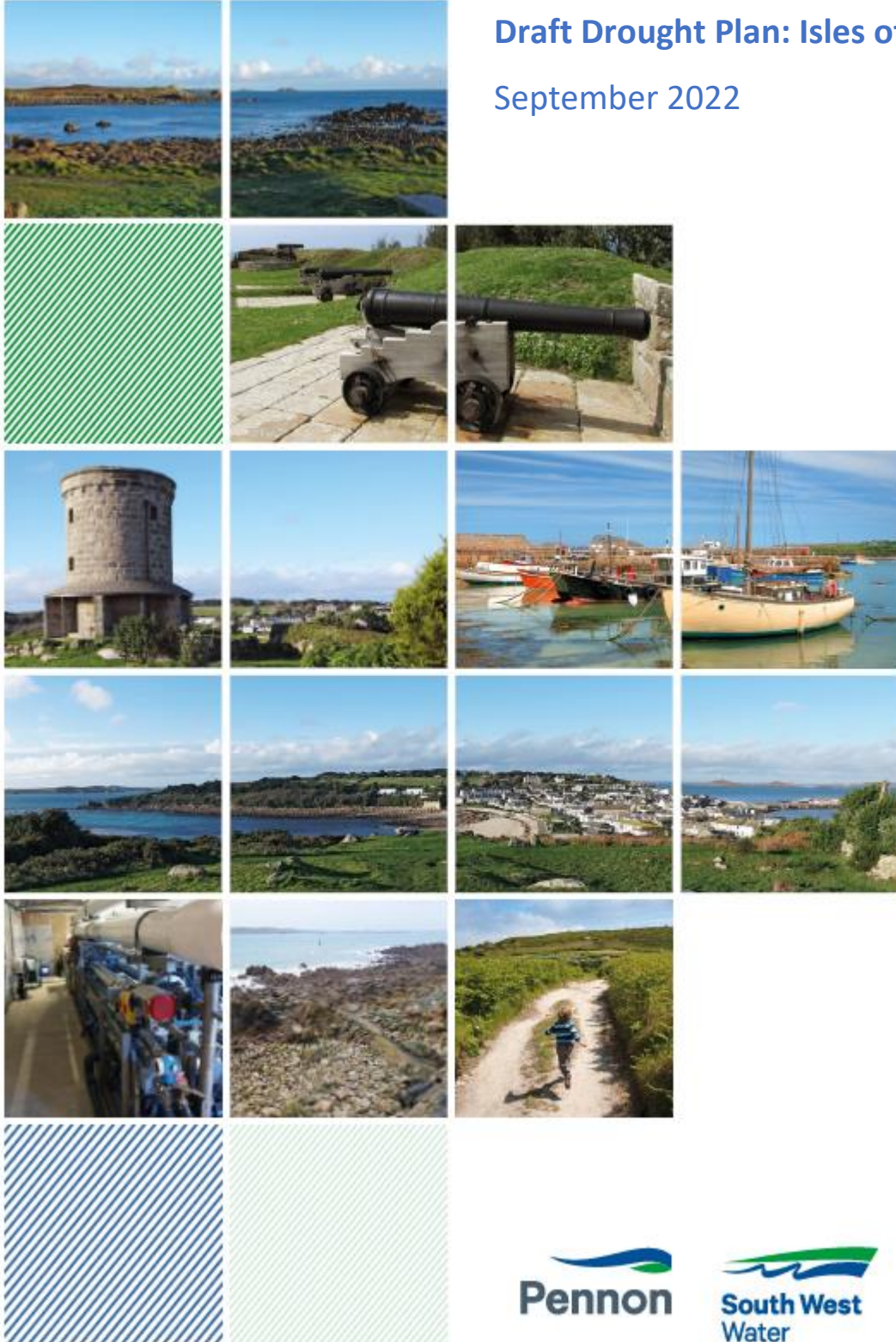


Draft Drought Plan: Isles of Scilly

September 2022



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1.0 Introduction

The Isles of Scilly have been included as a separate section of our Drought Plan as the islands are geographically remote with no connection to our mainland water supply systems. Their unique setting requires a different approach to that traditionally used in water resources planning. We have developed a tactical draft plan that sets out how we will manage drought events for the communities on the islands.

It follows the Drought Plan guidelines and structure set out by the Environment Agency and used in the main plan (Main Drought Plan, Section 1). However, the nature of the hydrology of the islands is very different from the mainland in terms of both water availability and vulnerability to drought. They are five different, separate and distinct water supply systems.

It is the first time that a drought planning approach has been applied to the Isles of Scilly. In recognition of this, as well as considering the water resources of the islands overall, this draft plan also sets out our approach to each separate island as our understanding improves in the coming years.

We expect to develop and evolve our drought planning over the next five years recognising the impact of the planned investment and environmental studies currently being implemented. We therefore intend to revise this draft Isles of Scilly Drought Plan Appendix to the main Drought Plan and publish a final updated version in December 2024.

Background on the Isles of Scilly

As of 1st April 2020, South West Water (SWW) assumed responsibility for public water supply and waste treatment on the Isles of Scilly (IoS), taking on the established sources and small networks on the five inhabited islands. Prior to 1st April 2020 these were operated by the Council of the Isles of Scilly (St Mary's and Bryher), The Duchy of Cornwall (St Martins and St Agnes) and Tresco Estates (Tresco). The islands are shown in Figure 1.

Figure 1: Map of the Isles of Scilly



Natural freshwater sources of supply are restricted due to the nature of the geological formations underlying the islands which have a relatively low capacity to store water. Water resources on the islands comes predominantly from groundwater sources, mainly located within fractured granite and overlying 'Head' deposits. On St Mary's, however, approximately 40-50% of total water into supply comes from the desalination of seawater, abstracted from coastal boreholes and, in the summer months, from a seasonal sea water intake.

A large raw water storage reservoir is not viable, primarily due to the size of the islands and the underlying geology. The result is the islands are vulnerable to drought [see Section 2]. The company therefore continues to look at how we could develop additional storage on each island which would be of material benefit. Viable storage options and supporting information will be presented in the revised version of the final plan to be published in December 2024.

In addition, each of the islands is vulnerable to water quality issues to varying degrees. Risks include high nitrates from horticultural/agricultural sources, naturally occurring radon, treated/untreated effluent contamination from private sources, as well as the risk of high salinity, either from wind-blown sea spray and/or saline intrusion.

In developing this draft Drought Plan we have looked to build in this additional risk to supplies.

2.0 Drought Planning

The structure of this document follows that of the main body of our Drought Plan with sections setting out the draft drought plans for each island. For each island we set out:

- Background
- Drought Vulnerability Assessment
- Drought Triggers
- Drought Actions
- Extreme Drought Measures
- Management and Community Communication
- Coming out of a Drought
- Environment assessments
- End of Drought

Whilst the detail of how we will manage a drought differs for each island, they all follow the same drought and demand trigger levels used to manage the response. These are below and follow the national EA guidelines. The drought naming used is:

- Level 0 – Normal operation
- Level 1 – Prolonged dry weather
- Level 2 – Drought (Temporary Use Bans)
- Level 3 – Severe Drought (Non-essential Use Bans)
- Level 4 – Extreme Drought (Rota cuts)

2.1 General approach

Each of the five inhabited islands can be considered differently, having their own separate water supply systems, water resources risks and community requirements.

We have derived a series of drought triggers based on a combination of groundwater levels and demand severity, as well as considering meteorological conditions such as rainfall and temperature. The triggers are used to identify different severities of drought (Levels 1 to 4) following the approach outlined in the Environment Agency guidelines.

We will use these drought triggers to identify when we should consider implementing specific drought actions to reduce demand and, if necessary, to obtain extra water resources.

The range of available drought options on each island is relatively limited. Therefore, to be effective, our draft plan also considers the islands as a whole and includes the potential transfer of water from one island to another, particularly in more severe or extreme droughts.

We manage our mainland water resources on a Water Resource Zone basis, with each zone comprising a series of water supply sub-zones which support each other during a drought. We have developed a similar approach for the islands.

Our initial response for an island entering into a drought will consider options available to that specific island. As a drought deepens our planning may involve calling on support from

neighbouring islands where spare water is available. This approach will allow us to optimise the limited water resources available across the whole of the Isles of Scilly.

It is our intention to undertake a drought exercise, to test current assumptions, assess the likely success of proposed drought measures and inform the update to the IoS Appendix in 2024.

Data Availability

Data availability is important in the development of a Drought Plan. We currently have limited data on the long-term performance of the water sources of the islands from both a water resource and water quality perspective.

Furthermore, prior to SWW taking on responsibility for water supply and waste in April 2020 the Isles of Scilly were unregulated and therefore subject to different requirements to those on the mainland. They did not for example have formal abstraction licences. Abstraction licences were subsequently granted in October 2021. The conditions attached to the licence will be important in informing the future management of water resources on the islands.

Considering the issues, we have developed this draft plan using the available data records as well as our experience of the prolonged dry weather event of 2018. Local knowledge and experience have also played an important role. The 2018 event gave practical experience of extended dry weather conditions on the islands and considered a good benchmark for developing our management response.

Currently there is limited hydrological data for the islands other than St Mary's. Over the next two years we will be developing a hydrological monitoring network for each island, increasing both the coverage (i.e. number of sites) and the frequency of data collection, to improve understanding and provide greater confidence in future decision making. This will be particularly important for long term planning, including future drought planning.

Water resource data limitations and actions proposed in the monitoring plan are provided in the table below:

<i>Data type:</i>	<i>Historical data constraints:</i>	<i>Action proposed in IoS Monitoring Plan:</i>
Groundwater	Historical groundwater levels limited to manual dips generally taken every two weeks at abstraction wells. No coincidental record of pumping impact / abstraction rate. Recent shallow piezometer data available for Lower Moors SSSI monitoring network.	Installation of continuous telemetered monitoring network including abstraction wells/boreholes and new observation boreholes in each catchment containing sources of supply. Integration with Lower Moors monitoring network to be agreed.
Surface water	Historical surface water levels limited to Lower Moors SSSI monitoring network.	Installation of continuous telemetered monitoring network on surface water features in each catchment containing sources of supply.
Abstraction rate	Historical abstraction rates limited to weekly/fortnightly totaliser reading.	Installation of continuous telemetered abstraction monitoring network including abstraction wells/boreholes.
Water quality	DWI and EA WQ sampling data plus limited abstraction source data from previous operators on each island.	Establishment of a regular routine water quality sampling programme at sources and installation of continuous telemetered temperature and

		conductivity monitoring network at some observation wells (tbc).
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Until additional hydrological data become available, it is not possible to develop individual environmental triggers for islands other than St Mary’s. We will therefore use St Mary’s environmental data to assess the severity of drought across all the islands. In addition, the local demand stress on each island will inform the response to a developing drought.

Timeline and activities for updated IoS Appendix

An update to the IoS Appendix to the main Drought Plan will be produced in 2024 taking account of additional data, information and analysis resulting from:

- i) the implementation of the monitoring plan,
- ii) ongoing engagement with key stakeholders,
- iii) an additional two years of SWW operational experience.

The timeline of key activities required for the submission of the updated IoS Appendix in December 2024 is provided in Table 1.

Table 1: Timeline to submission of updated IoS Appendix in 2024

Element:	2022				2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Monitoring plan agreed with EA, NE & IoS WT		◆										
Implementation of monitoring plan for all five islands										◆		
Drought monitoring review and liaison with EA, NE and IoS WT												
Data collection & processing												
Analysis and review of data and information												
Development & refinement of conceptual groundwater models												
Derivation of island specific drought trigger levels												
Review requirement for Drought Permits / Orders												
Production of draft IoS Appendix for Drought Plan											◆	
Consultation on draft IoS Appendix for Drought Plan												◆
Production of final IoS Appendix for Drought Plan												
Submission of IoS Appendix for Drought Plan												◆

Notes:

i) Q1=Jan-Mar, Q2=Apr-Jun, Q3=Jul-Sep, Q4=Oct-Dec.

ii) Primary activity in darker blue, preliminary/ongoing activity in lighter blue.

3.0 St Mary's

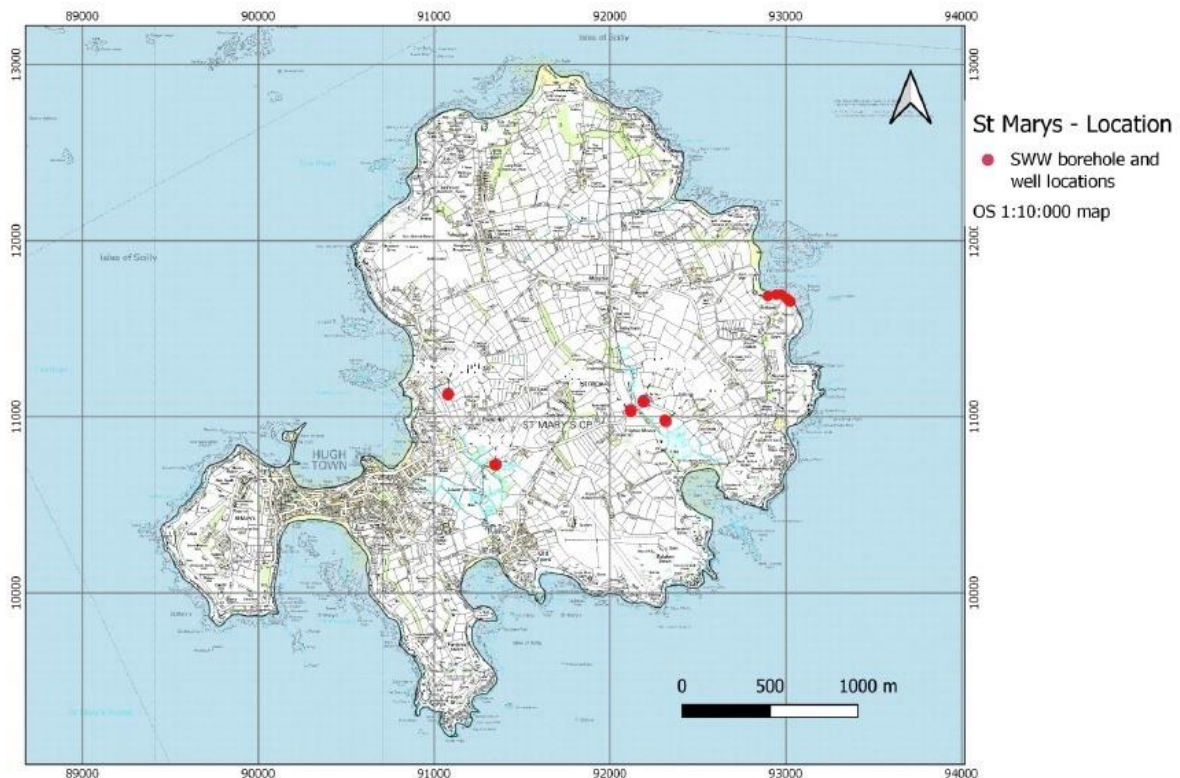
3.1 St Mary's Draft Drought Plan

3.1.1 Background

St Mary's is the largest island with the highest population (2,153 residents in 2011) and greatest demand for water. The current water supplies are obtained from a combination of groundwater sources (four boreholes / wells) fed from two distinct catchment areas, plus desalinated water from a series of coastal boreholes and a seasonal direct seawater intake. The groundwater sources on St Mary's are located adjacent to/within two environmentally designated areas; the Higher and Lower Moors wetlands, which have SSSI status. The seawater abstraction is pumped to the desalination plant where it is treated by a process of reverse osmosis (RO). Blending of the groundwater and desalinated seawater takes place to achieve acceptable water quality.

The groundwater supply on St Mary's comes from two large diameter wells (Venns and Joaneys) and two boreholes (Hales and Rocky Hill). Venns Well and Hales borehole lie within the Higher Moors groundwater catchment, while the other sources lie in the Lower Moors area, west of the island. The location of these sources is shown in Figure 2. In addition, saline groundwater abstraction occurs from seven boreholes located on the clifftop overlooking Pelistry Bay on the east of the island. The saline water provides a feed source to the desalination plant at Mount Todden.

Figure 2: Location of St Mary's groundwater supply sources.



3.1.2 Drought Vulnerability

We have completed a provisional drought vulnerability assessment for the islands. This is provided in Appendix A. We have classified as **HIGH VULNERABILITY**. The key reasons for this are:

- The small surplus of supply capacity over demand in the summer months.
 - The limited storage in the main aquifer system and its reliance on regular recharge events.
 - No interconnectivity between the islands.
 - Lack of long-term source performance data.
 - Lack of support available from alternative, essentially mainland sources of supply
- Islands are classified as “Serious” under recent reclassification of water stressed regions in the UK.

3.1.3 Drought triggers

In this Section we set out the triggers that we will use to manage water resources in a drought and how we have tested them against the prolonged dry period and high demands of 2018 and a more severe event similar to the summer of 1976.

We have derived a series of drought triggers based on a combination of groundwater levels and demand severity, as well as considering meteorological conditions e.g. rainfall and temperature. The triggers are used to identify different severities of drought (levels 1 to 4) following the approach outlined in the EA guidelines.

We will use these drought triggers to identify when we should consider implementing specific drought actions to reduce demand and, if necessary, to obtain extra water resources.

It should be noted that the reaching of an individual drought trigger is a warning and does not by itself automatically lead to the implementation of specific drought actions. Groundwater and demand drought triggers are assessed in combination with due consideration given to meteorological forecasts as well as local operator knowledge/experience and in consultation with the Environment Agency and other stakeholders.

The existing drought triggers will be reviewed and any revisions included in the updated Drought Plan in December 2024. The revisions will be based on any additional data and information that can be obtained, including that provided by the proposed monitoring programme.

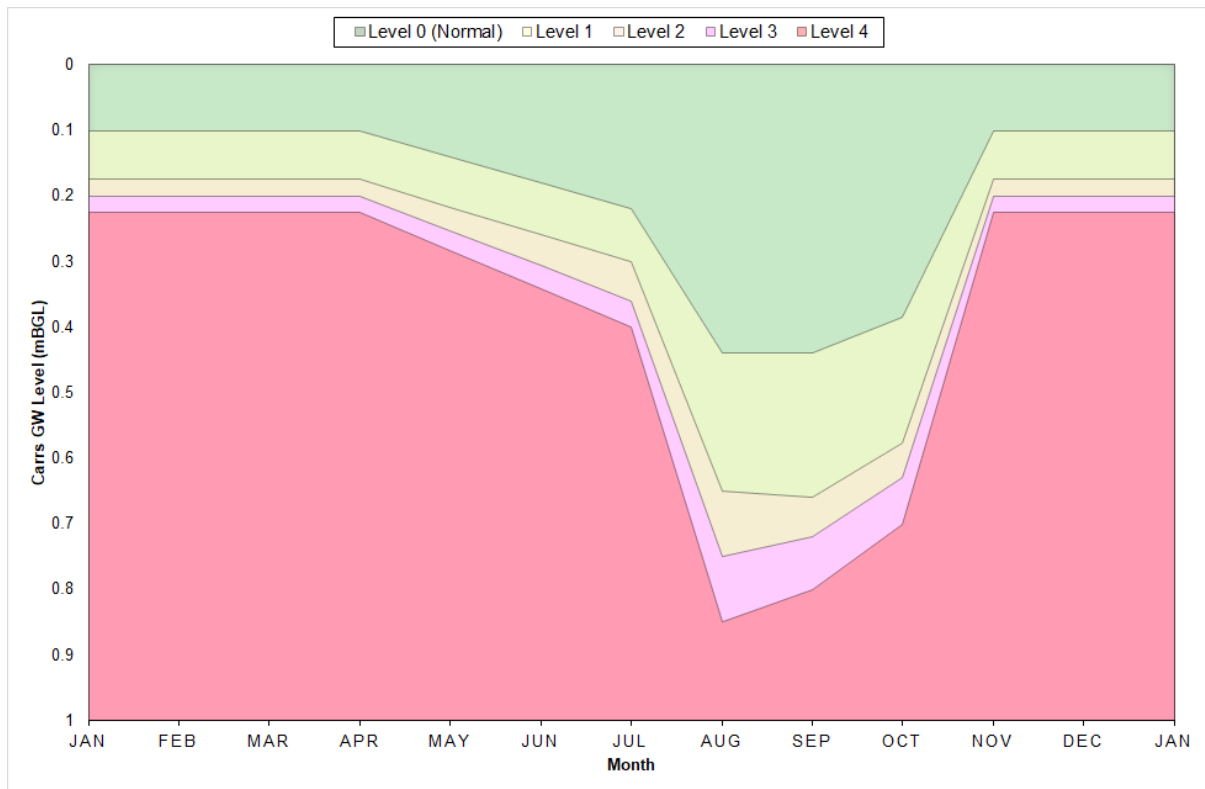
3.1.3.1 St Mary’s drought triggers

The drought triggers for St Mary’s utilise a combination of groundwater level stress curves and demand curves as detailed in Figure’s 3 & 4 below.

3.1.3.2 Groundwater triggers

The St Mary’s drought trigger assessment is based on groundwater levels in Carrs Well, which is located adjacent to the Higher Moors wetland area. The drought curves identify different drought severities.

Figure 3: St Mary's environmental trigger curve



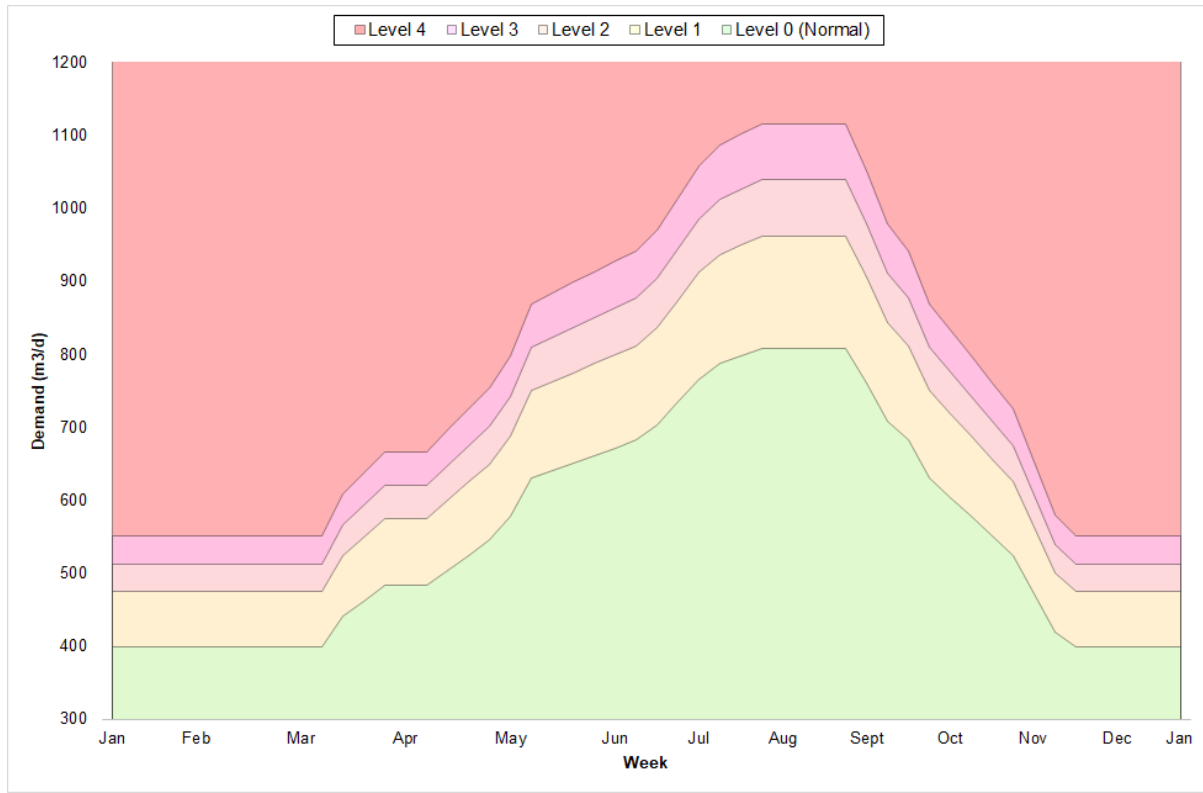
The Carrs Well groundwater level records, from which the St Mary's drought trigger curves are derived, are based on three years of continuous data from June 2018 and includes the impacts of the extended dry period experienced during Summer 2018. Records prior to this are in the form of manual dip readings and may be affected by abstraction from Carrs Well. The use of groundwater data from Carrs Well, which was not pumped during the period used for analysis is considered to provide a relatively robust initial assessment of the impact of abstraction in the catchment on the environment, given the limited data currently available.

