

# Water Resources and Drought Management Plan 2025-2080 Summary



States of Guernsey  
Trading Group



GuernseyWater

[water.gg](http://water.gg)





# CONTENTS



|  |    |
|--|----|
| Our Outcomes                             | 3  |
| Summary                                  | 5  |
| Future Supply Demand Balance Projections | 7  |
| Evaluating the Adaptive Plans            | 13 |
| References                               | 14 |

# OUR OUTCOMES







Our vision is focused on the value of our core business which is water and wastewater service provision.

**“Customers always value the quality of our drinking water and the safe return of our wastewater to the environment.”**



## Summary

Guernsey Water is updating the Water Resources and Drought Management Plan (“The Plan”) that was published in 2018. The review was initiated to help inform the Committee for the Environment & Infrastructure’s (CfE&I) recommendations on the future strategic use of Les Vardes Quarry. This interim summary provides an overview of the updated Plan.

The Plan covers the period from 2025 to 2080 and considers the adequacy of available water supplies to meet demand during a severe drought during this time. The reliability standard used aligns with current water industry practice in England and assumes that by 2040 the island must be resilient to cope with worse droughts than have occurred in the past.

Population growth is forecast to increase daily demand for water from an average of 13.5 million litres to 14.4 million litres by 2040. Changing weather patterns, due to climate change, and water quality risks could also negatively impact the availability of reliable water supplies over this time. This combination of factors is likely to mean current water storage resources will be inadequate in meeting demand during severe drought conditions in future. Increased demand, due to population growth is the main contributor to the anticipated shortfall.

The Plan considers several adaptive plans to address the projected shortfall. Common to all of these is a package of demand management measures, such as compulsory water metering. Temporary restrictions when reserves are low, such as hosepipe and sprinkler bans, would also help reduce demand at critical times. However, it is anticipated these measures will not be sufficient to offset fully the anticipated supply shortfall during a severe drought. The review concludes sufficient resilience can only be achieved by the development of a new water resource.

Two feasible options for this have been identified. These are:-

- Conversion of Les Vardes Quarry to a water storage reservoir;
- Construction of a sea water desalination plant.

Either of these new water resources, combined with demand management, would provide a secure, resilient water supply for future generations.

From a water strategy perspective, developing Les Vardes Quarry and retaining Longue Hougue Reservoir is considered the lowest cost, least risk and lowest impact of all the adaptive plan options considered. The CfE&I must balance this against consideration of future requirements for management of inert waste. That wider consideration is set out in a policy letter on the future strategic use of Les Vardes Quarry<sup>1</sup> to be debated by the States Assembly. The outcome of that debate will provide the direction required to finalise the updated Plan.



# Introduction

**Our water and wastewater systems are adapted to climate change and have sufficient capacity to meet the future needs of our island.**

- 💧 **Develop long-term strategies for water resources and drainage**
- 💧 **Invest in the resilience of our critical assets**
- 💧 **Plan to be ready for emergencies**

Guernsey Water is responsible for providing secure, high quality and reliable water supplies to around 23,000 households and 3,100 commercial customers across the island. This relies on an integrated water resource system comprising stream intakes, raw water storage facilities, treatment works and treated water storage reservoirs, which together supply customers through a network of distribution pipes.

The review of the Plan identifies:

- How demand for water and water supply could change between now and 2080;
- How adequate water could be provided to meet demand in drought conditions;
- Risks and uncertainties, such as climate and population change, which may affect the balance between demand for water and the reliable supplies available in a drought;
- Options to address the supply demand shortfall between now and 2080.

The conclusions of this review will help inform the CftE&I's recommendations in relation to the future use of Les Vardes Quarry, which is one of the options identified for future water resource improvement.

Les Vardes is a privately owned quarry that remains in active use. Under current States policy, the site is "safeguarded" for future water storage once stone extraction ceases. This does not guarantee it will be used as a reservoir, but any form of development that may compromise its future use for

this purpose is not currently permitted. However, there is provision within the policy for the States to prioritise its use for other strategically essential development, besides water storage, should that case be made.



**Risks and uncertainties, such as climate and population change, may affect the balance between demand for water and the reliable supplies available in a drought**

# Future Supply Demand Balance Projections

## Water Supply Reliability Standards

The Plan considers the balance between reliable water supplies and the demand for water during a severe drought.

The water reliability standard applied when the Plan was previously updated was based on avoiding a repeat of the worst recorded drought in Guernsey. An improved standard has now been adopted, consistent with water companies in England<sup>2</sup>. This reflects concerns relating to climate change, population growth, and the severe impact of water restrictions on people, the environment and economy.

This will ensure that by 2040, the island will be resilient to more severe droughts than have occurred in the past. This is important because climate change is predicted to cause hotter drier summers that result in severe drought becoming more likely during the period the Plan covers.

In practice, the improved standard requires Guernsey Water to be able to supply an additional 0.8 million litres of water per day during severe drought, compared to the previous reliability standard. In itself, this does not require a new water resource for Guernsey.



**Guernsey Water's Plan will ensure that by 2040, the island will be resilient to more severe droughts than have occurred in the past**

The Plan identifies a range of demand management measures, such as compulsory metering, which can meet this requirement. The main factor driving the need for a new water resource is projected population growth<sup>3</sup>, which for planning future infrastructure and service provision assumes +300 net migration per year over the next 30 years.

## Water Quality Risks

In addition to climate and population change, the plan must also consider other risks, such as the effect of pollution in some catchments, including from pesticides and other chemicals. Pollution levels are continually monitored, and water from these catchments is not used if levels exceed that required to meet stringent drinking water quality standards. Currently, this equates to a reduction in supply capacity of up to 2.3 million litres per day.

By 2030, water companies in England will have to comply with more stringent standards for PFAS; a range of chemicals that persist in the water environment for many decades. Guernsey Water is planning to do the same, which will require major investment in water treatment. This will increase reliable supplies, which is accounted for in the Plan's supply demand balance projections.

## Climate Change

The Plan's updated assessment indicates that by 2040 a total of 10.6 million litres per day of reliable water supplies would be available in a severe drought. However there remains considerable uncertainty regarding future impacts of climate change on water resources. For example, it is not known how hot and dry summers may become; or how warmer and wetter winters may be. However, there is clear evidence that these effects are already being experienced<sup>4</sup>.



**The main factor driving the need for a new water resource is projected population growth**

All 10 of the warmest years on record in the UK have occurred since 2000, along with five of the wettest years. It is estimated that climate change could reduce the reliable supply to 9.9 million litres per day by 2080 (Figure 1).

This can be alleviated by additional reservoir storage, allowing more water to be captured during wetter winters to reduce the risk of water use restrictions caused by drought during drier summers.

### Population Change and Water Efficiency

An important factor in the supply demand balance is how many people will be living in Guernsey over the next 55 years. Guernsey

Water considered several projections of future population to understand how this could affect demand for water.

The updated Plan assumes net migration consistent with the population and immigration policy adopted by the States of Guernsey for future infrastructure planning. This is projected to increase population from 63,155 in 2021 to 72,700 by 2080. This would increase overall average daily demand for water in severe drought conditions from 13.5 million litres in 2025 to 14.4 million litres by 2040 (Figure 1).

From 2040, the demand projection shows a small, continual reduction to 13.7

million litres by 2080. This is due to assumed improvements in water efficiency, linked to increasingly efficient domestic appliances and newer housing stock.



**Additional reservoir storage, allows more water to be captured during wetter winters to reduce the risk of water use restrictions caused by drought during drier summers.**





### Supply Demand Shortfall