We intend to undertake additional analysis of the trigger curves following further data collation and using the data outputs from the monitoring programme to be implemented by 31st March 2024. The additional data will be used to review the existing trigger curves and develop triggers for appropriately located groundwater observation boreholes, which will be installed as part of the monitoring programme. The outputs and conclusions of these investigations will inform the approach taken in the updated Drought Plan, to be published in December 2024.

3.1.3.3 Demand triggers

The demand triggers have been derived using the recently available demand data (2014-present) for St Mary's with particular focus on annual demand profiles and key periods of high demand. These are highlighted on Figure 4 and include the annual Gig Boat Racing Championships, August Bank Holiday and October Half term.

Figure 4: St Mary's demand trigger curve



3.1.3.4 Additional environmental drought triggers

In addition to groundwater and demand levels, other criteria will be considered in assessing the drought severity level, such as rainfall and stream flow. These will be used to inform our response as a drought develops and the actions that we may wish to put in place.

These are listed for St Mary's in the technical appendix (Appendix B).

3.1.3.5 Testing our drought triggers

We tested our drought triggers against the 2018 dry weather event to check their appropriateness for an event for which we have data and recent operational experience.

During the 2018 event groundwater levels reached the Level 1 Trigger threshold as shown in Figure 5 below, whilst demands reached around 600 m³/d in the first week of May. An enhanced communications campaign was eventually implemented throughout July and August which saw repeated, increasingly strongly worded media messaging. The media campaign was effective in constraining demand (see Figure 6) leading to a plateauing in demand in late July/early August. This was then followed by a change to wetter weather in mid-August. These factors prevented the event from passing the Level 2 Trigger threshold. If these measures were not in place, had not been effective, or if the weather had not turned cooler/wetter in mid-August, then it is possible/likely that demands would have reached the Level 2 trigger threshold. There also remains significant uncertainty around the granularity of seasonal demands and the impact of drought mitigation measures on the islands due to a

lack of detailed data/information. We are confident that our overall approach and the triggers are appropriate for this current version of the Drought Plan.

Figure 5: St Mary's Drought curve - 2018 event

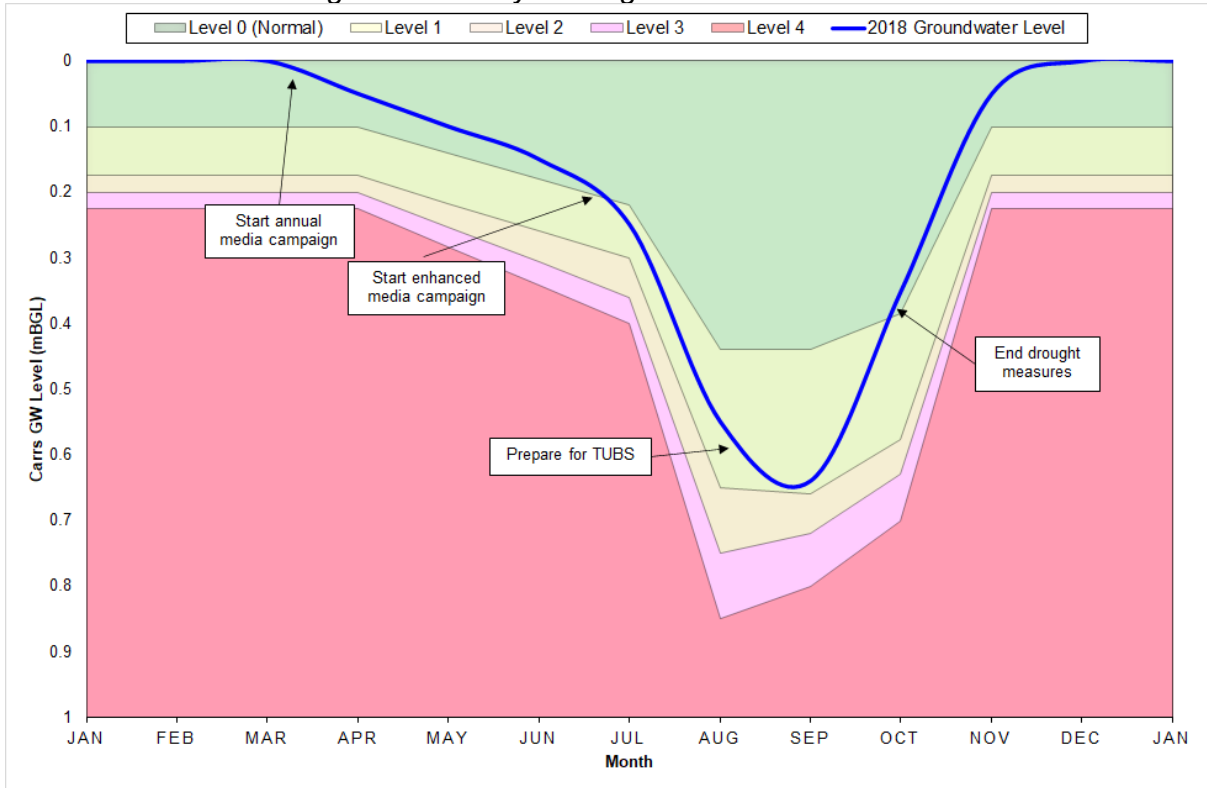
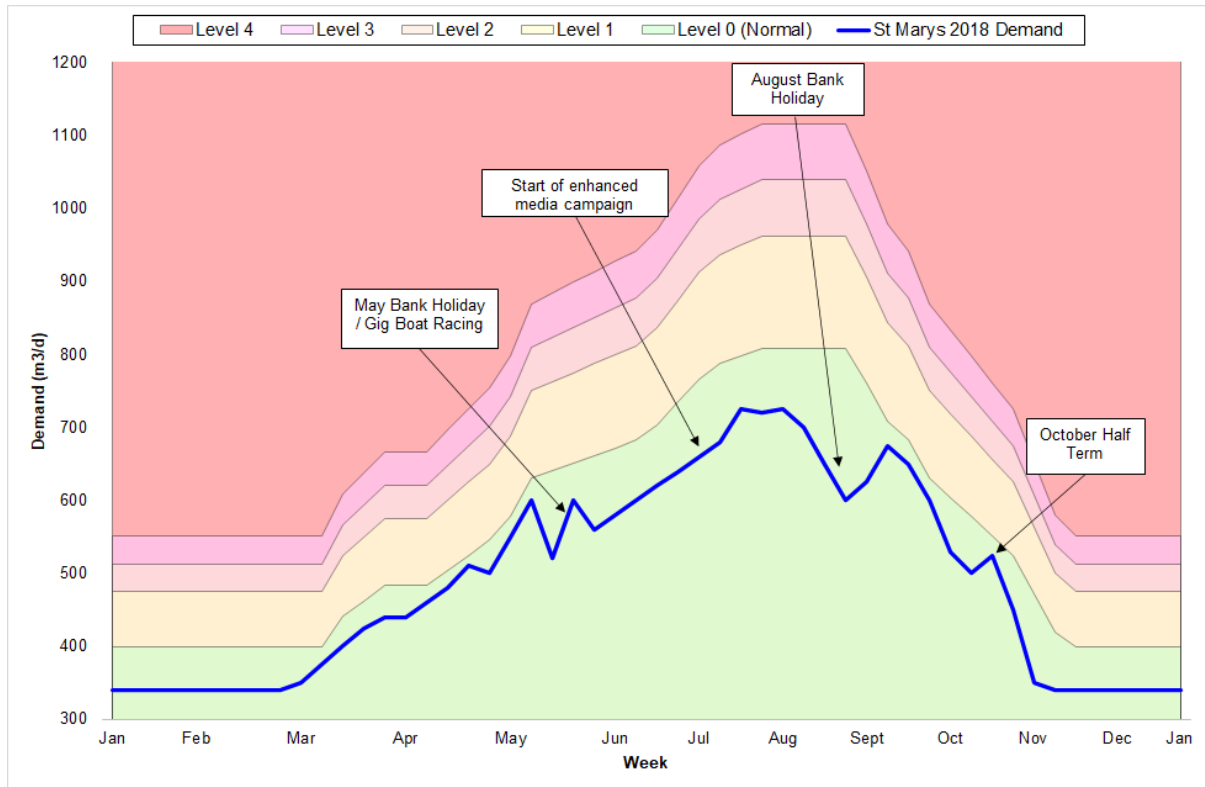


Figure 6: St Mary's Demand curve - 2018 event.



Full details of the 2018 timeline are given in the St Mary's Technical Appendix B. A more severe event is also tested to validate the Drought Triggers.

3.1.4 Drought actions

Table 2 below provides a summary of possible drought actions we may adopt as drought severity increases. Demand actions will be implemented ahead of supply actions at the same drought level whenever appropriate to do so.

As a Drought develops we would look to work with the Environment Agency, local community and the Council of the Isles of Scilly to adapt the options taking account of local knowledge and the need to achieve the least impact on the community and the environment.

Table 2: Isles of Scilly St Mary's drought action summary

Severity of the drought	Drought Severity Level	Demand side actions	Supply side actions
Normal operating	Level 0	Annual media campaign (see comms plan)	
Drought Operation – prolonged dry weather	Level 1	<ul style="list-style-type: none"> Discussion with large commercial customer re timing of highest water use to avoid peak demand periods. Community Drought Liaison Officer (Enhanced media campaign Phase 1). <p>Preparation 4 weeks before Level 1, plus 1 week for implementation.</p> <ul style="list-style-type: none"> Increased leakage control. <p>Implementation approx. 4 to 8 weeks</p> <ul style="list-style-type: none"> Enhanced pressure management. <p>Implementation approx. 1 to 4 weeks</p>	<p>Drought actions with minor environmental impacts:</p> <ul style="list-style-type: none"> optimising sources including desalination plant (max. 400-450 m3/d). outage minimisation
Drought Operation - drought	Level 2	<ul style="list-style-type: none"> Temporary use bans. <p>Advertising time and period for representations (see Section 3.3.1 of main Drought Plan)</p> <p>Typically, the preparation would start 4-6 weeks prior to implementation.</p> <p>Advertised 1 week before implementation.</p> <ul style="list-style-type: none"> Community Drought Support officer (Enhanced media campaign Phase 2). 	<p>Drought actions with minor environmental impacts:</p> <ul style="list-style-type: none"> 'Tankering' – provision of bowzers to strategic locations on the islands to support/supplement existing network e.g. to overcome constraints in the current distribution network. Increase storage capacity with temp storage tanks/reservoirs (above ground).
	Level 3	<ul style="list-style-type: none"> Non-essential use bans <p>Advertising time and period for representations</p> <p>Typically, the preparation would start 4-6 weeks prior to implementation.</p> <p>Advertised 1 week before implementation.</p> <ul style="list-style-type: none"> All possible actions to avoid emergency drought orders 	<p>Moderate environmental impact drought permit and ordinary drought orders:</p> <ul style="list-style-type: none"> Use of Carrs Well (Higher Moors) to support supplies on St Mary's once desalination is optimised (max. 400-450 m3/d).

Notes:

- i) The desalination plant on St Mary's would be optimised to maximise output at Drought Level 1. The maximum sustainable output from the desalination plant is c.400 m3/d, although maximum rates of up to 450 m3/d are achievable over shorter time periods (hours). It is important to note that to achieve acceptable

- water quality for supply, water from the desalination plant needs to be blended with water from the groundwater abstractions.
- ii) Whilst each of the demand/supply side options are considered to save/provide additional water, exact savings/yields are the subject of further investigation and will be confirmed in the updated IoS Appendix in 2024.
 - iii) The availability of 'additional/spare' water for 'tankering' to support other islands will be further assessed and inform the updated IoS Appendix in 2024).

3.1.5 Extreme drought management actions

In an extreme drought we may consider the following 'extreme drought actions' in addition to those already implemented in Levels 1-3 (see Section 3.1.4):

Demand Side:

- Blitz/aggressive media campaign
- Free water saving devices to commercial and domestic customers
- Reduced water consumption by large commercial customers
- Liaison with CloS & tourist boards to support them in making informed decisions about how they manage increased demand from incoming tourists to the island.

Supply side:

- Increased abstraction from Joaney's Well (Lower Moors) to support supplies on St Mary's (despite environmental threshold¹).
- Importing additional spare water from Tresco or other islands (the availability of 'additional/spare' water will be further assessed and inform the updated IoS Appendix in 2024).
- Bringing in bottled water supplies from mainland.
- Further optimisation of groundwater and desalination blend to allow increase output.
- Temporary desalination.

3.1.6 Management Structure and Community Communications Plan

Management and communication are vital in a Drought. Our approach follows the overall structure of the main Drought Plan, Section 5, but has been tailored for the unique operating environment of the Islands.

We will liaise closely with the Environment Agency and other key stakeholders (e.g. CloS) at an early stage (approaching Level 1) and throughout the developing drought.

Specifically, the communication plan uses 'on island' liaison staff to work with the community. This is so it can tailor to the local communities which are much smaller than the mainland. Further details of the management structure and communications plan during a developing drought are provided in Table 3.

¹ Joaneys Well abstraction environmental threshold to be reviewed with EA, NE and IoSWT and agreed as part of environmental monitoring programme requirement resulting from licence determination. We will work with IoS WT and other bodies, as a drought develops, to identify appropriate mitigation for increased abstraction, as required.

Table 3: Overview of management structure and communications plan

Drought Severity Stage	Level	Supply/Demand Actions	Drought Management - leading group	Community Communications plan
Normal operation stage	0	Actions per drought triggers	Isles of Scilly Steering Group	<ul style="list-style-type: none"> Normal operation
Local Drought Liaison Officer in Place				
Drought operation stage	1 (prolonged dry weather)	See specific islands	IoS Drought Group (twice weekly)	<ul style="list-style-type: none"> Community drought liaison officer in place (Enhanced media campaign – phase 1).
	2 (drought)	See specific islands	IoS Drought Group (daily)	<ul style="list-style-type: none"> Community drought support officers in place (enhanced media campaign phase 2). LRF liaison.
	3 (drought)	See specific islands	IoS Platinum Drought Group (daily- weekly)	<ul style="list-style-type: none"> Tailored island comms for NEUB impacts. Board level spokesperson for media.
Emergency operation Stage	4 (severe drought causing rota cuts)	See specific islands	IoS Platinum Drought Group/ Emergency operation	<ul style="list-style-type: none"> Emergency operation.

3.1.6.1 Management Framework- Normal Operation

Under normal operation the Isles of Scilly supply-security actions will be managed through the normal Drinking Water management meetings.

This group will meet once a week. It will review the water resource position on each island and approve the normal operating actions to manage supply security.

3.1.6.2 Management Framework - Drought Operation

If the resource position on any island passes through the Drought Trigger, a separate IoS Drought Group will be implemented.

This will contain the following attendees:

- SWW Drinking Water Services Director
- Operations and Programme manager Isles of Scilly,
- Head of Water Resources,

- Head of Water Quality,
- Engineering Director,
- Customer Services Director,
- Drinking Water Services Director,
- Head of Capital Finance.

Note that from Level 1 onwards we would:

- Be communicating with the Fire Service on the actions we are taking, what they mean for water availability and water pressure. We adopted this process in 2018 and 2019 with weekly updates direct to the Fire Service. We would also provide a weekly LRF update at this stage (see Appendix 5 Communications Plan)
- Have formal liaison meetings with the Environment Agency. We would expect these to be once a week and then increase in frequency if the drought intensifies.
- Communication and data exchange arrangements with the Environment Agency will be as detailed in the main Drought Plan, Section 5.31.
- Approaches from residents or businesses who have private boreholes which have run out of water during drought will be managed in line with the main Drought Plan, Section 3.4.
- The company will work with retailers (if present) and communicate to non-household customers in line with the approach within the main Drought Plan, Section 5.26.
- The company will inform special needs and vulnerable customers in line with the approach within the main Drought Plan, Section 5.28.
- If the company decides that the implementation of TUBS or non-essential use bans is required this will be undertaken in line with the main Drought Plan, Section 5.
- We will continue to monitor and review the effectiveness of our communications plan both during and after a drought in line with the main Drought Plan, Section 5.

From Level 2 onwards, the following representative may be asked to join the Group. This is to ensure the development of the plans is done in agreement with the local island community needs.

- Local authority Representation (i.e. Council of the Isles of Scilly)
- Tourism group representation,
- LRF

This IoS Drought Management Group will meet twice weekly on triggering level 1 and may increase in frequency if the situation deteriorates.

Under Level 3 restrictions and beyond (see Table 3) the Group will be chaired by the Company CEO. This is consistent with the level of risk as severe restrictions in use will be needed.

3.1.6.3 Drought Operation Management Agenda

For Level 1 to 4, the Drought Group will step through the following for **each Island in the same meeting**:

- Current supply-demand position,

- Current Customer Issues,
- Forecast supply-demand position,
- Supply Actions,
- Demand Actions,
- Community communication and support,
- Media and Regulation Statements.

A single meeting is used to allow actions to be co-ordinated across all the islands efficiently and consistently.

In future Drought Plans we may move to Island by Island management meetings once the Drought Triggers are specific to each island.

3.1.6.3 Emergency Operation

Under Level 4, extreme drought measures would be in place. The structure and format would be developed in the lead up to reflect the specific local island circumstances.

3.1.6.4 Community Communications Plan

We will adopt a traffic light system to communicate the Drought Risk on the islands. The purpose will be to:

- To be early and proactive,
- To be informative,
- To be clear on what we are doing to mitigate risks,
- To be clear on what is being asked of customers, retailers and stakeholders,
- To be flexible and agile to deal with a range of drought events,
- To treat all customers fairly and consistently,
- To tailor communications for each Island.

The key phases are:

- Normal operating phase: Traffic Light – Green

This phase will run an annual water efficiency media campaign each summer for awareness.

- Level 1 – media campaign: Traffic Light – Amber

This phase will initiate a media campaign calling on action is needed. It includes an 'on island' drought community officer to aide communication with the community on the situation.

- Level 2 – demand restrictions phase: Traffic Light – Amber (restrictions)

This phase will see temporary use bans in place. Drought community support offices will be in place on each island to support the communities.

- Level 3 – severe demand restrictions phase: Traffic Light – Red

This phase will see non-essential use bans in place. This will be managed through on island presence.

- Level 4 – Emergency operation (Traffic Light – Black)

This phase would invoke rota cuts. The communication in this phase would be developed for the specific event.

Full details of the activities in each phase is given in Appendix C.

3.1.7 Coming out of a Drought

As the Islands come out of the drought, we would operate the above process in reverse and gradually reduce the actions being taken to manage supply and demand.

3.1.8 Environmental assessment, monitoring and mitigation

There are two environmentally designated areas on St Marys which have the potential to be impacted by groundwater abstraction: Higher Moors SSSI and Lower Moors SSSI. Natural England have designated these areas as “favourable condition” (the highest category) and “unfavourable – recovering”, respectively.

Recent assessment and monitoring of the Lower Moors SSSI (undertaken for the IoS Wildlife Trust) has provided sufficient information for us to carry out initial environmental assessment for the Joaneys Well groundwater source, which is located immediately adjacent to the Lower Moors SSSI on St Marys. Summary tables are provided in Appendix D. The assessment of the Rocky Hill groundwater source, which may also impact the Lower Moors SSSI, will be informed by additional monitoring and survey, delivered by the monitoring plan, and included in the updated Drought Plan, due December 2024.

The effectiveness of the environmental assessment, monitoring programmes and mitigation measures is dependent on having suitable baseline monitoring networks in place. The monitoring requirement for St Mary’s and the other islands is to be reviewed in consultation with the Environment Agency, Natural England, and the IoS Wildlife Trust. An appropriate monitoring programme will then be agreed with the Environment Agency for implementation by 31st March 2024 at the latest.

The draft drought plan will be updated with the relevant environmental assessments, monitoring programmes and proposed mitigation measures once agreement has been reached with the Environment Agency.

The SSSIs on the Isles of Scilly are either favourable condition or recovering. SWW are committed to ensuring no deterioration in the condition of the IoS SSSIs.

3.1.9 End of Drought

The end of the drought will be defined by demand dropping below the specified trigger threshold and GW level recovering above the trigger threshold for a sufficient period and combined with a favourable forecast of significant rainfall.

It is intended to undertake further detailed analysis linking rainfall, soil moisture deficit and groundwater levels through the development of conceptual groundwater model(s) for each

island. The company intends to use a combination of rainfall, soil moisture deficit recovery together with forecast rainfall to inform its 'end of drought' predictions and will liaise with the Environment Agency to confirm the drought has ended before declaring it. The outputs of this work will be included in the updated IoS Appendix in 2024.

As with our mainland water supply areas, we will undertake a review of our Isles of Scilly Draft Drought Plan implementation within six months of the end of a drought (see main Drought Plan, Section 7). Given we have been responsible for water supply of the islands for only a limited time and our draft drought plan is untested, we would seek to update and improve our management learning from our experiences and the additional environmental and other data that would have been generated.

We would seek to work with the Environment Agency and various authorities on the islands (e.g. Council of the Isles of Scilly, Duchy of Cornwall, Tresco Estates) to listen to any concerns or recommendations that they may have to ensure future droughts are managed to limit the impact on the population and the environment.

4.0 St Martin's

4.1 St Martins Draft Drought Plan

4.1.1 Background

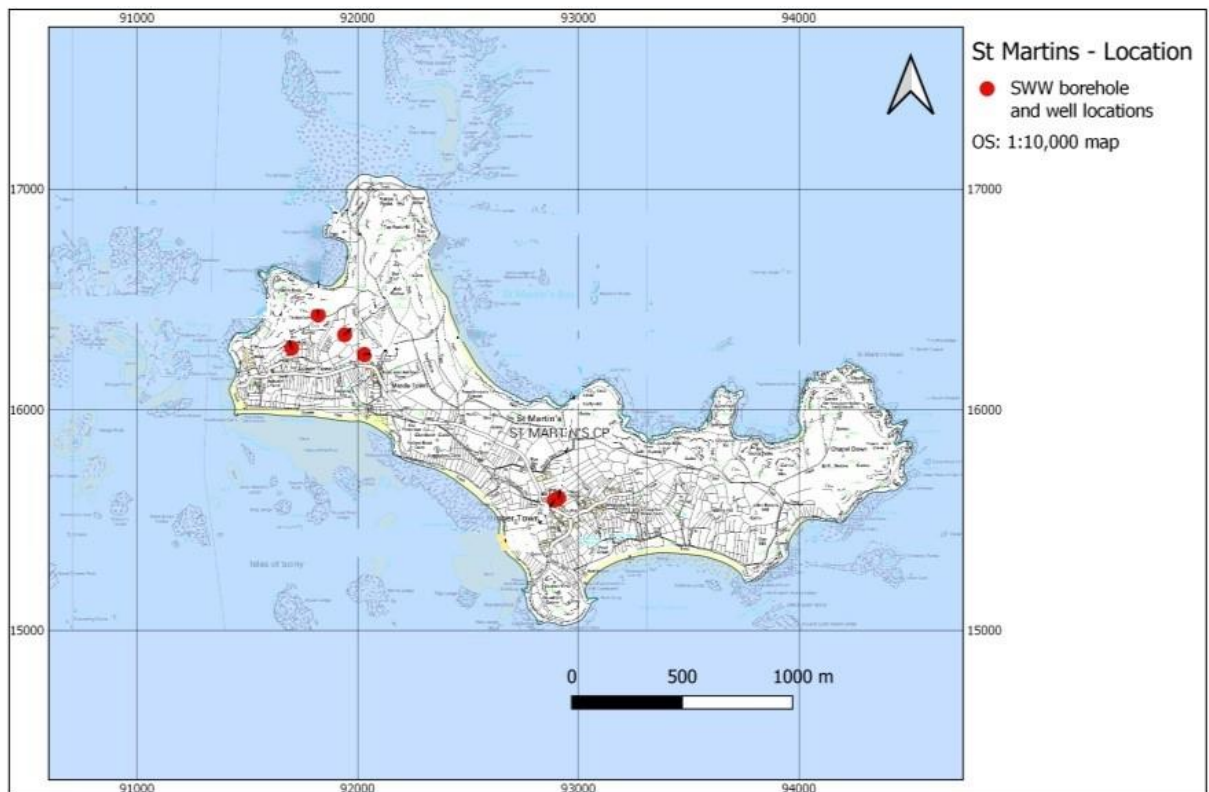
St Martins is the fourth largest island with a small residential population (136 residents in 2011) and second lowest demand for water. The current water supplies are obtained entirely from groundwater sources fed from two catchment areas located towards the north end of the island and one towards the south end. There is currently no desalination on St Martins. There are currently no groundwater related environmentally designated areas on the island.

The groundwater supply on St Martins comes from three paired boreholes (i.e. 6 boreholes total) located at:

- Hightertown (Boreholes Hightertown BH1 North & BH1 South)
- Middletown (Boreholes Middletown BH2a & BH2b)
- Lowertown (Boreholes Lowertown BH3a & BH3b)

The location of these sources is shown in Figure 7.

Figure 7: Location of St Martins groundwater supply sources.



4.1.2 Drought Vulnerability

We have completed a provisional drought vulnerability assessment for the islands. This is provided in Appendix A. We have classified as **HIGH VULNERABILITY**. The key reasons for this are:

- The small surplus of supply capacity over demand in the summer months.
- The limited storage in the main aquifer system and its reliance on regular recharge events.
- No interconnectivity between the islands.
- Lack of long-term source performance data.
- Lack of support available from alternative, essentially mainland, sources of supply.
- Islands are classified as “Serious” under recent reclassification of water stressed regions in the UK (see Appendix A).

4.1.3 Drought triggers

In this Section we set out the triggers that we will use to manage water resources in a drought and how we have tested them against the prolonged dry period and high demands of 2018 and a more severe event similar to the summer of 1976.

We have derived a series of drought triggers based on a combination of groundwater levels and demand severity, as well as considering meteorological conditions e.g. rainfall and temperature. The triggers are used to identify different severities of drought (levels 1 to 4) following the approach outlined in the EA guidelines.

We will use these drought triggers to identify when we should consider implementing specific drought actions to reduce demand and, if necessary, to obtain extra water resources.

The existing drought triggers will be reviewed and any revisions included in the updated Drought Plan in December 2024. It is intended that where possible the revised drought triggers will be island specific and based on any additional data and information that can be obtained, including that provided by the proposed monitoring programme.

4.1.3.1 St Martins drought triggers

The drought triggers for St Martins utilise a combination of groundwater level stress curves and demand curves as detailed in Figure’s 8 & 9 below.

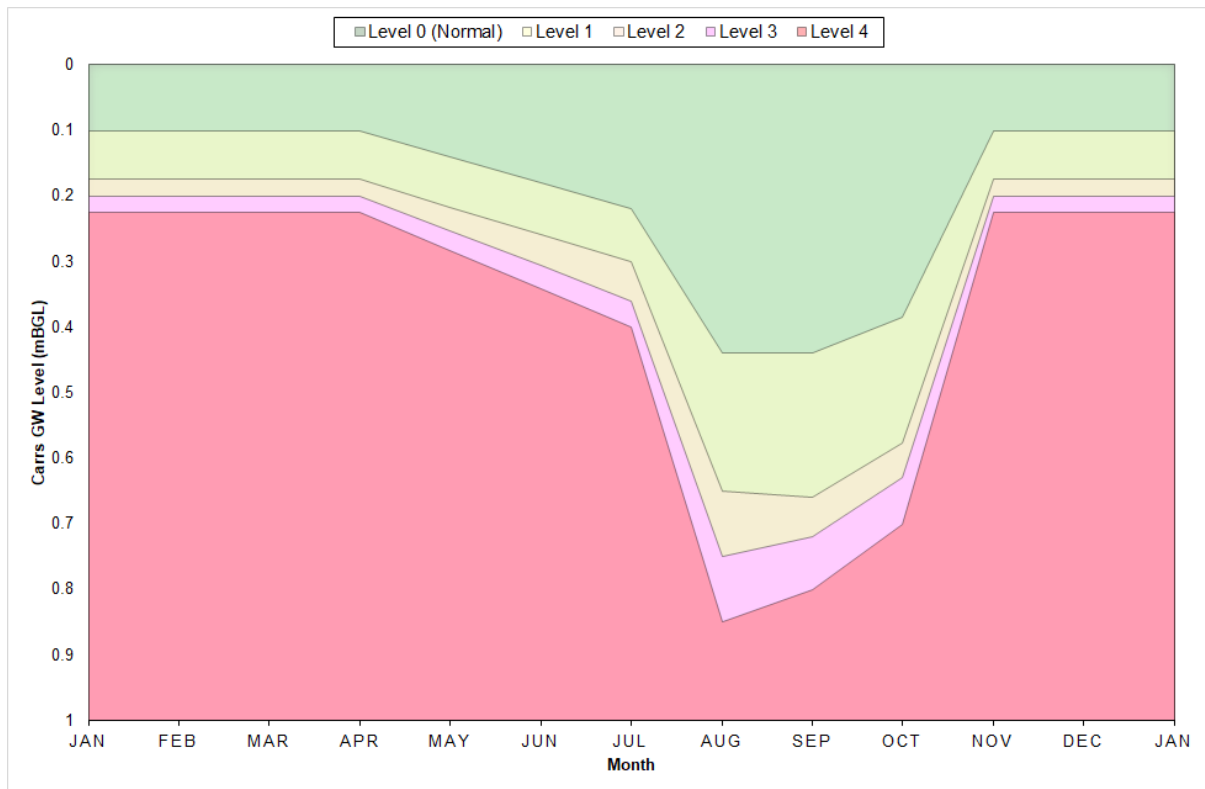
4.1.3.2 Groundwater triggers

The St Martins groundwater triggers are currently based on the groundwater level stress curves derived for St Mary’s due to the lack of a suitable monitoring locations on St Martins. Island specific groundwater level stress curves for St Martins will be derived once a monitoring network and programme have been established.

The St Mary’s drought trigger assessment is based on groundwater levels in Carrs Well, which is located adjacent to the Higher Moors wetland area on St Mary’s. The drought curves identify different drought severities. Due to the similar hydrogeology and weather

conditions experienced on both islands the St Mary's drought curve is expected to provide a reasonable indicator of environmental stress as a drought develops on St Martins.

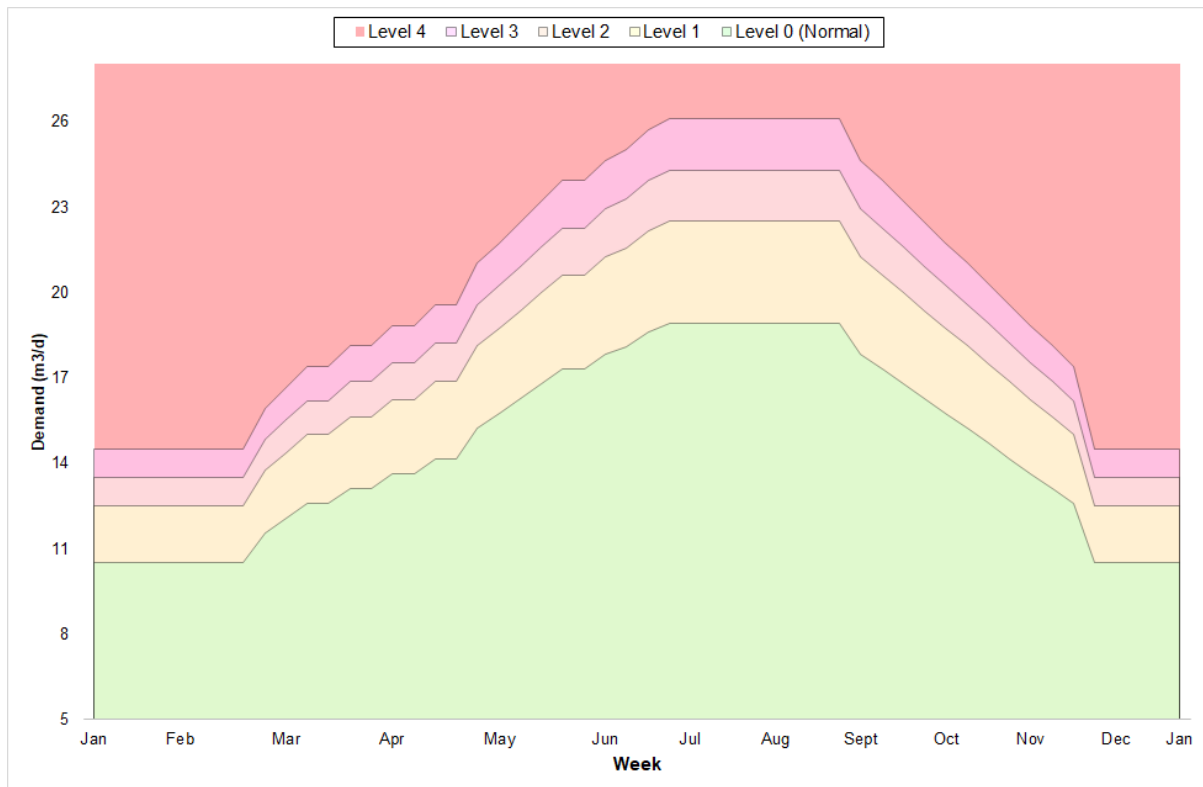
Figure 8: St Mary's environmental triggers used for St Martins (based on Carrs Well, St Mary's)



4.1.3.3 Demand triggers

The demand triggers have been derived using the recently available demand data (2015-20) for St Martins with particular focus on annual demand profiles and key periods of high demand. These are highlighted on Figure 9 and include Easter, the annual Gig Boat Racing Championships, the Summer Holiday period and October Half term.

Figure 9: St Martins demand trigger curve



4.1.3.4 Additional environmental drought triggers

In addition to groundwater and demand levels, other criteria, such as rainfall, will be considered in assessing the drought severity level. These will be used to inform our response as a drought develops and the actions that we may wish to put in place.

These are listed for St Mary's in the technical appendix (Appendix B).

4.1.3.5 Testing our drought triggers

We tested our drought triggers against the 2018 dry weather event to check their appropriateness for an event for which we have data and recent operational experience.

During the 2018 event groundwater levels reached the Level 1 Trigger threshold as shown in Figure 10 below, whilst demands peaked in the second week of May. An enhanced communications campaign was eventually implemented throughout July and August which saw repeated media messaging. The media campaign was effective in constraining demand (see Figure 11) and was followed by a change to wetter weather. These factors prevented the event from passing the Level 2 Trigger threshold. We are confident that our overall approach and the triggers is appropriate for this current version of the draft Drought Plan.

Figure 10: St Mary's Drought curve - 2018 event used for St Martins

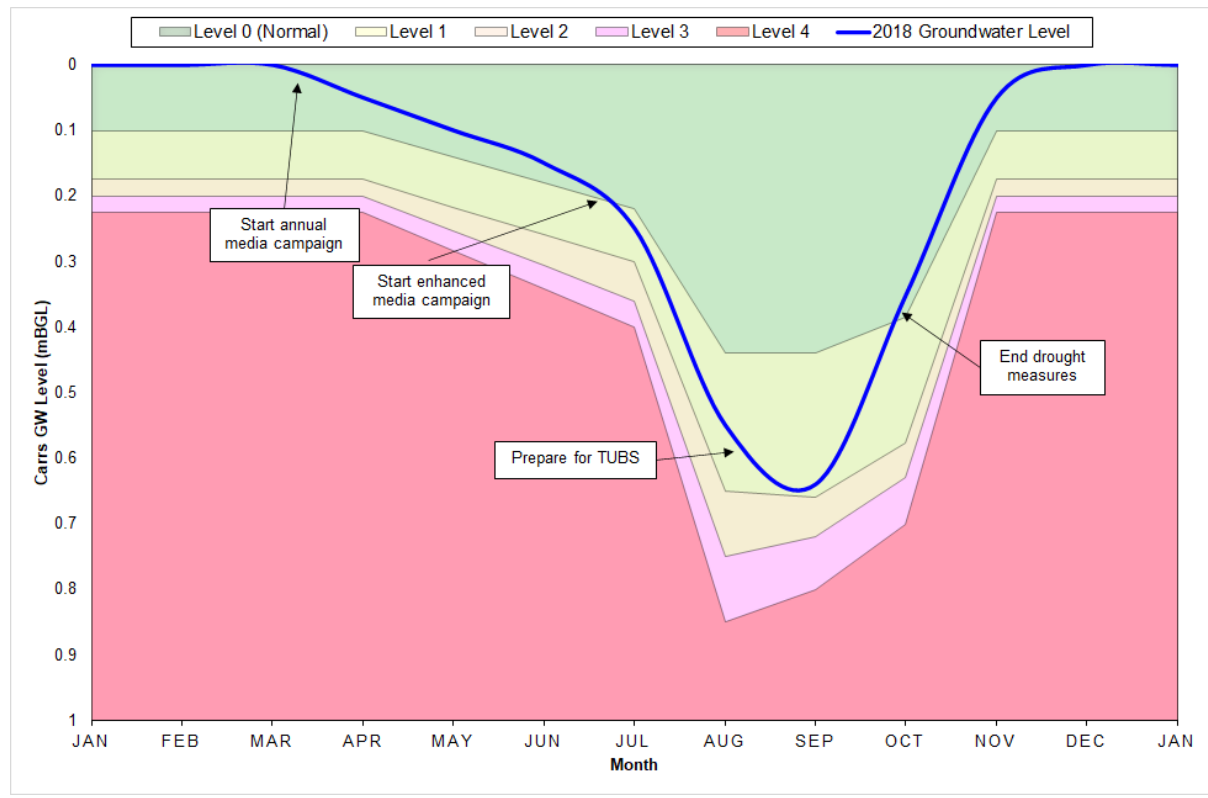
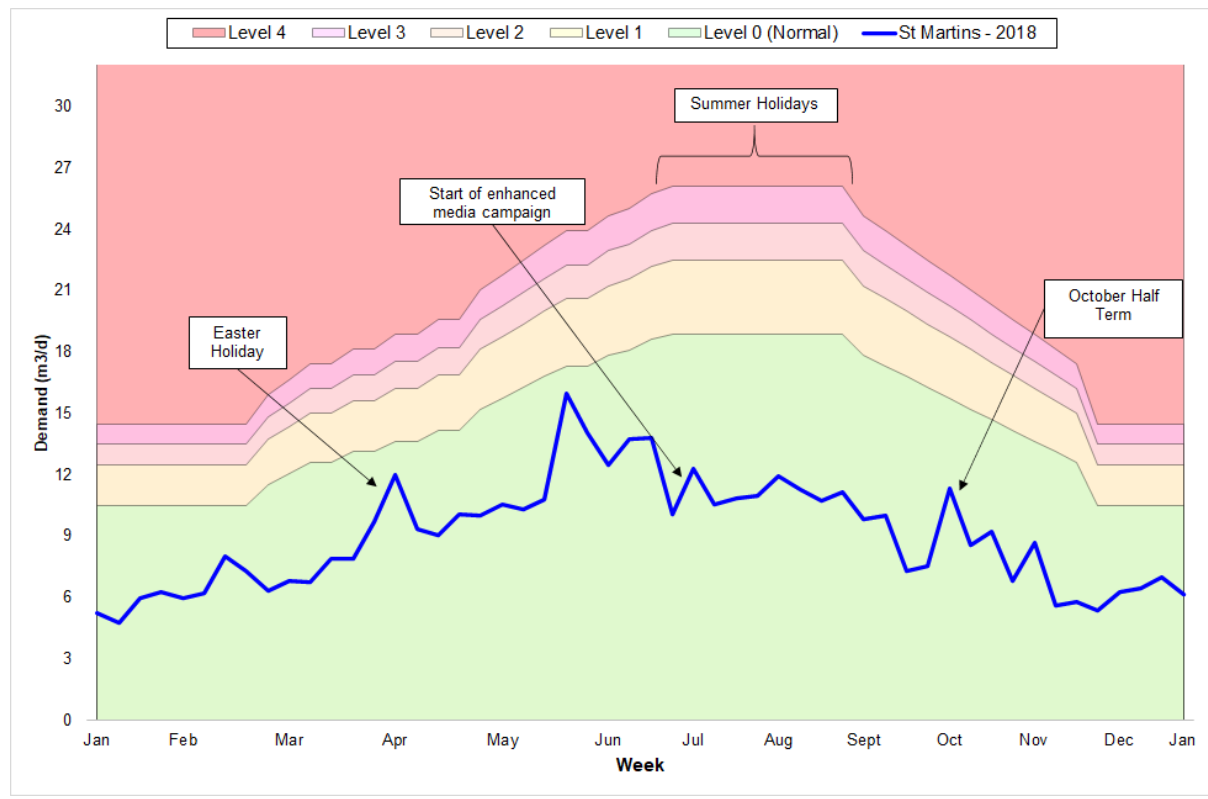


Figure 11: St Martins Demand curve - 2018 event.



4.1.4 Drought actions

Table 4 below provides a summary of possible drought actions we may adopt as drought severity increases. Demand actions will be implemented ahead of supply actions at the same drought level whenever appropriate to do so.

As a Drought develops, we would look to work with the local community to adapt the options for local knowledge and need to achieve the least impact on the community and the environment.

Table 4: Isles of Scilly St Martins drought action summary

Severity of the drought	Drought Severity Level	Demand side actions	Supply side actions
Normal operating	Level 0	Annual media campaign (see comms plan)	
Drought Operation - prolonged dry weather	Level 1	<ul style="list-style-type: none"> Discussion with large commercial customer re timing of highest water use to avoid peak demand periods. Community Drought Liaison Officer (Enhanced media campaign Phase 1). Preparation 4 weeks before Level 1, plus 1 week for implementation. <ul style="list-style-type: none"> Increased leakage control. Implementation approx. 4 to 8 weeks <ul style="list-style-type: none"> Enhanced pressure management. Implementation approx. 1 to 4 weeks	Drought actions with minor environmental impacts: <ul style="list-style-type: none"> optimising sources outage minimisation
Drought Operation - drought	Level 2	<ul style="list-style-type: none"> Temporary use bans. Advertising time and period for representations (see Section 3.3.1 of main Drought Plan) Typically, the preparation would start 4-6 weeks prior to implementation. Advertised 1 week before implementation. <ul style="list-style-type: none"> Community Drought Support officer (Enhanced media campaign Phase 2). 	Drought actions with minor environmental impacts: <ul style="list-style-type: none"> 'Tankering' – provision of bowzers to strategic locations on the islands to support/supplement existing network e.g. to overcome constraints in the current distribution network. Increase storage capacity with temp storage tanks/reservoirs (above ground).
	Level 3	<ul style="list-style-type: none"> Non-essential use bans Advertising time and period for representations Typically, the preparation would start 4-6 weeks prior to implementation. Advertised 1 week before implementation.	<ul style="list-style-type: none"> Approach 3rd party resource owners to identify potential spare water availability. Further Level 3 supply options to be determined following further data collation and analysis.

		All possible actions to avoid emergency drought orders	
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Notes:

- i) Whilst each of the demand/supply side options are considered to save/provide additional water, exact savings/yields are the subject of further investigation and will be confirmed in the updated IoS Appendix in 2024.
- ii) The availability of 'additional/spare' water for 'tankering' to support other islands will be further assessed and inform the updated IoS Appendix in 2024).
- iii) Third party resource owners will be approached in 2022/23 as part of the implementation of the monitoring programme. SWW also plans to liaise with CloS to further explore the availability of additional information regarding 3rd party resource owners.

4.1.5 Extreme drought management actions

In an extreme drought we may consider the following 'extreme drought actions' in addition to those already implemented in Levels 1-3 (see Section 4.1.4):

Demand Side:

- Blitz/aggressive media campaign
- Free water saving devices to commercial and domestic customers
- Reduced water consumption by large commercial customers
- Liaison with CloS & tourist boards to support them in making informed decisions about how they manage increased demand from incoming tourists to the island.

Supply side:

- Importing additional spare water from Tresco or other islands (the availability of 'additional/spare' water will be further assessed and inform the updated IoS Appendix in 2024).
- Bringing in bottled water supplies from mainland.
- Temporary desalination.

4.1.6 Management Structure and Community Communications Plan

Management and communication are vital in a Drought. Our approach follows the overall structure of the main Drought Plan, Section 5, but has been tailored for the unique operating environment of the Islands.

We will liaise closely with the Environment Agency and other key stakeholders (e.g. CloS) at an early stage (approaching Level 1) and throughout the developing drought.

Specifically, the communication plan uses 'on island' liaison staff to work with the community. This is so it can be tailored to the local communities which are much smaller than the mainland. Table 5 summarises the approach.

Table 5: Overview of management structure and communications plan

Drought Severity Stage	Level	Supply/ Demand Actions	Drought Management - leading group	Community Communications plan
Normal operation stage	0	Action as per drought triggers	Isles of Scilly Steering Group	<ul style="list-style-type: none"> Normal operation
Local Drought Liaison Officer in Place				
Drought operation stage	1 (prolonged dry weather)	See specific islands	IoS Drought Group (twice weekly)	<ul style="list-style-type: none"> Community drought liaison officer in place (Enhanced media campaign – phase 1).
	2 (drought)	See specific islands	IoS Drought Group (daily)	<ul style="list-style-type: none"> Community drought support officers in place (enhanced media campaign phase 2). LRF liaison.
	3 (drought)	See specific islands	IoS Platinum Drought Group (daily- weekly)	<ul style="list-style-type: none"> Tailored island comms for NEUB impacts. Board level spokesperson for media.
Emergency operation Stage	4 (severe drought causing rota cuts)	See specific islands	IoS Platinum Drought Group/ Emergency operation	<ul style="list-style-type: none"> Emergency operation.

4.1.6.1 Management Framework- Normal Operation

The process is set out under St Mary's and will apply to all islands.

4.1.6.2 Management Framework- Drought Operation

The process is set out under St Mary's and will apply to all islands.

We would look to bring in Duchy of Cornwall representation from Level 2 if needed. This is to ensure the development of the plans is done in agreement with the local island community needs.

4.1.6.3 Drought Operation Management Agenda

The process is set out under St Mary's and will apply to all islands.

4.1.6.3 Emergency Operation

Under Level 4, emergency operation would be in place. The structure and format would be developed in the lead up to reflect the specific local island circumstances.

4.1.6.4 Community Communications Plan

We will adopt a traffic light system to communicate the Drought Risk on the islands. The purpose will be to:

- To be early and proactive,
- To be informative,
- To be clear on what we are doing to mitigate risks,
- To be clear on what is being asked of customers, retailers and stakeholders,
- To be flexible and agile to deal with a range of drought events,
- To treat all customers fairly and consistently,
- To tailor communications for each Island.

The key phases are:

- Normal operating phase: Traffic Light – Green

This phase will run an annual water efficiency media campaign each summer for awareness.

- Level 1 – media campaign: Traffic Light – Amber

This phase will initiate a media campaign calling on action is needed. It includes an ‘on island’ drought community officer to aide communication with the community on the situation.

- Level 2 – demand restrictions phase: Traffic Light – Amber (restrictions)

This phase will see temporary use bans in place. Drought community support offices will be in place on each island to support the communities.

- Level 3 – severe demand restrictions phase: Traffic Light – Red

This phase will see non-essential use bans in place. This will be managed through on island presence.

- Level 4 – Emergency operation (Traffic Light – Black)

This phase would invoke rota cuts. The communication in this phase would be developed for the specific event.

Full details of the activities in each phase is given in Appendix C.

4.1.7 Coming out of a Drought

As the Islands come out of the drought, we would operate the above process in reverse and gradually reduce the actions being taken to manage supply and demand.

4.1.8 Environmental assessment, monitoring and mitigation

Further monitoring is required to confirm whether there are any impacts of groundwater abstraction on environmentally designated areas on St Martins.

The effectiveness of the environmental assessment, monitoring programmes and mitigation measures is dependent on having suitable baseline monitoring networks in place. The monitoring requirement for St Martin's and the other islands is to be reviewed in consultation with the Environment Agency, Natural England, and the IoS Wildlife Trust. An appropriate monitoring programme will then be agreed with the Environment Agency for implementation by 31st March 2024 at the latest.

The draft drought plan will be updated with the relevant environmental assessments, monitoring programmes and proposed mitigation measures once agreement has been reached with the Environment Agency.

The SSSIs on the Isles of Scilly are either favourable condition or recovering. SWW are committed to ensuring no deterioration in the condition of the IoS SSSIs.

4.1.9 End of Drought

The end of the drought will be defined by demand dropping below the specified trigger threshold and GW level recovering above the trigger threshold for a sufficient period and combined with a favourable forecast of significant rainfall.

It is intended to undertake further detailed analysis linking rainfall, soil moisture deficit and groundwater levels through the development of conceptual groundwater model(s) for each island. The company intends to use a combination of rainfall, soil moisture deficit recovery together with forecast rainfall to inform its 'end of drought' predictions and will liaise with the Environment Agency to confirm the drought has ended before declaring it. The outputs of this work will be included in the updated IoS Appendix in 2024.

As with our mainland water supply areas, we will undertake a review of our Isles of Scilly Draft Drought Plan implementation within six months of the end of a drought (see main Drought Plan, Section 7). Given we have been responsible for water supply of the islands for only a limited time and our draft drought plan is untested, we would seek to update and improve our management learning from our experiences and the additional environmental and other data that would have been generated.

We would seek to work with the Environment Agency, local authorities and key stakeholders on the islands (e.g. Council of the Isles of Scilly, Duchy of Cornwall, Tresco Estates) to listen to any concerns or recommendations that they may have to ensure future droughts are managed to limit the impact on the population and the environment.

5.0 St Agnes

5.1 St Agnes Draft Drought Plan

5.1.1 Background

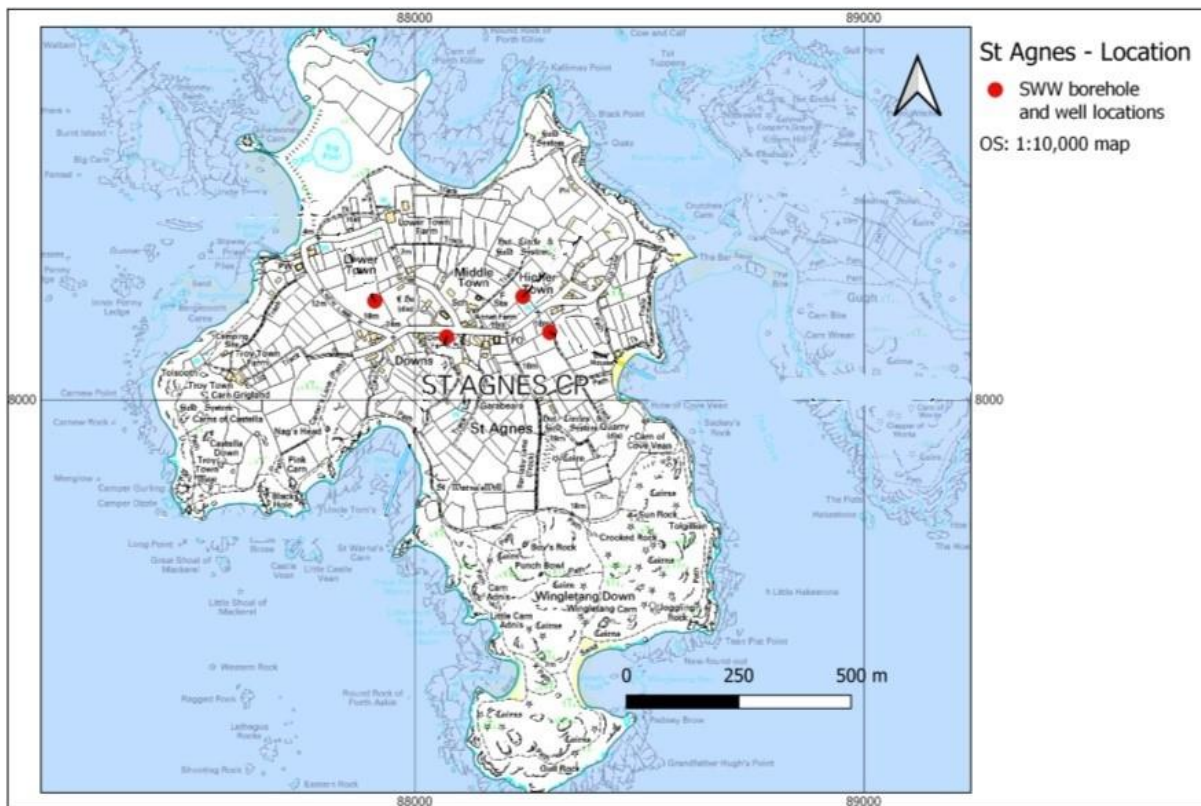
St Agnes is the second smallest inhabited island by area with a small residential population (82 residents in 2011) similar to that of Bryher. It has the lowest demand for water of all the islands. The current water supplies are obtained entirely from groundwater sources fed from two catchment areas located relatively centrally on the island. There is currently no desalination on St Agnes. There are currently no groundwater related environmentally designated areas on the island.

The groundwater supply on St Agnes comes from two paired boreholes (i.e. 4 boreholes total) known as:

- Plump (Boreholes Plump BH1 & BH2)
- Tommy's (Boreholes Tommy's BH1 & BH2)

The location of these sources is shown in Figure 12.

Figure 12: Location of St Agnes groundwater supply sources.



5.1.2 Drought Vulnerability

We have completed a provisional drought vulnerability assessment for the islands. This is provided in Appendix A. We have classified as **HIGH VULNERABILITY**. The key reasons for this are:

- The small surplus of supply capacity over demand in the summer months.
- The limited storage in the main aquifer system and its reliance on regular recharge events.
- No interconnectivity between the islands.
- Lack of long-term source performance data.
- Lack of support available from alternative, essentially mainland sources of supply. Islands are classified as “Serious” under recent reclassification of water stressed regions in the UK.

5.1.3 Drought triggers

In this Section we set out the triggers that we will use to manage water resources in a drought and how we have tested them against the prolonged dry period and high demands of 2018 and a more severe event similar to the summer of 1976.

We have derived a series of drought triggers based on a combination of groundwater levels and demand severity, as well as considering meteorological conditions e.g. rainfall and temperature. The triggers are used to identify different severities of drought (levels 1 to 4) following the approach outlined in the EA guidelines.

We will use these drought triggers to identify when we should consider implementing specific drought actions to reduce demand and, if necessary, to obtain extra water resources.

The existing drought triggers will be reviewed and any revisions included in the updated Drought Plan in December 2024. It is intended that where possible the revised drought triggers will be island specific and based on any additional data and information that can be obtained, including that provided by the proposed monitoring programme.

5.1.3.1 St Agnes drought triggers

The drought triggers for St Agnes utilise a combination of groundwater level stress curves and demand curves as detailed in Figure’s 13 & 14 below.

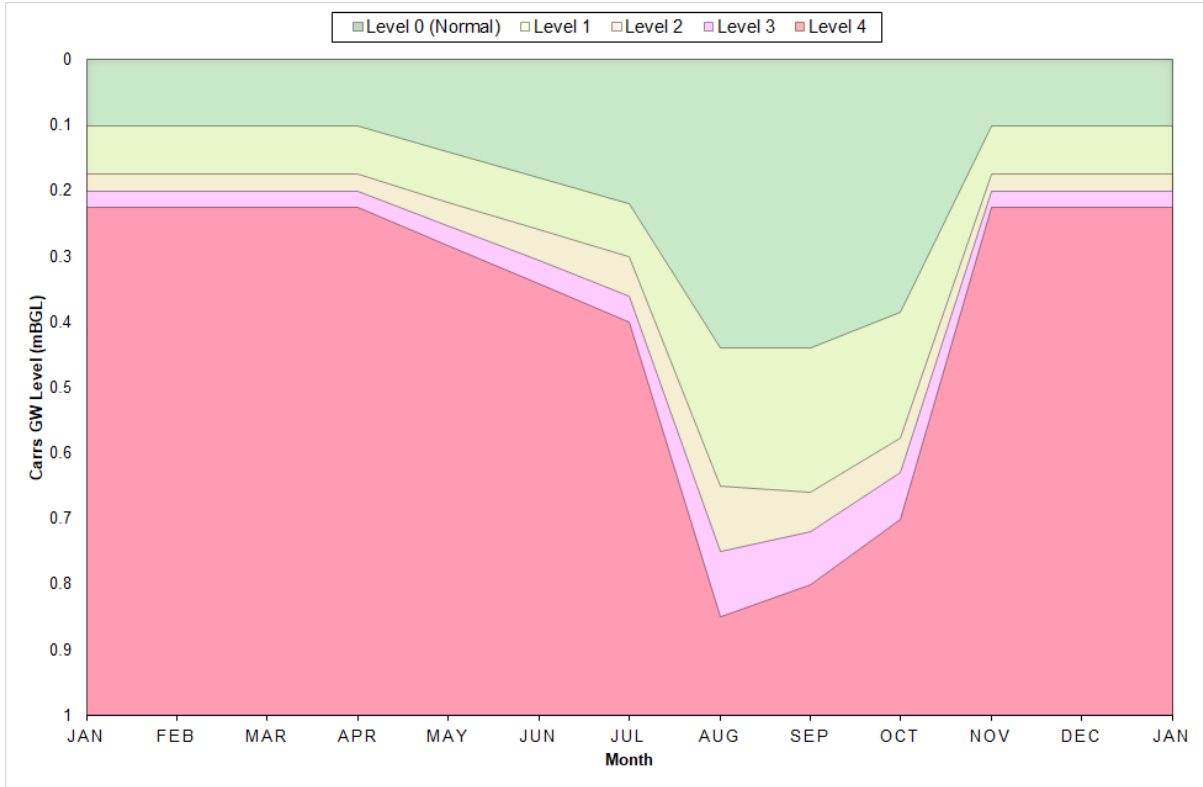
5.1.3.2 Groundwater triggers

The St Agnes groundwater triggers are currently based on the groundwater level stress curves derived for St Mary’s due to the lack of a suitable observation borehole. Island specific groundwater level stress curves for St Agnes will be derived once a suitable observation borehole has either been identified or a new borehole drilled.

The St Mary’s drought trigger assessment is based on groundwater levels in Carrs Well, which is located adjacent to the Higher Moors wetland area on St Mary’s. The drought curves identify different drought severities. Due to the similar underlying hydrogeology and weather conditions experienced on both islands the St Mary’s drought curve is expected to

provide a reasonable first approximation of groundwater triggered drought conditions on St Agnes.

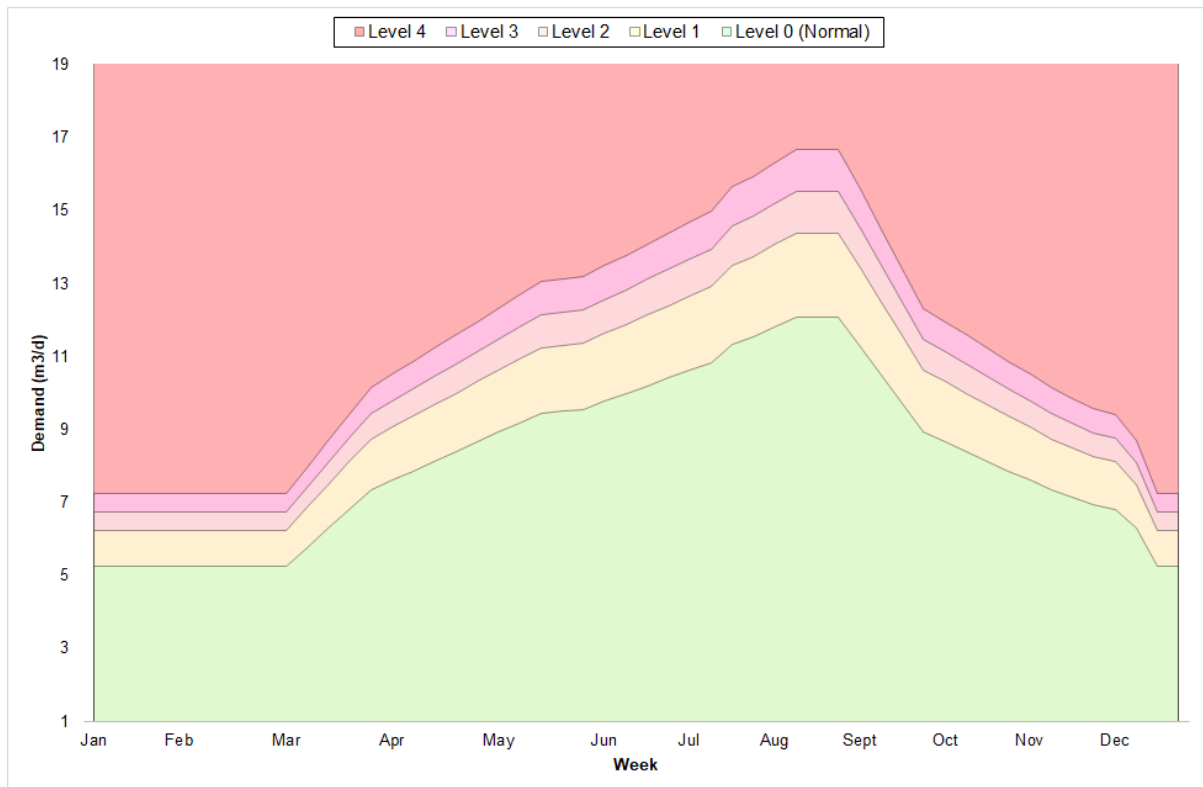
Figure 13: St Mary's environmental triggers used for St Agnes (based on Carrs Well, St Mary's)



5.1.3.3 Demand triggers

The demand triggers (Figure 14) have been derived using the recently available demand data for St Agnes with particular focus on annual demand profiles and key periods of high demand. These include Easter, the annual Gig Boat Racing Championships, August Bank Holiday and October Half term.

Figure 14: St Agnes demand trigger curve



5.1.3.4 Additional environmental drought triggers

In addition to groundwater and demand levels, other criteria, such as rainfall, will be considered in assessing the drought severity level. These will be used to inform our response as a drought develops and the actions that we may wish to put in place.

These are listed for St Mary's in the technical appendix (Appendix B).

5.1.3.5 Testing our drought triggers

For St Agnes we tested our environmental drought trigger against the 2018 dry weather event to check its appropriateness for an event for which we have data and recent operational experience.

During the 2018 event groundwater levels reached the Level 1 Trigger threshold as shown in Figure 15 below, whilst demands peaked in the second week of June. An enhanced communications campaign was eventually implemented throughout July and August which saw repeated media messaging. The media campaign was effective in constraining demand (see Figure 16) and was followed by a change to wetter weather. These factors prevented the event from passing the Level 2 Trigger threshold. We are confident that our overall approach and the triggers is appropriate for this current version of the draft Drought Plan.

Figure 15: St Mary's Drought curve - 2018 event used for St Agnes

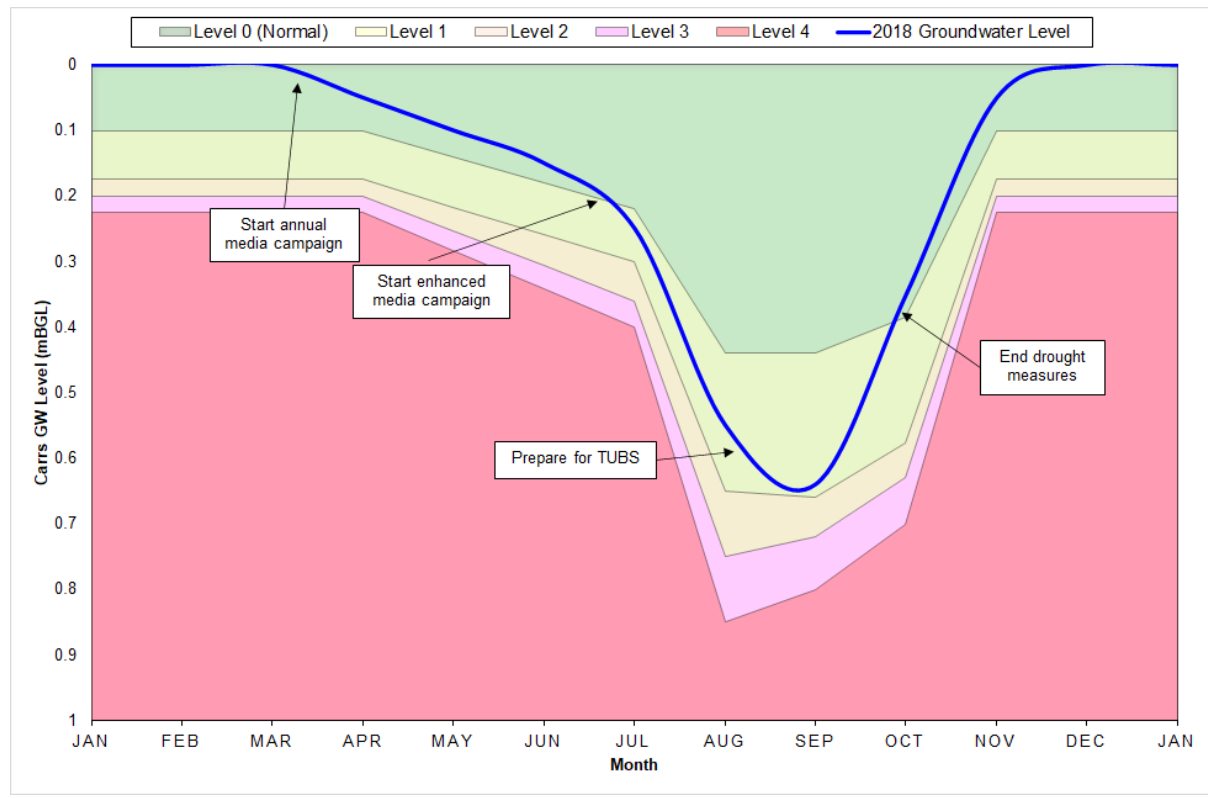
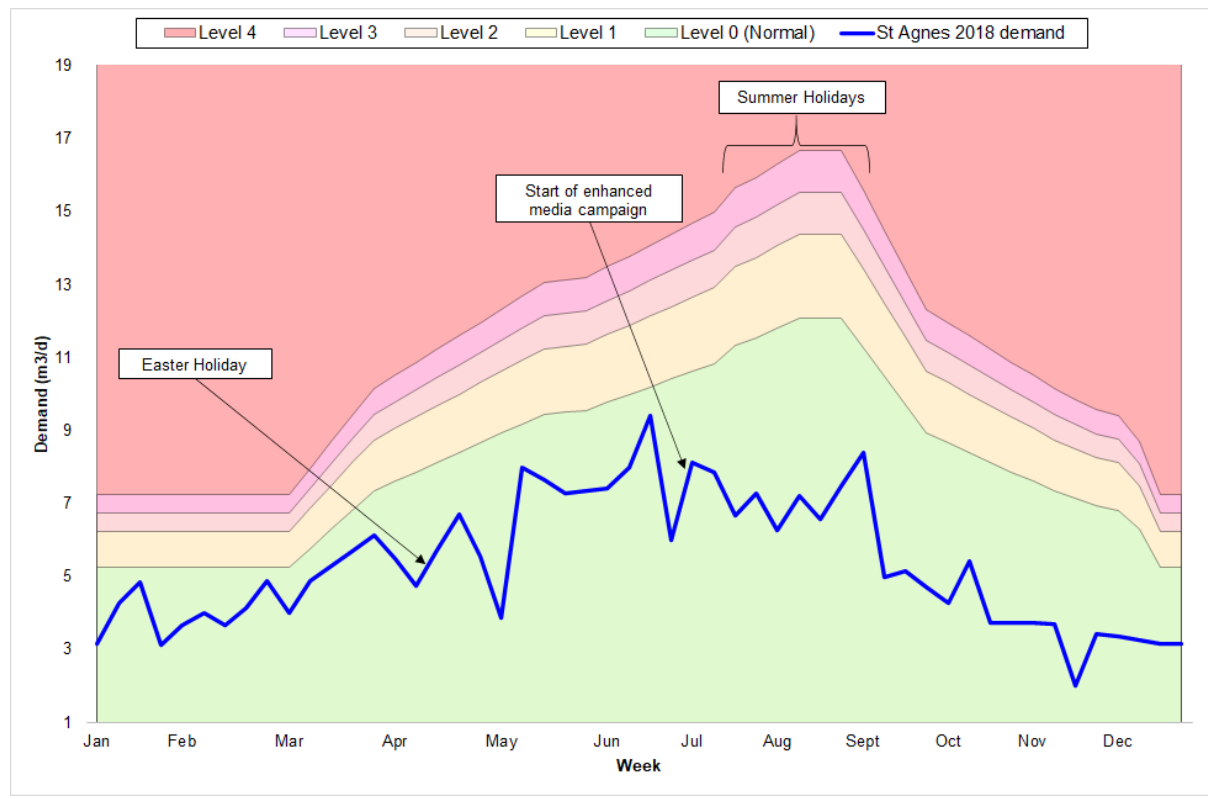


Figure 16: St Agnes Demand curve - 2018 event.



5.1.4 Drought actions

Table 6 below provides a summary of possible drought actions we may adopt as drought severity increases. Demand actions will be implemented ahead of supply actions at the same drought level whenever appropriate to do so.

As a Drought develops, we would look to work with the Environment Agency and local community to adapt the options for local knowledge and need to achieve the least impact on the community and the environment.

Table 6: Isles of Scilly St Agnes drought action summary

Severity of the drought	Drought Severity Level	Demand side actions	Supply side actions
Normal operating	Level 0	Annual media campaign (see comms plan)	
Drought Operation - prolonged dry weather	Level 1	<ul style="list-style-type: none"> Discussion with large commercial customer re timing of highest water use to avoid peak demand periods. Community Drought Liaison Officer (Enhanced media campaign Phase 1). Preparation 4 weeks before Level 1, plus 1 week for implementation. <ul style="list-style-type: none"> Increased leakage control. Implementation approx. 4 to 8 weeks <ul style="list-style-type: none"> Enhanced pressure management. Implementation approx. 1 to 4 weeks 	Drought actions with minor environmental impacts: <ul style="list-style-type: none"> optimising sources outage minimisation
Drought Operation - drought	Level 2	<ul style="list-style-type: none"> Temporary use bans. Advertising time and period for representations (see Section 3.3.1 of main Drought Plan) Typically, the preparation would start 4-6 weeks prior to implementation. Advertised 1 week before implementation. <ul style="list-style-type: none"> Community Drought Support officer (Enhanced media campaign Phase 2). 	Drought actions with minor environmental impacts: <ul style="list-style-type: none"> 'Tankering' – provision of bowsers to strategic locations on the islands to support/supplement existing network e.g. to overcome constraints in the current distribution network. Increase storage capacity with temp storage tanks/reservoirs (above ground).
	Level 3	<ul style="list-style-type: none"> Non-essential use bans Advertising time and period for representations Typically, the preparation would start 4-6 weeks prior to implementation.	<ul style="list-style-type: none"> Approach 3rd party resource owners to identify potential spare water availability. Further Level 3 supply options to be determined following further data collation and analysis.

		<p>Advertised 1 week before implementation.</p> <p>All possible actions to avoid emergency drought orders</p>	
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Notes:

- i) Whilst each of the demand/supply side options are considered to save/provide additional water, exact savings/yields are the subject of further investigation and will be confirmed in the updated IoS Appendix in 2024.
- ii) The availability of 'additional/spare' water for 'tankering' to support other islands will be further assessed and inform the updated IoS Appendix in 2024).
- iii) Third party resource owners will be approached in 2022/23 as part of the implementation of the monitoring programme. SWW also plans to liaise with CloS to further explore the availability of additional information regarding 3rd party resource owners.

5.1.5 Extreme drought management actions

In an extreme drought we may consider the following 'extreme drought actions' in addition to those already implemented in Levels 1-3 (see Section 5.1.4):

Demand Side:

- Blitz/aggressive media campaign
- Free water saving devices to commercial and domestic customers
- Reduced water consumption by large commercial customers
- Liaison with CloS & tourist boards to support them in making informed decisions about how they manage increased demand from incoming tourists to the island.

Supply side:

- Importing additional spare water from Tresco or other islands (the availability of 'additional/spare' water will be further assessed and inform the updated IoS Appendix in 2024).
- Bringing in bottled water supplies from mainland.
- Temporary desalination.

5.1.6 Management Structure and Community Communications Plan

Management and communication are vital in a Drought. Our approach follows the overall structure of the mainland Drought Plan, Section 5, but has been tailored for the unique operating environment of the Islands.

We will liaise closely with the Environment Agency and other key stakeholders (e.g. CloS) at an early stage (approaching Level 1) and throughout the developing drought.

Specifically, the communication plan uses 'on island' liaison staff to work with the community. This is so it can tailor to the local communities which are much smaller than the mainland. Table 7 summarises the approach.

Table 7: Overview of management structure and communications plan

Drought Severity Stage	Level	Supply/Demand Actions	Drought Management - leading group	Community Communications plan
Normal operation stage	0	Actions as per drought triggers	Isles of Scilly Steering Group	<ul style="list-style-type: none"> Normal operation
Local Drought Liaison Officer in Place				
Drought operation stage	1 (prolonged dry weather)	See specific islands	IoS Drought Group (twice weekly)	<ul style="list-style-type: none"> Community drought liaison officer in place (Enhanced media campaign – phase 1).
	2 (drought)	See specific islands	IoS Drought Group (daily)	<ul style="list-style-type: none"> Community drought support officers in place (enhanced media campaign phase 2). LRF liaison.
	3 (drought)	See specific islands	IoS Platinum Drought Group (daily- weekly)	<ul style="list-style-type: none"> Tailored island comms for NEUB impacts. Board level spokesperson for media.
Emergency operation Stage	4 (severe drought causing rota cuts)	See specific islands	IoS Platinum Drought Group/ Emergency operation	<ul style="list-style-type: none"> Emergency operation.

5.1.6.1 Management Framework- Normal Operation

The process is set out under St Mary's and will apply to all islands.

5.1.6.2 Management Framework- Drought Operation

The process is set out under St Mary's and will apply to all islands.

We would look to bring in Duchy of Cornwall representation from Level 2 if needed. This is to ensure the development of the plans is done in agreement with the local island community needs.

5.1.6.3 Drought Operation Management Agenda

The process is set out under St Mary's and will apply to all islands.

5.1.6.3 Emergency Operation

Under Level 4, emergency operation would be in place. The structure and format would be developed in the lead up to reflect the specific local island circumstances.

5.1.6.4 Community Communications Plan

We will adopt a traffic light system to communicate the Drought Risk on the islands. The purpose will be to:

- To be early and proactive,
- To be informative,
- To be clear on what we are doing to mitigate risks,
- To be clear on what is being asked of customers, retailers and stakeholders,
- To be flexible and agile to deal with a range of drought events,
- To treat all customers fairly and consistently,
- To tailor communications for each Island.

The key phases are:

- Normal operating phase: Traffic Light – Green

This phase will run an annual water efficiency media campaign each summer for awareness.

- Level 1 – media campaign: Traffic Light – Amber

This phase will initiate a media campaign calling on action is needed. It includes an ‘on island’ drought community officer to aide communication with the community on the situation.

- Level 2 – demand restrictions phase: Traffic Light – Amber (restrictions)

This phase will see temporary use bans in place. Drought community support offices will be in place on each island to support the communities.

- Level 3 – severe demand restrictions phase: Traffic Light – Red

This phase will see non-essential use bans in place. This will be managed through on island presence.

- Level 4 – Emergency operation (Traffic Light – Black)

This phase would invoke rota cuts. The communication in this phase would be developed for the specific event.

Full details of the activities in each phase is given in Appendix C.

5.1.7 Coming out of a Drought

As the Islands come out of the drought, we would operate the above process in reverse and gradually reduce the actions being taken to manage supply and demand.

5.1.8 Environmental assessment, monitoring and mitigation

Further monitoring is required to confirm whether there are any impacts of groundwater abstraction on environmentally designated areas on St Agnes, including Big Pool and Browart Point SSSI.

The effectiveness of the environmental assessment, monitoring programmes and mitigation measures is dependent on having suitable baseline monitoring networks in place. The monitoring requirement for St Agnes and the other islands is to be reviewed in consultation with the Environment Agency, Natural England, and the IoS Wildlife Trust. An appropriate monitoring programme will then be agreed with the Environment Agency for implementation by 31st March 2024 at the latest.

The draft drought plan will be updated with the relevant environmental assessments, monitoring programmes and proposed mitigation measures once agreement has been reached with the Environment Agency.

The SSSIs on the Isles of Scilly are either favourable condition or recovering. SWW are committed to ensuring no deterioration in the condition of the IoS SSSIs.

5.1.9 End of Drought

The end of the drought will be defined by demand dropping below the specified trigger threshold and GW level recovering above the trigger threshold for a sufficient period and combined with a favourable forecast of significant rainfall.

It is intended to undertake further detailed analysis linking rainfall, soil moisture deficit and groundwater levels through the development of conceptual groundwater model(s) for each island. The company intends to use a combination of rainfall, soil moisture deficit recovery together with forecast rainfall to inform its 'end of drought' predictions and will liaise with the Environment Agency to confirm the drought has ended before declaring it. The outputs of this work will be included in the updated IoS Appendix in 2024.

As with our mainland water supply areas, we will undertake a review of our Isles of Scilly Draft Drought Plan implementation within six months of the end of a drought (see main Drought Plan, Section 7). Given we have been responsible for water supply of the islands for only a limited time and our draft drought plan is untested, we would seek to update and improve our management learning from our experiences and the additional environmental and other data that would have been generated.

We would seek to work with the Environment Agency, local authorities and key stakeholders on the islands (e.g. Council of the Isles of Scilly, Duchy of Cornwall, Tresco Estates) to listen to any concerns or recommendations that they may have to ensure future droughts are managed to limit the impact on the population and the environment.

6.0 Tresco

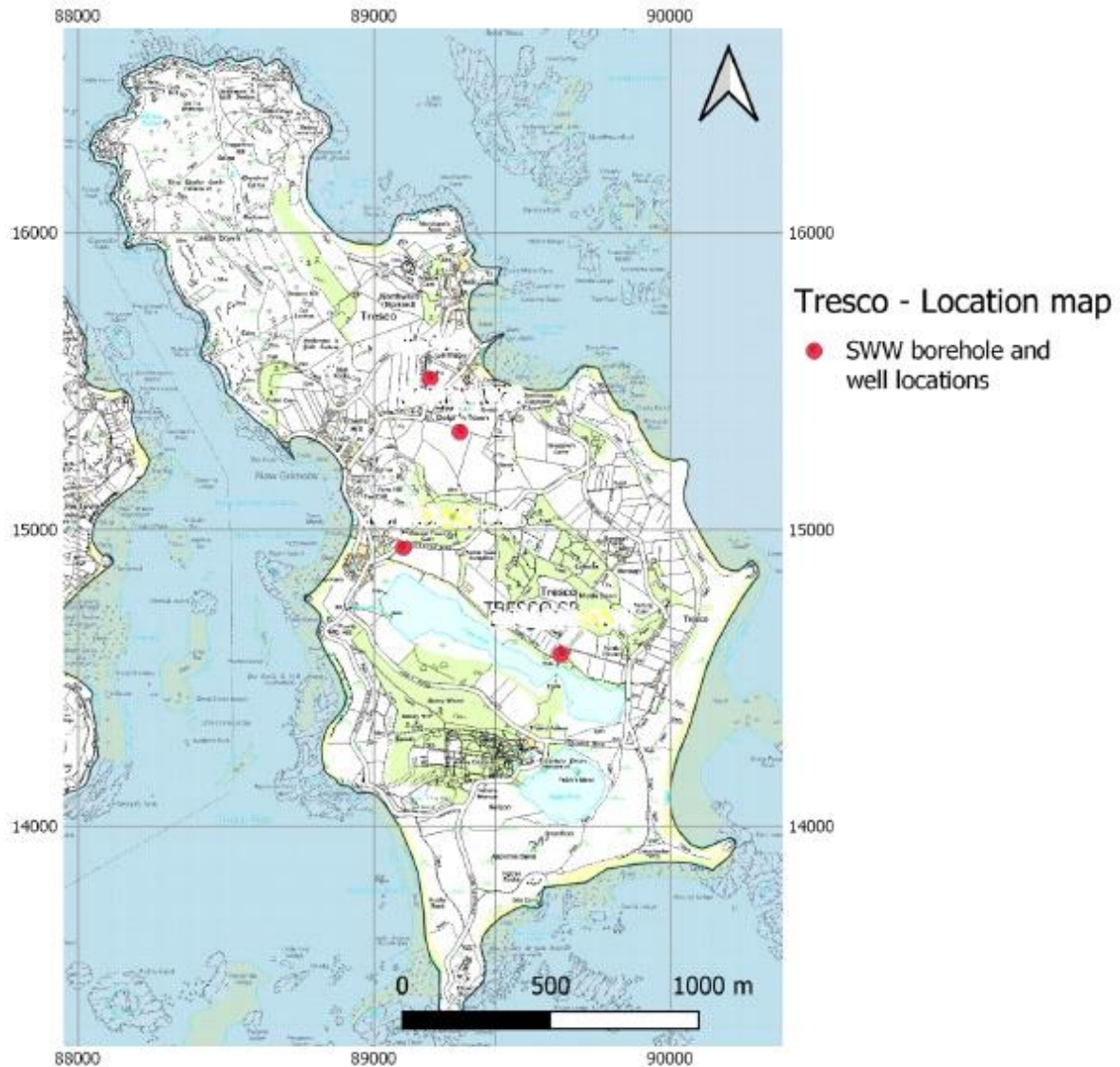
6.1 Tresco Draft Drought Plan

6.1.1 Background

Tresco is the second largest island with the second highest population (175 residents in 2011) and demand for water. The current water supplies are obtained from four groundwater sources (boreholes / wells) fed from two distinct catchment areas. The two groundwater sources on the southern half of the island are located adjacent to the environmentally designated area of Great Pool which has SSSI status. There is currently no desalination of seawater for public supply on Tresco.

The groundwater supply on Tresco comes from three large diameter wells (Ox's, Wellfield and Bridgefield) and one borehole (known as 'Borehole by lake'). Ox's and Wellfield wells lie within the Old Grimsby Harbour groundwater catchment to the north, while Bridgefield Well and Borehole by lake lie in the Tresco Great Pool catchment area, to the south. The location of these sources is shown in Figure 17.

Figure 17: Location of Tresco groundwater supply sources.



6.1.2 Drought Vulnerability

We have completed a provisional drought vulnerability assessment for the islands. This is provided in Appendix A. We have classified as **HIGH VULNERABILITY**. The key reasons for this are:

- The small surplus of supply capacity over demand in the summer months.
 - The limited storage in the main aquifer system and its reliance on regular recharge events.
 - No interconnectivity between the islands.
 - Lack of long-term source performance data.
 - Lack of support available from alternative, essentially mainland sources of supply
- Islands are classified as “Serious” under recent reclassification of water stressed regions in the UK.

6.1.3 Drought triggers

In this Section we set out the triggers that we will use to manage water resources in a drought and how we have tested them against the prolonged dry period and high demands of 2018 and a more severe event similar to the summer of 1976.

We have derived a series of drought triggers based on a combination of groundwater levels and demand severity, as well as considering meteorological conditions e.g. rainfall and temperature. The triggers are used to identify different severities of drought (levels 1 to 4) following the approach outlined in the EA guidelines.

We will use these drought triggers to identify when we should consider implementing specific drought actions to reduce demand and, if necessary, to obtain extra water resources.

The existing drought triggers will be reviewed and any revisions included in the updated Drought Plan in December 2024. It is intended that where possible the revised drought triggers will be island specific and based on any additional data and information that can be obtained, including that provided by the proposed monitoring programme.

6.1.3.1 Tresco drought triggers

The drought triggers for Tresco utilise a combination of groundwater level stress curves and demand curves as detailed in Figure's 18 & 19 below.

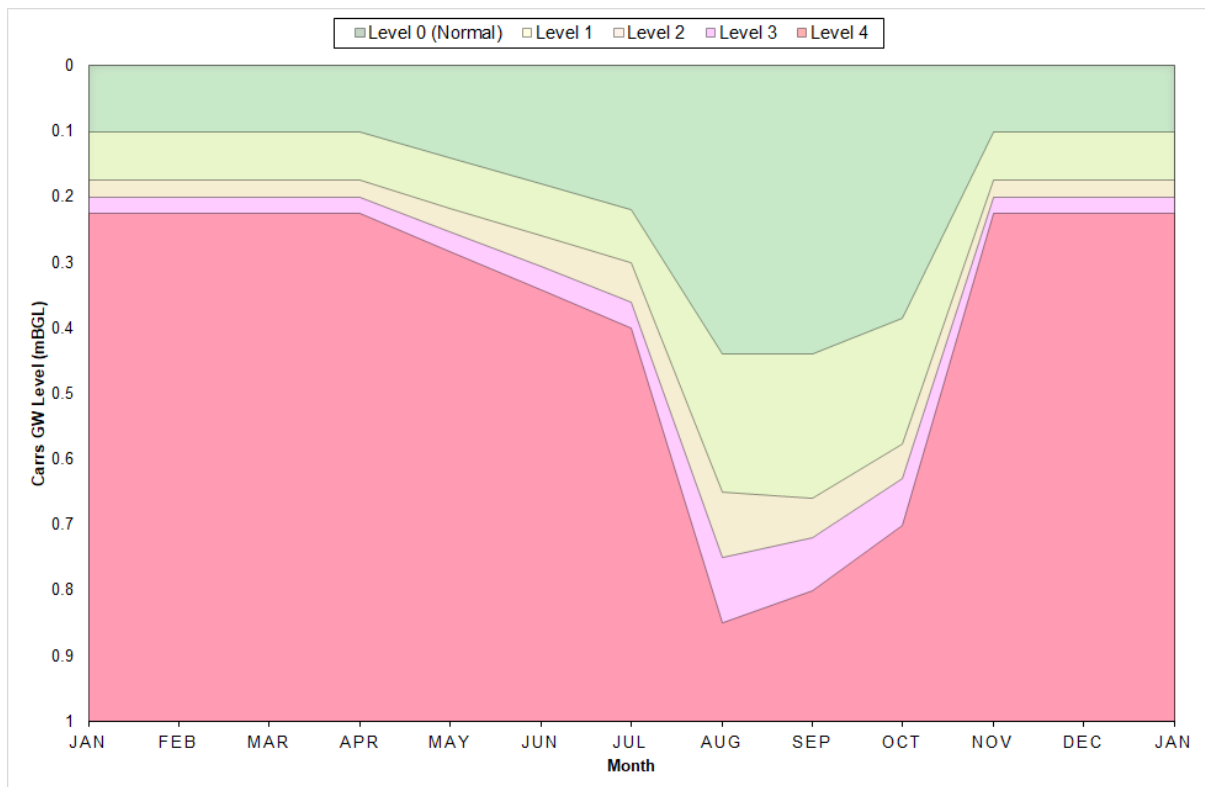
It is notable that the supply-demand situation (i.e. the balance between the water resource available for supply and the amount of water used on the island) on Tresco appears to be more resilient under dry weather conditions than that on other islands.

6.1.3.2 Groundwater triggers

The Tresco groundwater triggers are currently based on the groundwater level stress curves derived for St Mary's due to the lack of a suitable observation borehole. Island specific groundwater level stress curves for Tresco will be derived once a suitable observation borehole has either been identified or a new borehole drilled.

The St Mary's drought trigger assessment is based on groundwater levels in Carrs Well, which is located adjacent to the Higher Moors wetland area on St Mary's. The drought curves identify different drought severities. Due to the similar underlying hydrogeology and weather conditions experienced on both islands the St Mary's drought curve is expected to provide a reasonable first approximation of groundwater triggered drought conditions on Tresco. Using the St Mary's groundwater drought curve as a trigger is therefore likely to offer a relatively conservative approach until such time as island specific triggers are available.

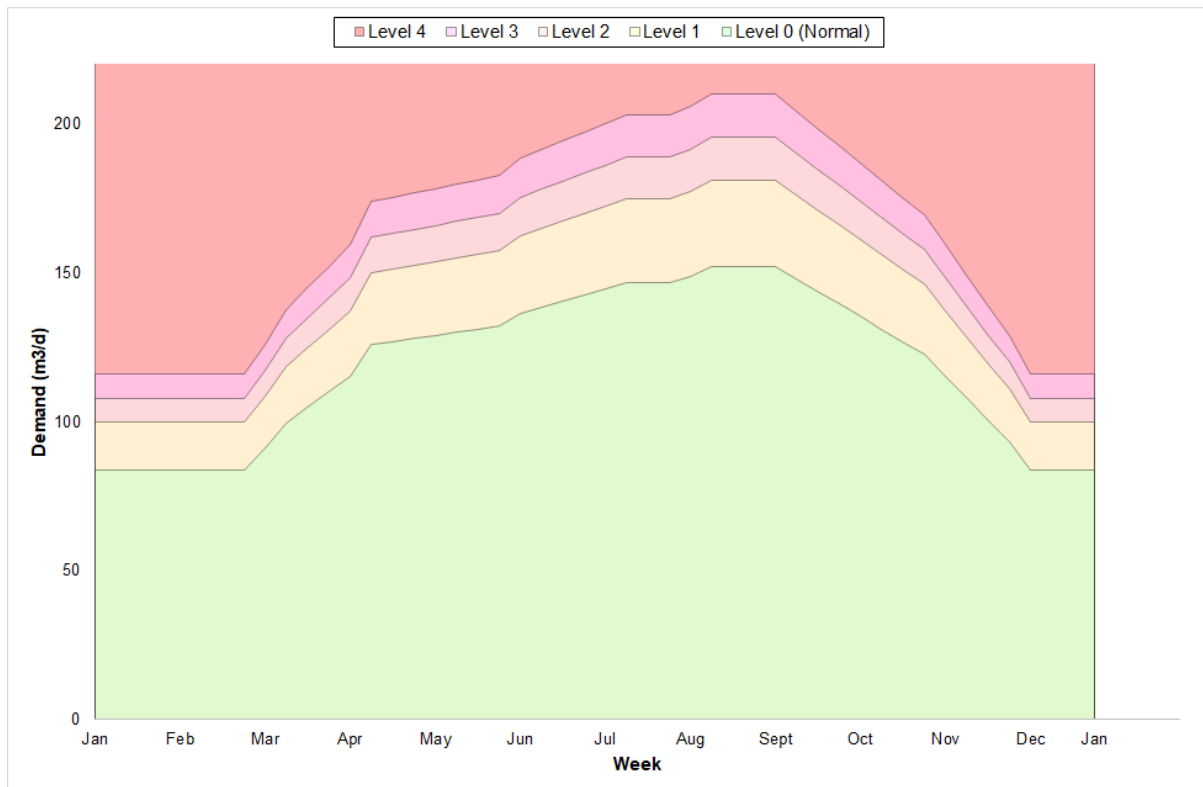
Figure 18: St Mary's environmental trigger curve used for Tresco (based on Carrs Well, St Mary's)



6.1.3.3 Demand triggers

The demand triggers (Figure 19) have been derived using the recently available demand data for Tresco with particular focus on annual demand profiles and key periods of high demand. These include Easter, the annual Gig Boat Racing Championships, August Bank Holiday and October Half term.

Figure 19: Tresco demand trigger curve



6.1.3.4 Additional environmental drought triggers

In addition to groundwater and demand levels, other criteria will be considered in assessing the drought severity level, such as rainfall and stream flow. These will be used to inform our response as a drought develops and the actions that we may wish to put in place.

These are listed St Mary's in the technical appendix (Appendix B).

6.1.3.5 Testing our drought triggers

We tested our drought triggers against the 2018 dry weather event to check their appropriateness for an event for which we have data and recent operational experience.

During the 2018 event groundwater levels reached the Level 1 Trigger threshold as shown in Figure 20 below, whilst demands peaked in the first week of May. An enhanced communications campaign was eventually implemented throughout July and August which saw repeated media messaging. The media campaign was effective in constraining demand (see Figure 21) and was followed by a change to wetter weather. These factors prevented the event from passing the Level 2 Trigger threshold. We are confident that our overall approach and the triggers is appropriate for this current version of the draft Drought Plan.

Figure 20: St Mary's Drought curve - 2018 event used for Tresco

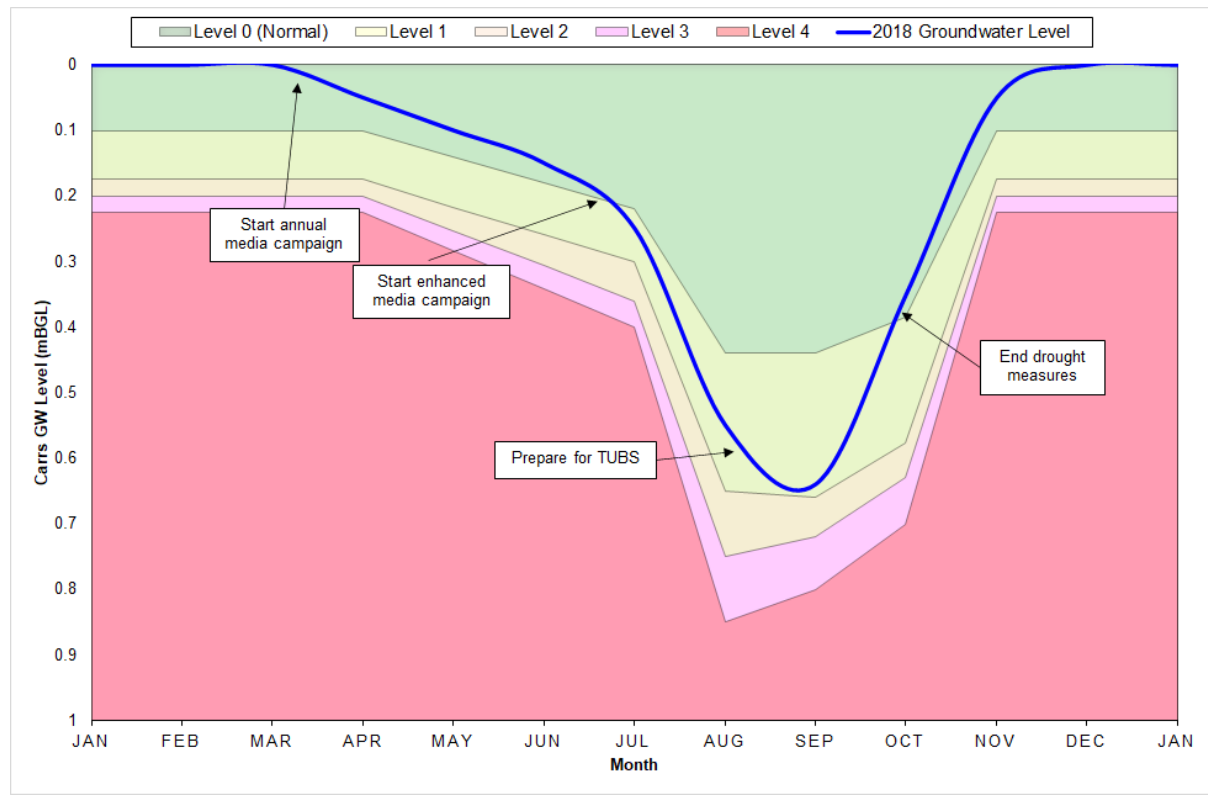
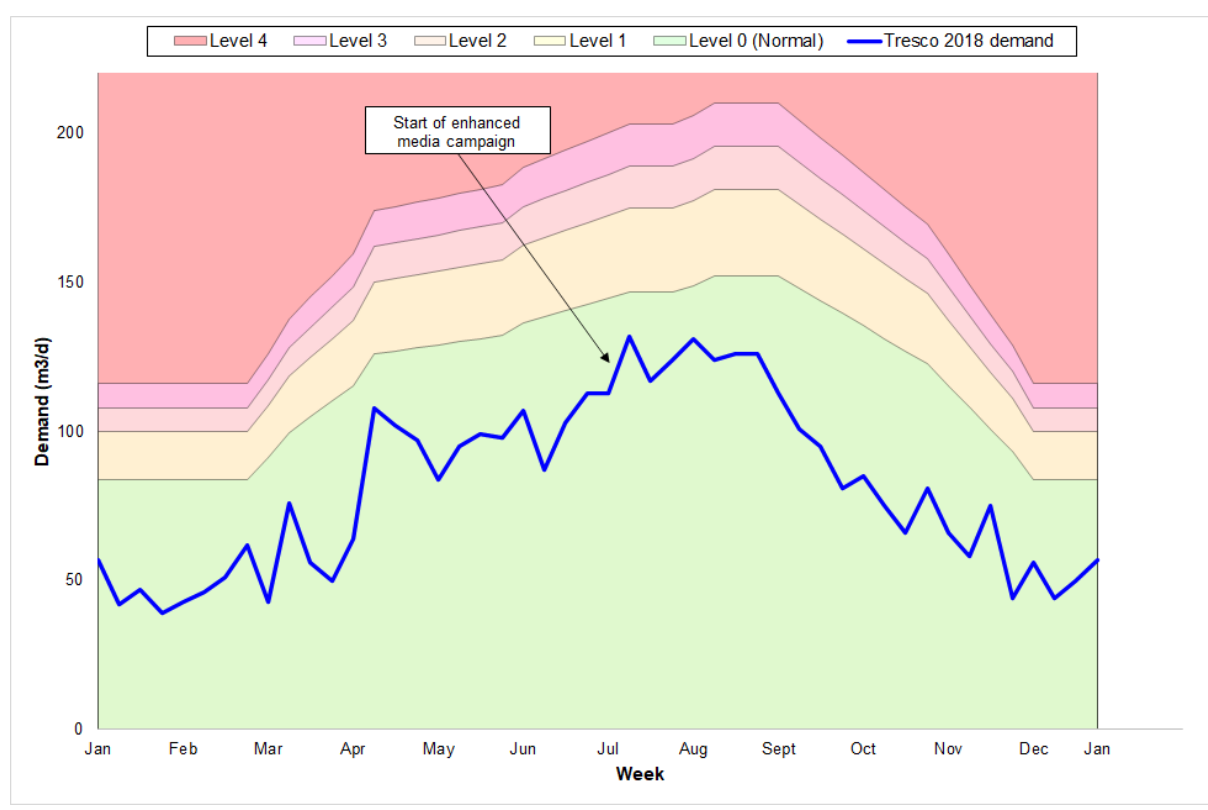


Figure 21: Tresco Demand curve - 2018 event.



An enhanced communications campaign was eventually implemented across the islands throughout July and August which saw repeated, increasingly strongly worded media messaging. The media campaign was effective in constraining demand (see Figure 21) leading to a plateauing in demand in late July/early August, which was then followed by a change to wetter weather in mid-August. The impact is perhaps less significant on Tresco as the island wasn't considered to be under as significant water stress as the other islands. There also remains significant uncertainty around the granularity of seasonal demands and the impact of drought mitigation measures on the islands due to a lack of detailed data/information.

6.1.4 Drought actions

Table 8 below provides a summary of possible drought actions we may adopt as drought severity increases. Demand actions will be implemented ahead of supply actions at the same drought level whenever appropriate to do so.

As a Drought develops, we would look to work with the Environment Agency and local community to adapt the options for local knowledge and need to achieve the least impact on the community and the environment.

Table 8: Isles of Scilly Tresco drought action summary

Severity of the drought	Drought Severity Level	Demand side actions	Supply side actions
Normal operating	Level 0	Annual media campaign (see comms plan)	
Drought Operation - prolonged dry weather	Level 1	<ul style="list-style-type: none"> Discussion with large commercial customer re timing of highest water use to avoid peak demand periods. Community Drought Liaison Officer (Enhanced media campaign Phase 1). Preparation 4 weeks before Level 1, plus 1 week for implementation. <ul style="list-style-type: none"> Increased leakage control. Implementation approx. 4 to 8 weeks <ul style="list-style-type: none"> Enhanced pressure management. Implementation approx. 1 to 4 weeks 	Drought actions with minor environmental impacts: <ul style="list-style-type: none"> optimising sources outage minimisation
Drought Operation - drought	Level 2	<ul style="list-style-type: none"> Temporary use bans. Advertising time and period for representations (see Section 3.3.1 of main Drought Plan) Typically, the preparation would start 4-6 weeks prior to implementation.	Drought actions with minor environmental impacts: <ul style="list-style-type: none"> 'Tankering' – provision of bowsers to strategic locations on the islands to support/supplement existing network e.g. to overcome

		<p>Advertised 1 week before implementation.</p> <ul style="list-style-type: none"> Community Drought Support officer (Enhanced media campaign Phase 2). 	<p>constraints in the current distribution network.</p> <ul style="list-style-type: none"> Increase storage capacity with temp storage tanks/reservoirs (above ground).
	Level 3	<ul style="list-style-type: none"> Non-essential use bans <p>Advertising time and period for representations</p> <p>Typically, the preparation would start 4-6 weeks prior to implementation.</p> <p>Advertised 1 week before implementation.</p> <p>All possible actions to avoid emergency drought orders</p>	<ul style="list-style-type: none"> Approach 3rd party resource owners to identify potential spare water availability. Further Level 3 supply options to be determined following further data collation and analysis.

Notes:

- i) Whilst each of the demand/supply side options are considered to save/provide additional water, exact savings/yields are the subject of further investigation and will be confirmed in the updated IoS Appendix in 2024.
- ii) The availability of 'additional/spare' water for 'tankering' to support other islands will be further assessed and inform the updated IoS Appendix in 2024).
- iii) Third party resource owners will be approached in 2022/23 as part of the implementation of the monitoring programme. SWW also plans to liaise with CloS to further explore the availability of additional information regarding 3rd party resource owners.

6.1.5 Extreme drought management actions

In an extreme drought we may consider the following 'extreme drought actions' in addition to those already implemented in Levels 1-3 (see Section 6.1.4):

Demand Side:

- Blitz/aggressive media campaign
- Free water saving devices to commercial and domestic customers
- Reduced water consumption by large commercial customers
- Liaison with CloS & tourist boards to support them in making informed decisions about how they manage increased demand from incoming tourists to the island.

Supply side:

- Importing additional spare water from other islands (the availability of 'additional/spare' water will be further assessed and inform the updated IoS Appendix in 2024).
- Bringing in bottled water supplies from mainland.
- Temporary desalination.

6.1.6 Management Structure and Community Communications Plan

Management and communication are vital in a Drought. Our approach follows the overall structure of the mainland Drought Plan, Section 5 but has been tailored for the unique operating environment of the Islands.

We will liaise closely with the Environment Agency and other key stakeholders (e.g. CloS) at an early stage (approaching Level 1) and throughout the developing drought.

Specifically, the communication plan uses 'on island' liaison staff to work with the community. This is so it can tailor to the local communities which are much smaller than the mainland. Table 9 summarises the approach.

Table 9: Overview of management structure and communications plan

Drought Severity Stage	Level	Supply/Demand Actions	Drought Management - leading group	Community Communications plan
Normal operation stage	0	Actions as per drought triggers	Isles of Scilly Steering Group	<ul style="list-style-type: none"> Normal operation
Local Drought Liaison Officer in Place				
Drought operation stage	1 (prolonged dry weather)	See specific islands	IoS Drought Group (twice weekly)	<ul style="list-style-type: none"> Community drought liaison officer in place (Enhanced media campaign – phase 1).
	2 (drought)	See specific islands	IoS Drought Group (daily)	<ul style="list-style-type: none"> Community drought support officers in place (enhanced media campaign phase 2). LRF liaison.
	3 (drought)	See specific islands	IoS Platinum Drought Group (daily- weekly)	<ul style="list-style-type: none"> Tailored island comms for NEUB impacts. Board level spokesperson for media.
Emergency operation Stage	4 (severe drought causing rota cuts)	See specific islands	IoS Platinum Drought Group/ Emergency operation	<ul style="list-style-type: none"> Emergency operation.

6.1.6.1 Management Framework- Normal Operation

The process is set out under St Mary's and will apply to all islands.

6.1.6.2 Management Framework- Drought Operation

The process is set out under St Mary's and will apply to all islands.

We would look to bring Tresco Estates representation into the structure if needed from Level 2.

6.1.6.3 Drought Operation Management Agenda

The process is set out under St Mary's and will apply to all islands.

6.1.6.3 Emergency Operation

Under Level 4, emergency operation would be in place. The structure and format would be developed in the lead up to reflect the specific local island circumstances.

6.1.6.4 Community Communications Plan

We will adopt a traffic light system to communicate the Drought Risk on the islands. The purpose will be to:

- To be early and proactive,
- To be informative,
- To be clear on what we are doing to mitigate risks,
- To be clear on what is being asked of customers, retailers and stakeholders,
- To be flexible and agile to deal with a range of drought events,
- To treat all customers fairly and consistently,
- To tailor communications for each Island.

The key phases are:

- Normal operating phase: Traffic Light – Green

This phase will run an annual water efficiency media campaign each summer for awareness.

- Level 1 – media campaign: Traffic Light – Amber

This phase will initiate a media campaign calling on action is needed. It includes an 'on island' drought community officer to aide communication with the community on the situation.

- Level 2 – demand restrictions phase: Traffic Light – Amber (restrictions)

This phase will see temporary use bans in place. Drought community support offices will be in place on each island to support the communities.

- Level 3 – severe demand restrictions phase: Traffic Light – Red

This phase will see non-essential use bans in place. This will be managed through on island presence.

- Level 4 – Emergency operation (Traffic Light – Black)

This phase would invoke rota cuts. The communication in this phase would be developed for the specific event.

Full details of the activities in each phase is given in Appendix C.

6.1.7 Coming out of a Drought

As the Islands come out of the drought, we would operate the above process in reverse and gradually reduce the actions being taken to manage supply and demand.

6.1.8 Environmental assessment, monitoring and mitigation

Tresco Great Pool is the only environmentally designated area on Tresco potentially impacted by groundwater abstraction. Natural England assessed this area to be in “favourable condition” (the highest category). The proposed monitoring plan includes surface and groundwater water level measurements to allow the assessment of impacts from abstraction in the Great Pool catchment, including the potential impact on water levels in the Great Pool SSSI and Abbey Pool.

The effectiveness of the environmental assessment, monitoring programmes and mitigation measures is dependent on having suitable baseline monitoring networks in place. The monitoring requirement for Tresco and the other islands is to be reviewed in consultation with the Environment Agency, Natural England, and the IoS Wildlife Trust. An appropriate monitoring programme will then be agreed with the Environment Agency for implementation by 31st March 2024 at the latest.

The draft drought plan will be updated with the relevant environmental assessments, monitoring programmes and proposed mitigation measures once agreement has been reached with the Environment Agency.

The SSSIs on the Isles of Scilly are either favourable condition or recovering. SWW are committed to ensuring no deterioration in the condition of the IoS SSSIs.

6.1.9 End of Drought

The end of the drought will be defined by demand dropping below the specified trigger threshold and GW level recovering above the trigger threshold for a sufficient period and combined with a favourable forecast of significant rainfall.

It is intended to undertake further detailed analysis linking rainfall, soil moisture deficit and groundwater levels through the development of conceptual groundwater model(s) for each island. The company intends to use a combination of rainfall, soil moisture deficit recovery together with forecast rainfall to inform its ‘end of drought’ predictions and will liaise with the Environment Agency to confirm the drought has ended before declaring it. The outputs of this work will be included in the updated IoS Appendix in 2024.

As with our mainland water supply areas, we will undertake a review of our Isles of Scilly Drought Plan implementation within six months of the end of a drought (see main Drought Plan, Section 7). Given we have been responsible for water supply of the islands for only a limited time and our draft drought plan is untested, we would seek to update and improve our management learning from our experiences and the additional environmental and other data that would have been generated.

We would seek to work with the Environment Agency, local authorities and key stakeholders on the islands (e.g. Council of the Isles of Scilly, Duchy of Cornwall, Tresco Estates) to listen to any concerns or recommendations that they may have to ensure future droughts are managed to limit the impact on the population and the environment.

7.0 Bryher

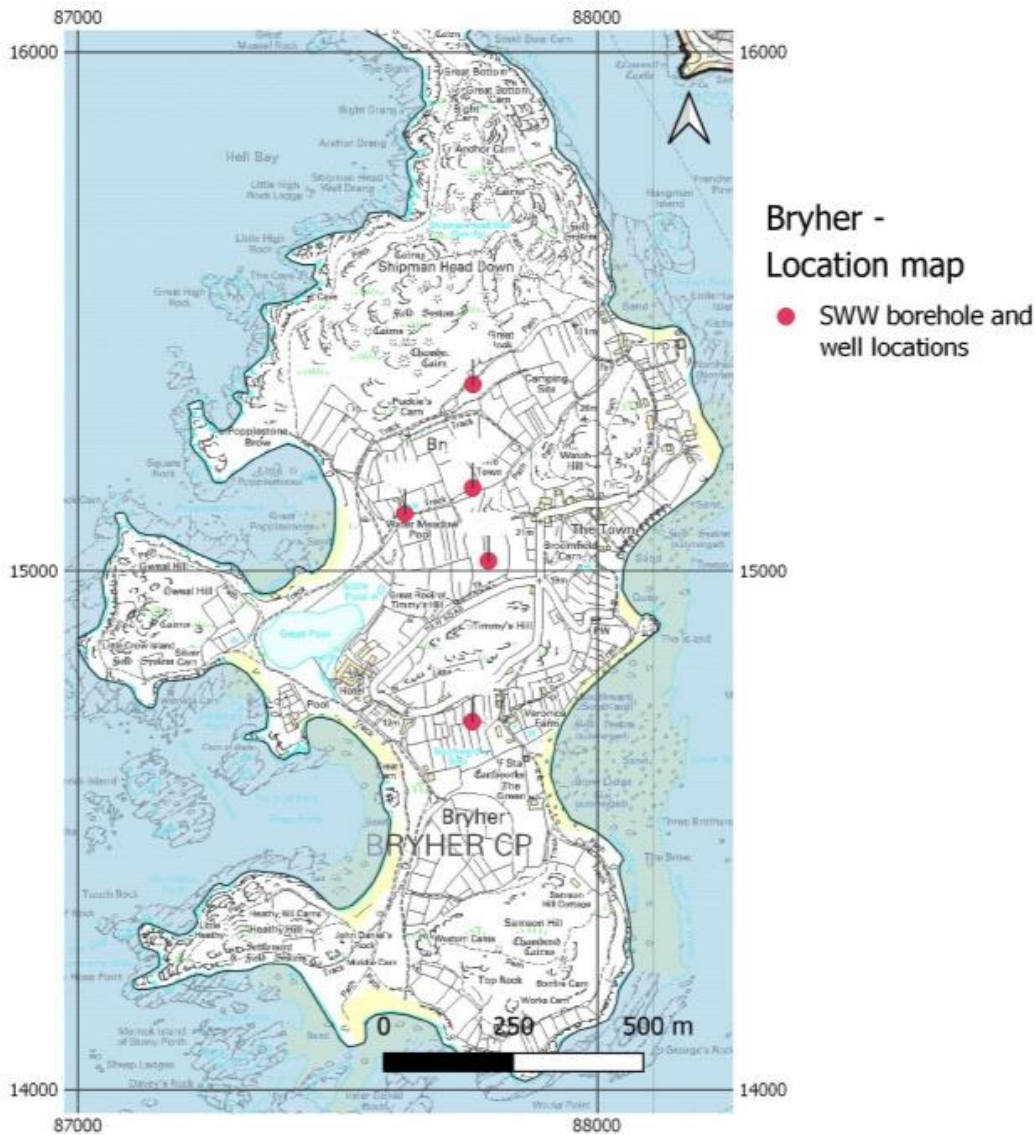
7.1 Bryher Draft Drought Plan

7.1.1 Background

Bryher is the smallest inhabited island by area with a resident population (84 residents in 2011) similar to St Agnes. The current water supplies are obtained from five groundwater sources (four boreholes and a well) fed from two distinct catchment areas. All the groundwater is treated by a small reverse osmosis (RO) desalination plant to mitigate the risk of relatively high salinity. Four of the groundwater sources on Bryher are located within the same catchment as the Pool of Bryher (aka Great Pool), which has SSSI status.

The groundwater supply on St Mary's comes from four small diameter boreholes (BH1-BH4) and a large diameter well (known as Well)). BH1, BH2, BH4 and Well 2 lie within the Pool of Bryher groundwater catchment, while BH3 is located to the south which drains to Green Bay. The location of these sources is shown in Figure 22.

Figure 22: Location of Bryher groundwater supply sources.



7.1.2 Drought Vulnerability

We have completed a provisional drought vulnerability assessment for the islands. This is provided in Appendix A. We have classified as **HIGH VULNERABILITY**. The key reasons for this are:

- The small surplus of supply capacity over demand in the summer months.
 - The limited storage in the main aquifer system and its reliance on regular recharge events.
 - No interconnectivity between the islands.
 - Lack of long-term source performance data.
 - Lack of support available from alternative, essentially mainland sources of supply
- Islands are classified as “Serious” under recent reclassification of water stressed regions in the UK.

7.1.3 Drought triggers

In this Section we set out the triggers that we will use to manage water resources in a drought and how we have tested them against the prolonged dry period and high demands of 2018 and a more severe event similar to the summer of 1976.

We have derived a series of drought triggers based on a combination of groundwater levels and demand severity, as well as considering meteorological conditions e.g. rainfall and temperature. The triggers are used to identify different severities of drought (levels 1 to 4) following the approach outlined in the EA guidelines.

We will use these drought triggers to identify when we should consider implementing specific drought actions to reduce demand and, if necessary, to obtain extra water resources.

The existing drought triggers will be reviewed and any revisions included in the updated Drought Plan in December 2024. It is intended that where possible the revised drought triggers will be island specific and based on any additional data and information that can be obtained, including that provided by the proposed monitoring programme.

7.1.3.1 Bryher drought triggers

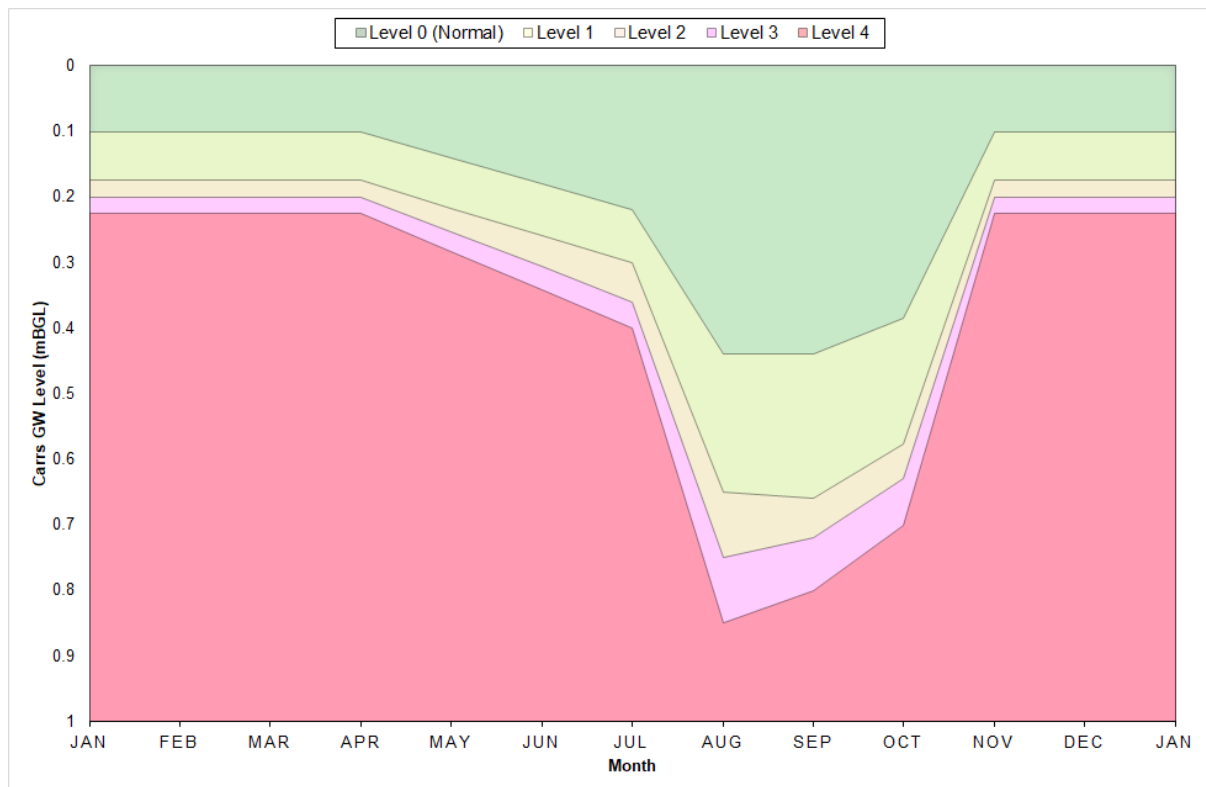
The drought triggers for Bryher utilise a combination of groundwater level stress curves and demand curves as detailed in Figure's 23 & 24 below.

7.1.3.2 Groundwater triggers

The Bryher groundwater triggers are currently based on the groundwater level stress curves derived for St Mary's due to the lack of a suitable observation borehole. Island specific groundwater level stress curves for Bryher will be derived once a suitable observation borehole has either been identified or a new borehole drilled.

The St Mary's drought trigger assessment is based on groundwater levels in Carrs Well, which is located adjacent to the Higher Moors wetland area on St Mary's. The drought curves identify different drought severities. Due to the similar underlying hydrogeology and weather conditions experienced on both islands the St Mary's drought curve is expected to provide a reasonable first approximation of groundwater triggered drought conditions on Bryher.

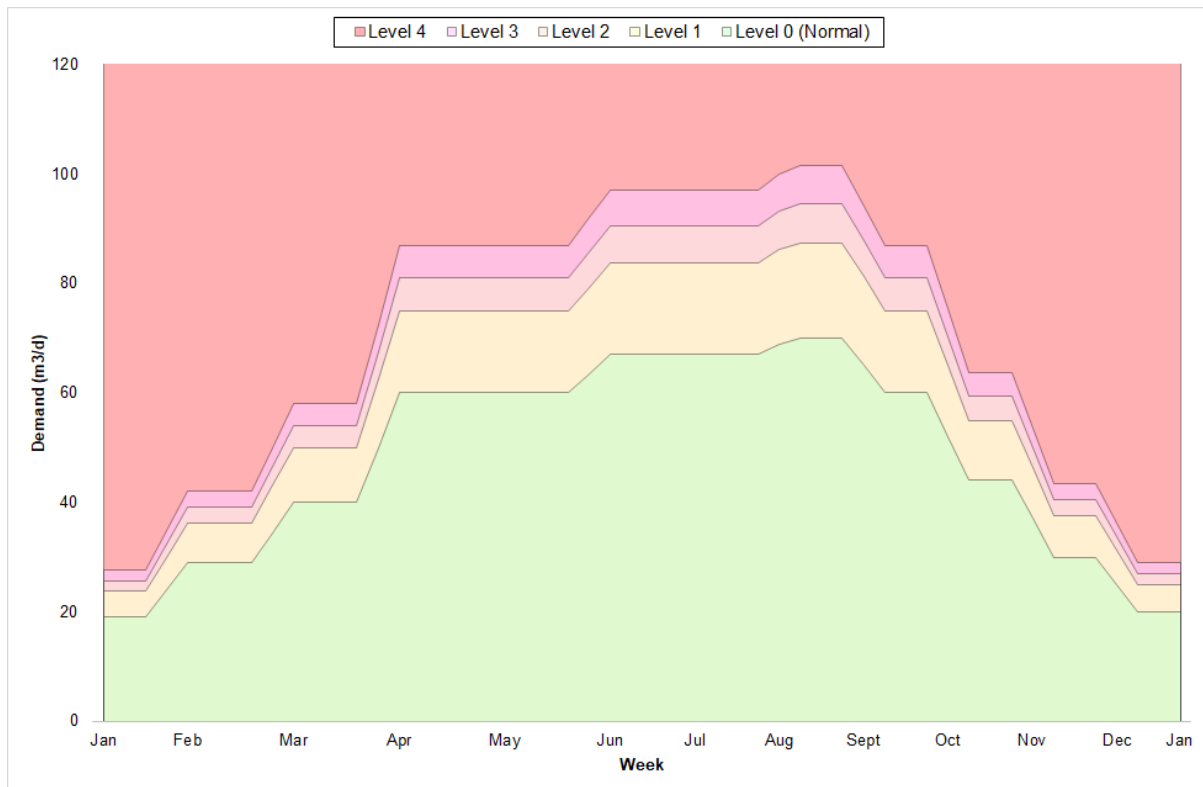
Figure 23: St Mary's environmental trigger curve used for Bryher (based on Carrs Well, St Mary's)



7.1.3.3 Demand triggers

The demand triggers (Figure 24) have been derived using the recently available demand data for Bryher with particular focus on annual demand profiles and key periods of high demand. These include Easter, the annual Gig Boat Racing Championships, August Bank Holiday and October Half term.

Figure 24: Bryher demand trigger curve



NB: Bryher demand curve as shown is post-desalination. The wastewater stream from the RO (reverse osmosis) plant accounts for up to 60% of the total groundwater abstraction.

7.1.3.4 Additional environmental drought triggers

In addition to groundwater and demand levels, other criteria will be considered in assessing the drought severity level, such as rainfall and stream flow. These will be used to inform our response as a drought develops and the actions that we may wish to put in place.

These are listed for St Mary's in the technical appendix (Appendix B).

7.1.3.5 Testing our drought triggers

We tested our drought triggers against the 2018 dry weather event to check their appropriateness for an event for which we have data and recent operational experience.

During the 2018 event groundwater levels reached the Level 1 Trigger threshold as shown in Figure 25 below, whilst demands peaked in the last week of May. An enhanced communications campaign was eventually implemented throughout July and August which saw repeated media messaging. The media campaign was effective in constraining demand (see Figure 26) and was followed by a change to wetter weather. These factors prevented the event from passing the Level 2 Trigger threshold. We are confident that our overall approach and the triggers is appropriate for this current version of the draft Drought Plan.

Figure 25: St Mary's Drought curve - 2018 event used for Bryher

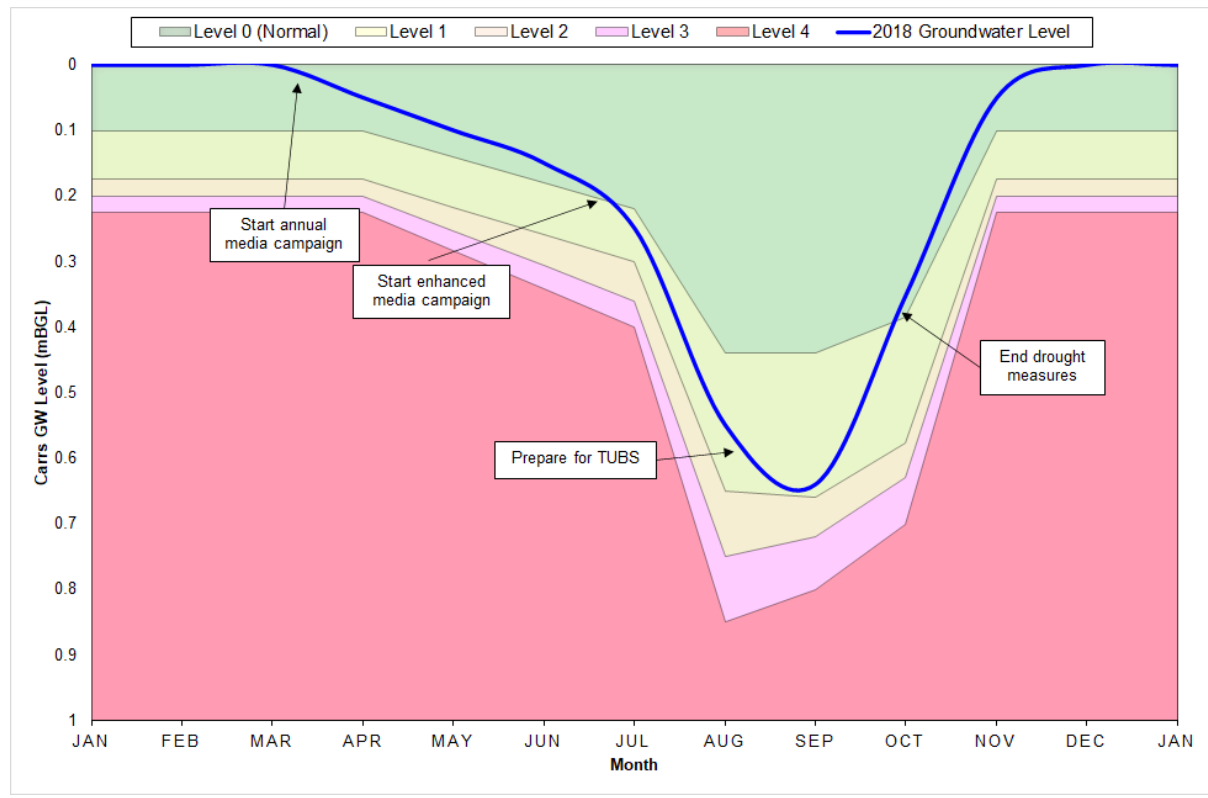
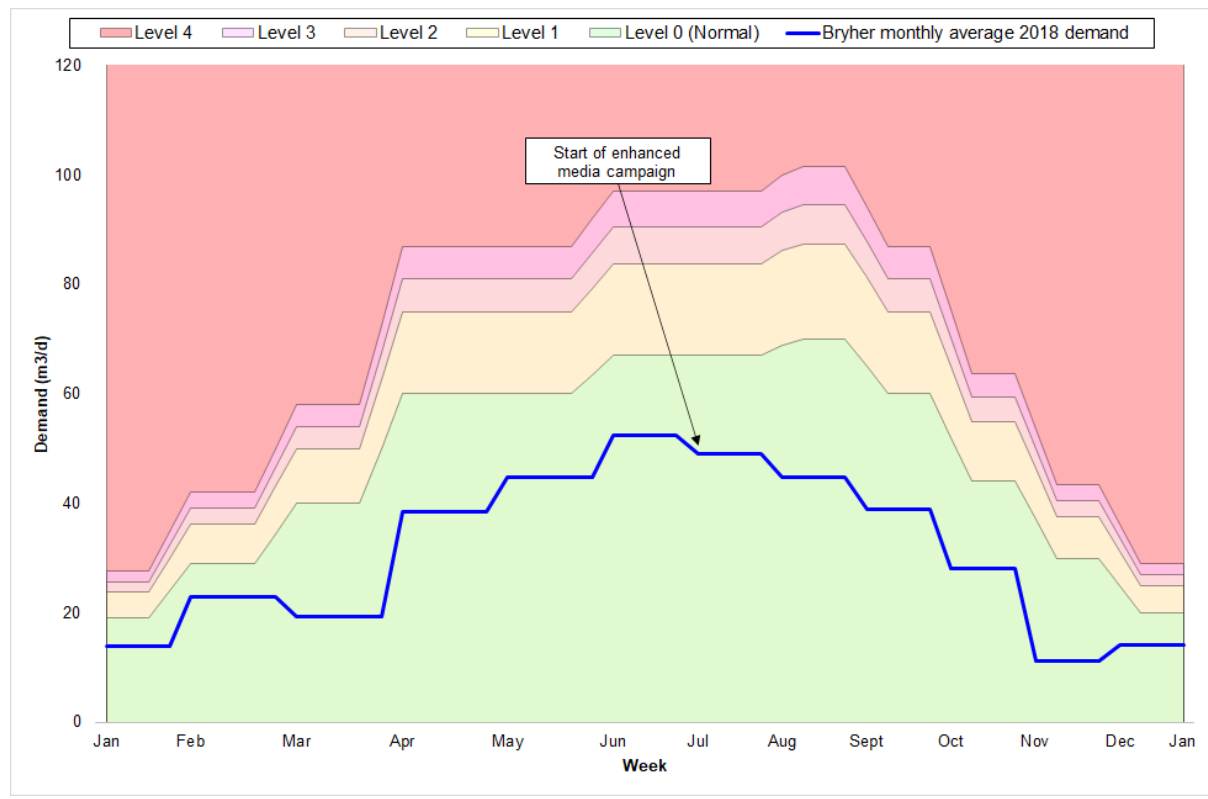


Figure 26: Bryher Demand curve - 2018 event.



7.1.4 Drought actions

Table 10 below provides a summary of possible drought actions we may adopt as drought severity increases. Demand actions will be implemented ahead of supply actions at the same drought level whenever appropriate to do so.

As a Drought develops, we would look to work with the Environment Agency and local community to adapt the options for local knowledge and need to achieve the least impact on the community and the environment.

Table 10: Isles of Scilly Bryher drought action summary

Severity of the drought	Drought Severity Level	Demand side actions	Supply side actions
Normal operating	Level 0	Annual media campaign (see comms plan)	
Drought Operation - prolonged dry weather	Level 1	<ul style="list-style-type: none"> Discussion with large commercial customer re timing of highest water use to avoid peak demand periods. Community Drought Liaison Officer (Enhanced media campaign Phase 1). <p>Preparation 4 weeks before Level 1, plus 1 week for implementation.</p> <ul style="list-style-type: none"> Increased leakage control. <p>Implementation approx. 4 to 8 weeks</p> <ul style="list-style-type: none"> Enhanced pressure management. Implementation approx. 1 to 4 weeks 	<p>Drought actions with minor environmental impacts:</p> <ul style="list-style-type: none"> optimising sources outage minimisation
Drought Operation - drought	Level 2	<ul style="list-style-type: none"> Temporary use bans. <p>Advertising time and period for representations (see Section 3.3.1 of main Drought Plan)</p> <p>Typically, the preparation would start 4-6 weeks prior to implementation.</p> <p>Advertised 1 week before implementation.</p> <ul style="list-style-type: none"> Community Drought Support officer (Enhanced media campaign Phase 2). 	<p>Drought actions with minor environmental impacts:</p> <ul style="list-style-type: none"> 'Tankering' – provision of bowsers to strategic locations on the islands to support/supplement existing network e.g. to overcome constraints in the current distribution network. Increase storage capacity with temp storage tanks/reservoirs (above ground).

	Level 3	<ul style="list-style-type: none"> Non-essential use bans <p>Advertising time and period for representations</p> <p>Typically, the preparation would start 4-6 weeks prior to implementation.</p> <p>Advertised 1 week before implementation.</p> <p>All possible actions to avoid emergency drought orders</p>	<ul style="list-style-type: none"> Approach 3rd party resource owners to identify potential spare water availability. Further Level 3 supply options to be determined following further data collation and analysis.
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Notes:

- i) Whilst each of the demand/supply side options are considered to save/provide additional water, exact savings/yields are the subject of further investigation and will be confirmed in the updated IoS Appendix in 2024.
- ii) The availability of 'additional/spare' water for 'tankering' to support other islands will be further assessed and inform the updated IoS Appendix in 2024).
- iii) Third party resource owners will be approached in 2022/23 as part of the implementation of the monitoring programme. SWW also plans to liaise with CloS to further explore the availability of additional information regarding 3rd party resource owners.

7.1.5 Extreme drought management actions

In an extreme drought we may consider the following 'extreme drought actions' in addition to those already implemented in Levels 1-3 (see Section 7.1.4):

Demand Side:

- Blitz/aggressive media campaign
- Free water saving devices to commercial and domestic customers
- Reduced water consumption by large commercial customers
- Liaison with CloS & tourist boards to support them in making informed decisions about how they manage increased demand from incoming tourists to the island.

Supply side:

- Importing additional spare water from Tresco or other islands (the availability of 'additional/spare' water will be further assessed and inform the updated IoS Appendix in 2024).
- Bringing in bottled water supplies from mainland.
- Further optimisation of groundwater and desalination blend to allow increase output.
- Temporary desalination.

7.1.6 Management Structure and Community Communications Plan

Management and communication are vital in a Drought. Our approach follows the overall structure of the mainland Drought Plan, Section 5, but has been tailored for the unique operating environment of the Islands.

We will liaise closely with the Environment Agency and other key stakeholders (e.g. CloS) at an early stage (approaching Level 1) and throughout the developing drought.

Specifically, the communication plan uses ‘on island’ liaison staff to work with the community. This is so it can tailor to the local communities which are much smaller than the mainland. Table 10 summarises the approach.

Table 10: Overview of management structure and communications plan

Drought Severity Stage	Level	Supply/Demand Actions	Drought Management - leading group	Community Communications plan
Normal operation stage	0	Actions as per drought triggers	Isles of Scilly Steering Group	<ul style="list-style-type: none"> Normal operation
Local Drought Liaison Officer in Place				
Drought operation stage	1 (prolonged dry weather)	See specific islands	IoS Drought Group (twice weekly)	<ul style="list-style-type: none"> Community drought liaison officer in place (Enhanced media campaign – phase 1).
	2 (drought)	See specific islands	IoS Drought Group (daily)	<ul style="list-style-type: none"> Community drought support officers in place (enhanced media campaign phase 2). LRF liaison.
	3 (drought)	See specific islands	IoS Platinum Drought Group (daily- weekly)	<ul style="list-style-type: none"> Tailored island comms for NEUB impacts. Board level spokesperson for media.
Emergency operation Stage	4 (severe drought causing rota cuts)	See specific islands	IoS Platinum Drought Group/ Emergency operation	<ul style="list-style-type: none"> Emergency operation.

7.1.6.1 Management Framework- Normal Operation

The process is set out under St Mary’s and will apply to all islands.

7.1.6.2 Management Framework- Drought Operation

The process is set out under St Mary’s and will apply to all islands.

We would look to bring in Duchy of Cornwall representation from Level 2 if needed. This is to ensure the development of the plans is done in agreement with the local island community needs.

7.1.6.3 Drought Operation Management Agenda

The process is set out under St Mary’s and will apply to all islands.

7.1.6.3 Emergency Operation

Under Level 4, emergency operation would be in place. The structure and format would be developed in the lead up to reflect the specific local island circumstances.

7.1.6.4 Community Communications Plan

We will adopt a traffic light system to communicate the Drought Risk on the islands. The purpose will be to:

- To be early and proactive,
- To be informative,
- To be clear on what we are doing to mitigate risks,
- To be clear on what is being asked of customers, retailers and stakeholders,
- To be flexible and agile to deal with a range of drought events,
- To treat all customers fairly and consistently,
- To tailor communications for each Island.

The key phases are:

- Normal operating phase: Traffic Light – Green

This phase will run an annual water efficiency media campaign each summer for awareness.

- Level 1 – media campaign: Traffic Light – Amber

This phase will initiate a media campaign calling on action is needed. It includes an ‘on island’ drought community officer to aide communication with the community on the situation.

- Level 2 – demand restrictions phase: Traffic Light – Amber (restrictions)

This phase will see temporary use bans in place. Drought community support offices will be in place on each island to support the communities.

- Level 3 – severe demand restrictions phase: Traffic Light – Red

This phase will see non-essential use bans in place. This will be managed through on island presence.

- Level 4 – Emergency operation (Traffic Light – Black)

This phase would invoke rota cuts. The communication in this phase would be developed for the specific event.

Full details of the activities in each phase are given in Appendix C.

7.1.7 Coming out of a Drought

As the Islands come out of the drought, we would operate the above process in reverse and gradually reduce the actions being taken to manage supply and demand.

7.1.8 Environmental assessment, monitoring and mitigation

The Pool of Bryher & Popplestone Bank SSSI is the only environmentally designated area on Bryher potentially impacted by groundwater abstraction. Natural England assessed this area to be in “favourable condition” (the highest category). The proposed monitoring plan includes surface and groundwater water level measurements to allow the assessment of impacts from abstraction in the Pool of Bryher catchment, including the potential impact on water levels in the Pool of Bryher & Popplestone Bank SSSI.

The effectiveness of the environmental assessment, monitoring programmes and mitigation measures is dependent on having suitable baseline monitoring networks in place. The monitoring requirement for Bryher and the other islands is to be reviewed in consultation with the Environment Agency, Natural England, and the IoS Wildlife Trust. An appropriate monitoring programme will then be agreed with the Environment Agency for implementation by 31st March 2024 at the latest.

The draft drought plan will be updated with the relevant environmental assessments, monitoring programmes and proposed mitigation measures once agreement has been reached with the Environment Agency.

The SSSIs on the Isles of Scilly are either favourable condition or recovering. SWW are committed to ensuring no deterioration in the condition of the IoS SSSIs.

7.1.9 End of Drought

The end of the drought will be defined by demand dropping below the specified trigger threshold and GW level recovering above the trigger threshold for a sufficient period and combined with a favourable forecast of significant rainfall.

It is intended to undertake further detailed analysis linking rainfall, soil moisture deficit and groundwater levels through the development of conceptual groundwater model(s) for each island. The company intends to use a combination of rainfall, soil moisture deficit recovery together with forecast rainfall to inform its ‘end of drought’ predictions and will liaise with the Environment Agency to confirm the drought has ended before declaring it. The outputs of this work will be included in the updated IoS Appendix in 2024.

As with our mainland water supply areas, we will undertake a review of our Isles of Scilly Drought Plan implementation within six months of the end of a drought (see main Drought Plan, Section 7). Given we have been responsible for water supply of the islands for only a limited time and our draft drought plan is untested, we would seek to update and improve our management learning from our experiences and the additional environmental and other data that would have been generated.

We would seek to work with the Environment Agency, local authorities & key stakeholders on the islands (e.g. Council of the Isles of Scilly, Duchy of Cornwall, Tresco Estates) to listen to any concerns or recommendations that they may have to ensure future droughts are managed to limit the impact on the population and the environment.

APPENDIX A Drought Vulnerability Assessment

A.1 INTRODUCTION

A.1.1 Purpose of report

Drought planning guidelines² state that a company should have assessed the vulnerability of its supply system to different types of drought events and the probability of such events occurring. We carried out such assessments in our current WRMP for each of our Water Resources Zones, but at the time of publication we had not taken responsibility for the water supply of the Isles of Scilly.

The purpose of this report is to provide the appropriate evidence to support an assessment of the vulnerability of Isles of Scilly to drought climate change.

A.2 VULNERABILITY ASSESSMENT

It is recognised within the Environment Agency guidelines³ that the vulnerability assessment should be largely qualitative, based on a water company's current knowledge of system vulnerabilities and readily available information from previous drought and water resource management plans.

With this in mind, we have conducted a basic assessment of the extent to which the Isles of Scilly are susceptible to the adverse effects of climate change. Specifically, we have followed the approach set out in the Environment Agency's (2017) 'estimating impacts of climate change on water supply', which in turn refers to section 3.3.3 of the Environment Agency (2012)⁴ 'technical methods and instructions' and section 3.2 of the Environment Agency (2013) 'climate change approaches in water resources planning – overview of new methods'⁵. As specified in the guidance, our assessment has been based on the most up-to-date information available from the preparation of our previous water resources management and drought plans⁶.

The vulnerability assessment involves the creation of two decision-making tools:

- A magnitude versus sensitivity plot; and,
- A tabular summary of the information used to determine the final vulnerability of each WRZ to climate change.

The magnitude versus sensitivity plot is used within the tabular summary to inform the qualitative determination of the final climate change vulnerability, alongside with other

² Environment Agency - Water company drought plan guideline April 2020

³ *Ibid* 3 & 4

⁴ *Ibid* 4

⁵ Environment Agency (2013) *Climate change approaches in water resources planning – Overview of new methods*. Report – SC090017/R3

⁶ South West Water (2013) *Drought Plan*.

http://www.southwestwater.co.uk/media/pdf/l/n/South_West_Water_Drought_Plan_March_2013.pdf

South West Water (2014) *Water Resources Management Plan*

https://www.southwestwater.co.uk/media/pdf/o/o/Water_Resources_Management_Plan_June_20141.pdf

Sembcorp Bournemouth Water (2012) *Drought Plan*. <http://www.bournemouthwater.co.uk/company-information/economic-regulation/drought-plan.aspx>

Sembcorp Bournemouth Water (2014) *Water Resources Management Plan* <http://www.bournemouthwater.co.uk/company-information/economic-regulation/water-resources-plan.aspx>

information and knowledge of the particular WRZ system. These decision-making tools are described further in Sections 2.1 and 2.2, respectively.

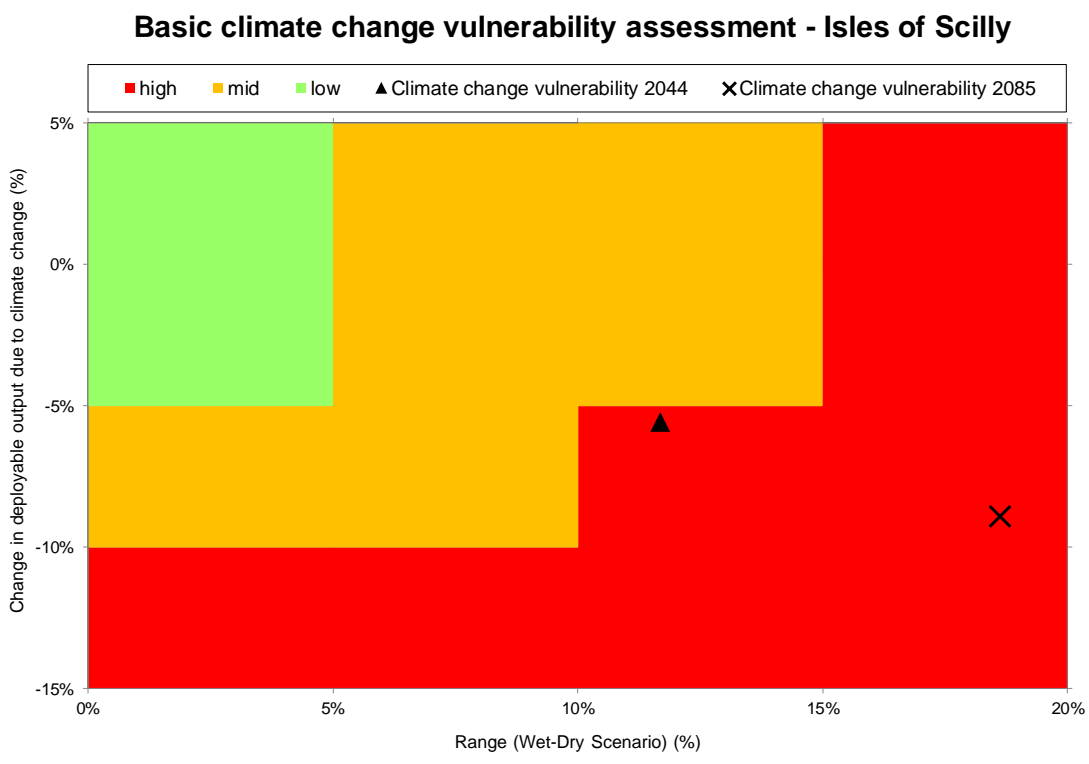
A.2.1 Magnitude versus sensitivity plot

Our magnitude versus sensitivity plot is presented in Figure A.1. The plot shows the change in Water Available For Use (WAFU) by the year 2035 for the 'mid' climate change scenario, plotted against the uncertainty range (the percentage difference between the 'wet' and 'dry' scenarios). As in our previous plan, we have used WAFU as a surrogate for deployable output. This approach is allowed for within the Environment Agency (2013) guideline 'overview of methods' and has been previously approved by the Environment Agency.

The magnitude versus sensitivity plot uses the latest information available on the impact of climate change on WAFU, as assessed from our current understanding of likely source performance under different drought conditions. The climate change scenarios are based on the UK Climate Projections 2009 (UKCP09).

The vulnerability classification for each WRZ has been identified using the vulnerability scoring matrix in the Environment Agency's (2013)⁷ 'climate change approaches in water resources planning - overview of new methods'.

Figure A.1: Magnitude versus sensitivity plot for the year 2035



A.2.2 Vulnerability assessment table

A summary of the information used to determine the vulnerability of the Isles of Scilly is presented in Table A.1 below.

As recommended in the Environment Agency guidelines⁷, the information provided in the table is based on our current knowledge of system vulnerabilities.

Table A.1: Vulnerability assessment table - Isles of Scilly

Isles of Scilly			
Description	Source	Data	Comments
Critical drought years (top three)	Rainfall data analysis	1976	
Period used for Analysis (historic flow or gw level record)		Tbc	Isles of Scilly rainfall data analysis being undertaken to identify range of data available and key drought years.
Types of Sources	Island records	Local groundwater sources supported by a de-salination plant on St Marys.	The results of abstraction licence applications are awaited – due Oct 2021.
Supply-demand balance (base year)	Internal assessment of source data	No formal assessment is currently available but, subject to the abstraction licence application results, should be in slight surplus.	
Security of water supply and/or water scarcity indicators	Company Annual Performance Report (CAPR) or equivalent	Security of Supply Index (SoSI) for 2014/15 is reported as 100 as the islands were included in the Colliford WRZ. Going forward the islands will report a separate SOSI value. Current understanding indicates this could be <100 even during low severity droughts.	SoSI is envisaged to remain at 100 throughout the WRMP19 planning period. The SWW area has been classified at Not Serious stress level by the Environment Agency ⁸ .
Critical climate variables (e.g. summer rain, winter recharge)	Drought Plan 2013/ WRMP 2014 modelling work	Assessment of climate change to be completed. Overall regional assessments for the South West suggest more winter rainfall and less summer rain. Due to lack of storage (surface or groundwater) additional winter water cannot be stored making the island very	

⁷ Ibid^{3&4}

⁸ Environment Agency & Natural Resources Wales (2013) *Water Stressed areas – final classification*. Cat code: LIT 3230

Isles of Scilly			
Description	Source	Data	Comments
Climate change DOs (Dry, Mid, Wet Scenarios from 2014 WRMP)	2019 WRMP modelling work	vulnerable to a climate change impacts. Tbc	
Adaptive capacity (List of available sources and drought measures)	Company data	There are no alternative sources of supply other than the groundwater sources and the de- salination plant. As the desalination plant relies on a proportion of groundwater for blending purposes the potential for increasing out is limited.	
Sensitivity from information in table above (low/medium/high)		HIGH	
Vulnerability classification from our magnitude versus sensitivity plot (Figure 2.1)		HIGH	
Identify overall vulnerability and proposed climate change assessment method		HIGH	

A.2.3 Vulnerability classification conclusion

We have used the information from the vulnerability assessment tables to form the view that the Isles of Scilly are within the HIGH vulnerability to climate change category. As summarised in Table A.1, the key reasons for this are:

- Lack of long-term source performance data.
- The small surplus of supply capacity over demand in the summer months.
- The limited storage in the main aquifer system and its reliance on regular recharge events.
- No interconnectivity between the islands.

- Lack of support available from alternative, essentially mainland sources of supply.
- Islands are classified as “Serious” under recent reclassification of water stressed regions in the UK.

Table A.2: Vulnerability to climate change categorisation for the Isles of Scilly

WRZ	Vulnerability to climate change category
Isles of Scilly	HIGH

APPENDIX B St Mary’s Technical Appendix

B.1 Additional environmental drought triggers

In addition to groundwater and demand levels, other criteria will be considered in assessing the drought severity level, such as rainfall and stream flow. These will be used to inform our response as a drought develops and the actions that we may wish to put in place.

Table B1 gives an overview of some of the key hydrological / environmental parameters that will be considered as drought triggers (in addition to the primary triggers of groundwater levels and/or demand). The selection of drought triggers will be in part dependent on the review of data from the monitoring network to be implemented by 31st March 2024. The monitoring plan is currently under review prior to agreement with the EA, NE and IoS WT.

If appropriate we will develop triggers for water resource sub-zones (i.e. individual islands or groups of islands). These will help determine which options are required and when, based on improved understanding of the potential for environmental impact. The data collection, analysis and proposed approach will be included in the 2024 update to the IoS Drought Plan.

Table B1: Overview of additional parameters considered as drought triggers

Hydrological parameter	Drought Level 1 trigger	Drought Level 2 trigger	Drought Level 3 trigger	Drought Level 4 trigger
Rainfall (St Marys airport gauge)	Notably Low	Exceptionally Low	Exceptionally Low and lower than historic worst drought years	Exceptionally Low over widespread area and significantly lower than historic worst drought years
Groundwater levels (Lower Moors)	Notably Low	Exceptionally Low	Exceptionally Low and lower than historic worst drought years	Exceptionally Low over widespread area and significantly lower than historic worst drought years
Stream flows (Higher Moors only)	Notably Low	Exceptionally Low	Exceptionally Low and lower than historic worst drought years	Exceptionally Low over widespread area and significantly lower than historic worst drought years
Groundwater levels (Carrs Well)	Notably Low	Exceptionally Low	Exceptionally Low and lower than historic worst drought years	Exceptionally Low over widespread area and significantly lower than historic worst drought years
Soil moisture deficit (SMD) (EA data)	Notably High	Exceptionally High	Exceptionally High for a sustained period	Exceptionally High over widespread area for longest period on record

Preliminary analysis was conducted using Met Office rain gauge data from 1930-date (missing data was infilled with HadUK 5km). Moving forward we will be using HadUK 1km data to infill missing periods. We are also investigating the potential to measure rainfall on each of the islands to see if there is potential to “scale” the available historical rainfall data to create ‘synthesised’ long term rainfall records for each island on which to base the drought vulnerability and drought trigger analyses. The current rainfall data has been used to create preliminary initial return period and drought resilience surfaces which will be further refined in the light of additional information collected in the next two years and beyond. It is intended to undertake further detailed analysis linking rainfall, soil moisture deficit and groundwater levels through the development of a of conceptual groundwater model(s) for each island. The outputs of this work will be included in the updated IoS Appendix in 2024.

B.1.1 Testing of the St Mary's Drought Triggers

B.1.1.1 Summary of 2018 event timeline

Table B2 below shows the timeline of the 2018 event with activities and decision.

Table B2: Event timeline for 2018 dry weather event.

Time period, drought level, operational mode	Actions and decisions	Environmental monitoring*
January – late June 2018 Level 0: Normal operation	Routine monitoring Hot, sunny & dry June	Normal level of monitoring
Early July 2018 Level 0: Normal operation, dry weather warning	Continued hot dry weather, steep downwards GW recession and dry forecast > enhanced media campaign considered.	Level of monitoring increased
Mid July 2018 Level 1 – enhanced media campaign	Short break in weather results in slight recovery in GW level then further hot dry weather sees return to steep recession. Further hot dry weather forecast. Enhanced media campaign launched.	Increased level of monitoring
Late July-August 2018 Level 1 – enhanced media campaign	General pattern of hot dry weather with limited showers. Forecast remains largely settled, hot and dry. Media campaign ramped up with regular media updates in lead up to August bank holiday peak visitor period. Reduced demands following success of media campaign.	Increased level of monitoring
Early September 2018 Level 1: media campaign continues	Weather breaks and forecast changes to more unsettled period with more rainfall. GW recession slows and shows signs of recovery. Return to school sees drop in visitor numbers & demand.	Normal level of monitoring – watching brief
Mid/late September 2018 Level 0: normal operation	Further rainfall and GW levels continue to recover.	Return to normal level of monitoring

Time period, drought level, operational mode	Actions and decisions	Environmental monitoring*
October – December 2018 Level 0: normal operation	Further drop in demand as visitor numbers reduce. Media campaign no longer required. Low demand, GW levels continue to recover.	Normal level of monitoring

*- The baseline environmental monitoring plan, including ecological, surface and groundwater elements) is to be agreed with the Environment Agency, Natural England and the IoS Wildlife Trust. 'Increased monitoring' involves increasing the frequency of baseline monitoring/sampling at existing sites, 'Enhanced monitoring' would involve a further increase in monitoring/sampling frequency and the inclusion of additional monitoring sites/locations (in consultation with the EA, NE and IoS WT), where appropriate, based on improved understanding of impacts as a drought develops.

B.1.1.2 Plausible extended drought scenario 2018+

We have considered a significantly worst drought event than occurred in 2018 by extending the dry period experienced in that year by a further month. Rainfall analysis suggests this provides a good approximation to an event similar to the summer of 1976. The initial hydrometeorological analysis of return periods for the 1976 spring/summer rainfall data indicate a return period of greater than a 1 in 500 event.

It should be noted that this is intended as a preliminary representation in the absence of detailed data and information. The reduction in steepness of the slope of the drought curve under the 2018+ scenario assumes a positive impact due to an escalating media campaign and the subsequent introduction of TUBS / non-essential use bans. This will be refined in the updated IoS Appendix in 2024 on basis of latest data, analysis and understanding at the time.

Figure B1: St Mary's drought curve - 2018 extended scenario

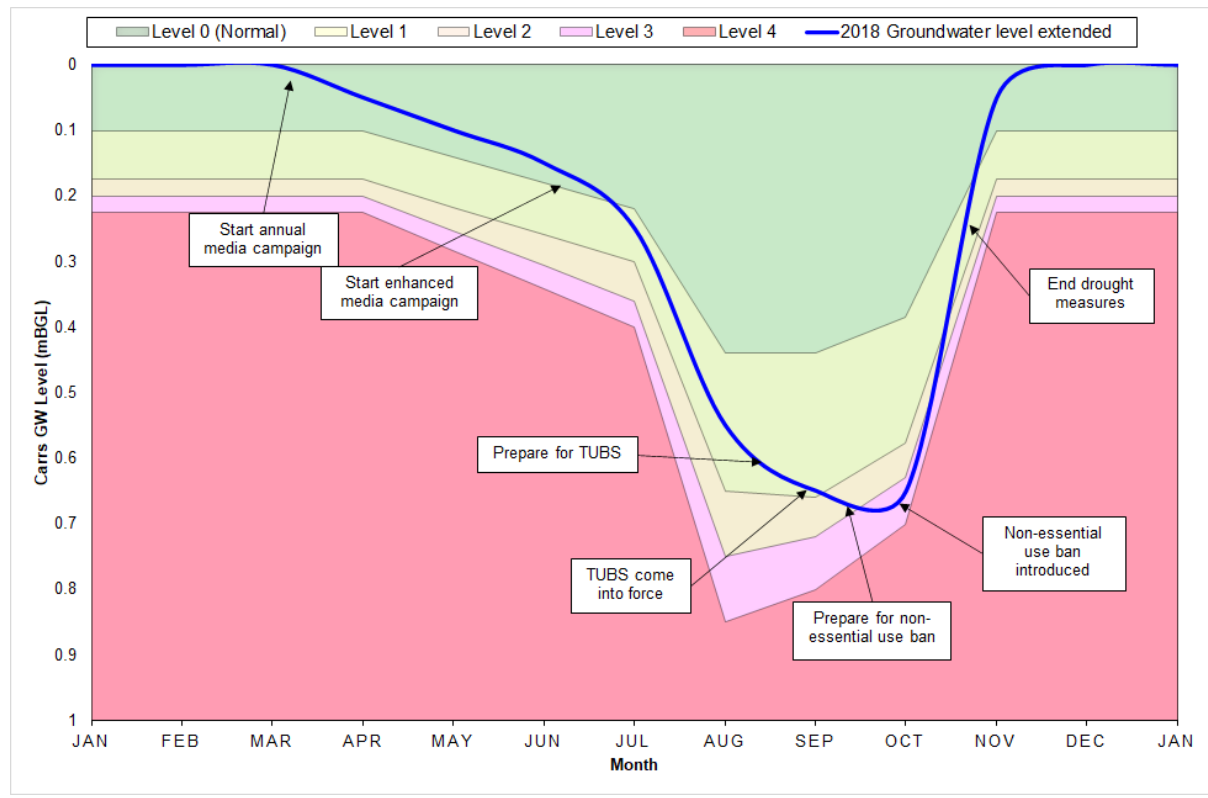
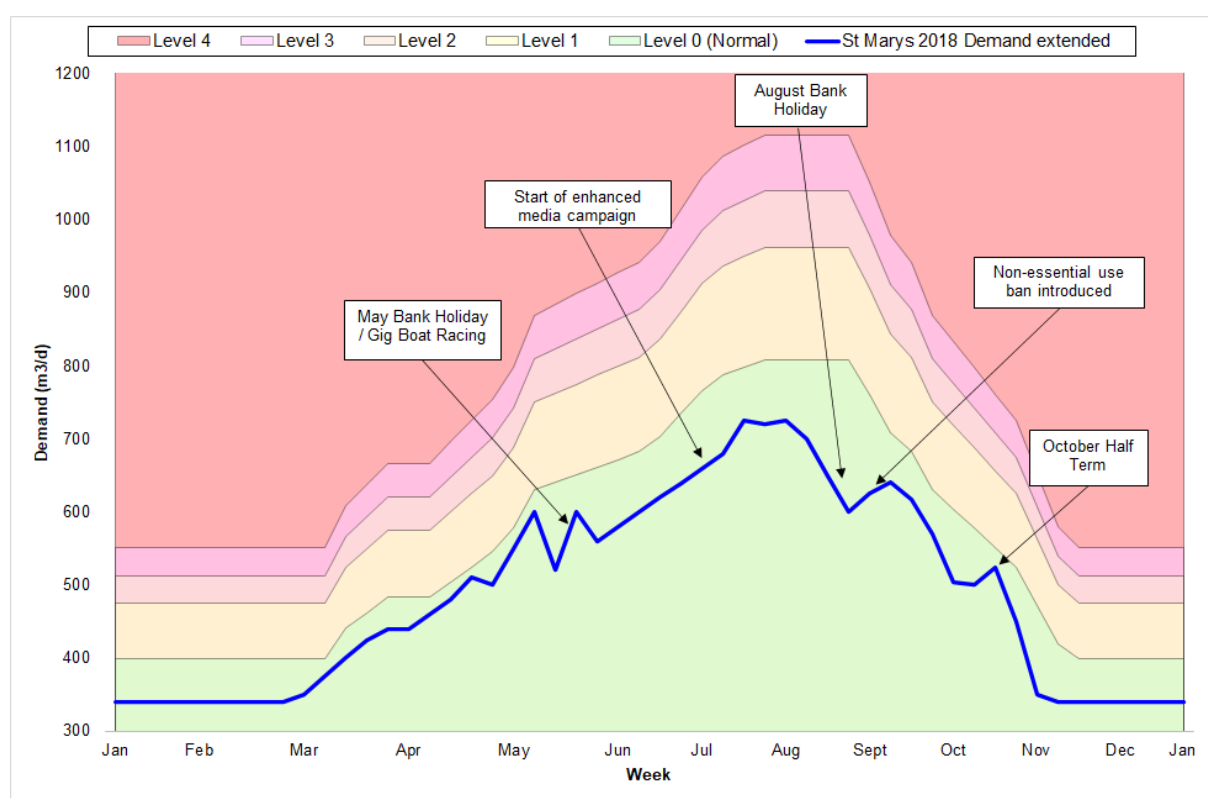


Figure B2 St Mary's demand curve - 2018 extended scenario



B1.1.3 Summary of theoretical 2018 extended scenario timeline

Table B3 below shows the theoretical timeline of the extended 2018 scenario with activities and decisions.

Table B2: Event timeline for theoretical 2018 extended dry weather scenario

Time period, drought level, operational mode	Actions and decisions	Environmental monitoring*
January – late June 2018 Level 0: Normal operation	Routine monitoring. Hot, sunny & dry June.	Normal level of monitoring
Early July 2018 Level 0: Normal operation, dry weather warning	Continued hot dry weather, steep downwards GW recession and dry forecast > enhanced media campaign considered.	Level of monitoring increased
Mid July 2018 Level 1 – enhanced media campaign	Short break in weather results in slight recovery in GW level then further hot dry weather sees return to steep recession. Further hot dry weather forecast. Enhanced media campaign launched.	Increased level of monitoring
Late July-August 2018 Level 1 – enhanced media campaign	General pattern of hot dry weather with limited showers. Forecast remains largely settled, hot and dry. Media campaign ramped up with regular media updates in lead up to August bank holiday peak visitor period. Reduced demands following success of media campaign.	Increased level of monitoring
Late August 2018 (ext. scenario) Level 1: enhanced media campaign continues	General pattern of hot dry weather continues. Forecast remains largely settled, hot and dry.	Normal level of monitoring – watching brief
Level 2: TUBS considered / preparation	Media campaign ramped up with regular media updates in lead up to August bank holiday peak visitor period.	

Time period, drought level, operational mode	Actions and decisions	Environmental monitoring*
<p>Early September 2018 (ext. scenario)</p> <p>Level 2: TUBS implemented</p> <p>Prep for Non-essential use ban.</p>	<p>Ongoing GW recession coupled with return to increasing demands and continued dry forecast leads to decision to implement TUBS. Non-essential use ban considered.</p>	<p>Enhanced monitoring</p>
<p>Mid-September</p> <p>Level 3: Non-essential use ban.</p>	<p>Ongoing GW recession coupled with return to increasing demands and continued dry forecast leads to decision to implement TUBS and non-essential use ban.</p>	<p>Enhanced monitoring</p>
<p>Late September - October 2018</p> <p>Level 1: media campaign continues</p>	<p>Weather breaks and forecast changes to more unsettled period with more rainfall.</p> <p>GW recession slows and shows signs of recovery.</p> <p>Return to school sees drop in visitor numbers & demand.</p>	<p>Normal level of monitoring – watching brief</p>
<p>Mid October 2018</p> <p>Level 0: normal operation</p>	<p>Further rainfall and GW levels continue to recover.</p> <p>Further drop in demand as visitor numbers reduce. Media campaign no longer required.</p>	<p>Return to normal level of monitoring</p>
<p>October – December 2018</p> <p>Level 0: normal operation</p>	<p>Low demand, GW levels continue to recover.</p>	<p>Normal level of monitoring</p>

*- The baseline environmental monitoring plan (including ecological, surface water, groundwater and water quality elements) is to be agreed with the Environment Agency, Natural England and the IoS Wildlife Trust. 'Increased monitoring' involves increasing the frequency of baseline monitoring/sampling at existing sites, 'Enhanced monitoring' would involve a further increase in monitoring/sampling frequency and the inclusion of additional monitoring sites/locations (in consultation with the EA, NE and IoS WT), where appropriate, based on improved understanding of impacts as a drought develops.

APPENDIX C Community Communications Plan

C.1 Phases of Communication

The following sections set out the approach for community communication in each drought phase.

C.1.1 Normal operating phase (Traffic Light – Green (awareness))

Unlike the mainland, in the normal operating phase we will commence messaging on the water resource position each year in the lead up to Gig Weekend. This is typically the end of April.

This is to coincide with the increase in demand seen that weekend and coincides with the normal start of the tourist season. Communication will be done via email and social media.

Free water saving goods will be promoted at the start of this process and will operate until the end of the summer.

C.1.2 Level 1 – media campaign (Traffic Light – Amber (action needed))

This phase will communicate an escalating drought risk. In this phase a media campaign on the island will be started. This will operate on a rolling weekly basis. In addition to the normal operating phase this will include:

- Early engagement with the Environment Agency (continuing throughout Levels 1-4)
- A local drought community liaison officer on the islands to co-ordinate communications.
- Door to door community liaison.
- Distribution of free water saving goods.

In this phase we will look to advertise that a TUB may be needed up to 3 weeks before its implementation. Formal notice will be given 1 week ahead of need. This will set out the details of a Temporary Use Ban including the exemptions.

C.1.3 Level 2 – demand restrictions phase (Traffic Light – Amber (demand restrictions))

Formal community communication will increase to twice a week. In this phase, a Temporary Use Ban will be communicated. Q&A on the temporary use ban and the treatment of exemptions will be managed through the Drought Management Group on a case by case basis.

To support the drought community liaison officer, support officers will be in place on each island to communicate and given daily support the local community on water saving activities and the actions being taken to ensure supply-security. This allows the actions to be tailored to the specific community's needs.

This phase will prepare and communicate the material for any future Non-Essential Use Ban.

C.1.4 Level 3 – severe demand restrictions phase (Traffic Light – Red (severe demand restrictions))

Formal communication on the drought situation will move to a daily update. In this phase a non-essential use ban will be implemented. Communication and delivery will be implemented through the Drought Liaison Support officers on each Island. This allows it to be tailored for the community.

Exemptions and any escalations will be managed through the Platinum Drought Group.

A specific media spokesman will be in place to manage the expected Media interest.

C.1.5 Level 4 – Emergency operation (Traffic Light – Black)

Communication plans would be developed for each island reflecting the specific plans. This would be done at the time reflecting the local needs.

C.1.6 Detailed Community Communication Plan

The following table sets out the detail of the communication plan activity.

Table C1: Detailed communications plan for the Isles

Drought Severity Stage	Level	Forecast position	Traffic Light	Communication Plan Phases	Purpose	Typical comms frequency	Environment Agency Liaison frequency	Drought Community liaison officer
Normal operation stage	0	Normal operation	Green (awareness)	Normal operation	Communicate resource position and on-going need for water efficiency	Fortnightly from start of Gig Week. Weekly	Fortnightly written updates	No
Drought operation stage	1 (prolonged dry weather)	L1 or lower	Amber (action needed)	Media campaign phase	Communicate position and call for restraint on demand	Weekly	Weekly	Yes
	2 (drought)	L2 or lower	Amber (reduce demand)	Demand restrictions phase	Communicate formal restrictions on demand (TUBS)	Daily	Sub weekly	Yes
	3 (drought)	L3 or lower	Red (severe restrictions)	Severe demand restrictions phase	Communicate non-essential use bans and emergency Drought Orders	Twice daily	Daily	Yes
Emergency operation Stage	4 (severe drought)	L4	Black (emergency operation)	Emergency Drought Orders phase	Communicate process for managing remaining supplies and public health needs	As needed	As needed	Yes

Figure 7: Example island communication

Water shortage on St Mary's

Notice to all residents, businesses and visitors

Issued: 30 July 2018

Water usage has reached an unsustainable level on St Mary's and the Council is unable to meet demand without seriously damaging our wells and boreholes. The extreme dry period this summer is set to continue so we must ask all of our customers to take significant steps to decrease their water usage before it is too late. Please read and share this notice.

Desalination isn't enough

Contrary to what you may have heard, the desalination plant cannot meet all our water needs alone. The plant only provides around a third of demand.

250m³

450m³

36%
DESALINATED
SEAWATER

64%
GROUNDWATER

700m³
DEMAND

Furthermore, running the equipment at maximum rate, as we are now doing, greatly increases the risk of a breakdown. There is no backup desalination plant.

Groundwater depletion

Most of our supply comes from groundwater. This is the subsurface water accessed by drilling boreholes into the granite bedrock. Unlike surface reservoirs, these sources are extremely difficult to monitor. However, all of our tests indicate that the groundwater supply is at an historic low and is being extracted at an unsustainable rate. This creates 3 problems:

1. We may run out of groundwater.
2. The groundwater contaminant concentration may become too high to be treated.
3. The low pressure and reduced levels in the groundwater could result in seawater getting into the wells and boreholes and contaminating the water, causing the source to be unusable for a generation.

We need to reduce our reliance on groundwater by decreasing our water consumption.

What about the reservoirs?

There are no reservoirs on the Isles of Scilly. St Mary's has 3 water tanks that continually fill with drinking water. They replenish at night when usage is low but are often empty by the end of each day.

What happens if we run out of water?

The Council has emergency plans in place should the islands run out of water. In short, this would involve shipping water to the islands with a ration per head each day. Clearly we need to avoid this situation.

C.1.7 Compensation - Process and Communication

People who suffer loss or damage as a result of a Drought Order are entitled to compensation subject to certain qualification criteria. Claims must be made within six months of the date of expiry of the Order. The rules are set out in Schedule 9 of the Water Resources Act (WRA) 1991. Those who may claim are:

- The owners of the source
- All other persons interested in the source or adversely affected by the taking of water.

The claimant must serve notice on the Drought Order applicant stating the grounds of the claim and the amount claimed. We are not required to pay compensation to customers if the circumstances are so exceptional that, in Ofwat's view, it would be unreasonable to expect

the interruption to supply to be avoided and under the WRA 1991, customers are not entitled to compensation in respect of loss or damage sustained as a result of the implementation of Drought Permits/Orders. Other compensation would be paid in line with existing guaranteed standard schemes. This is available on the SWW website. As part of our communications plan, this information would be sent to those affected in advance of any Drought Orders (by email and mail). It would also be communicated on our website. The customer communications team would process any replies to keep a consistent and common approach to all those affected.

APPENDIX D Environmental Assessment with Monitoring and Mitigation

Table D1: Environmental assessment for Joaneys well.

Isle of Scilly Island	St Mary's		
SWW Supply Side Option:	Joaneys Well		
Designated Site	Lower Moors SSSI		
Qualifying Features	Qualifying Habitats <i>Phragmites australis</i> swamp	Water Dependent Yes	
Management Pressures & Objectives for Designation	<ul style="list-style-type: none"> Groundwater system sensitivity to SWW abstraction. Original designation is for freshwater botanical species. Wetland is significant contributor to potable water supply. Legacy incinerator on Western side likely to be cause of present-day pollution. Flooding present at industrial site u/s of wetland. Saline intrusion is a known problem. Climate change induced sea level rises likely to magnify flooding and saline intrusion. 		
Environmental Assessment			
Receptor	Assessment	Further Monitoring	Management / Mitigation
Hydrology	<ul style="list-style-type: none"> Groundwater system sensitivity to abstraction 	Flow, level and salinity	<ul style="list-style-type: none"> Dependent on future monitoring. Potential changes to operating procedures.
	<ul style="list-style-type: none"> Culverts and drainage allow saline intrusion. Stop planks currently used with tidal flap not sealing 	Flow, level and salinity	<ul style="list-style-type: none"> Replace tidal flap. Assess less resource-intensive and more responsive methods to use of boards.
Ecology (Botany)	<ul style="list-style-type: none"> Good botanical diversity present. Scrub presence Non-native Toothed Fireweed species present 	Annual botanical surveys	<ul style="list-style-type: none"> Allow cattle grazing across larger area following annual cut. Scrub removal and herbicide treatment Hand pulling
SWW Escalating Measures through Demand & Groundwater led Drought severity*			
	Level 1	Level 2	Level 3
Monitoring	Weekly data collection and analysis	Twice weekly data collection and analysis	Daily data collection and analysis
Mitigation	Minimising of abstraction through prioritising of other sources	Reduced abstraction to stabilise local GW level	Only abstract for limited, peak periods in the day

* Under Extreme Drought conditions (Level 4) we may consider abstracting additional water from Joaneys Well to meet demands, despite environmental threshold. We will work with the Environment Agency, IoS WT and other bodies at the time to identify appropriate mitigation for increased abstraction.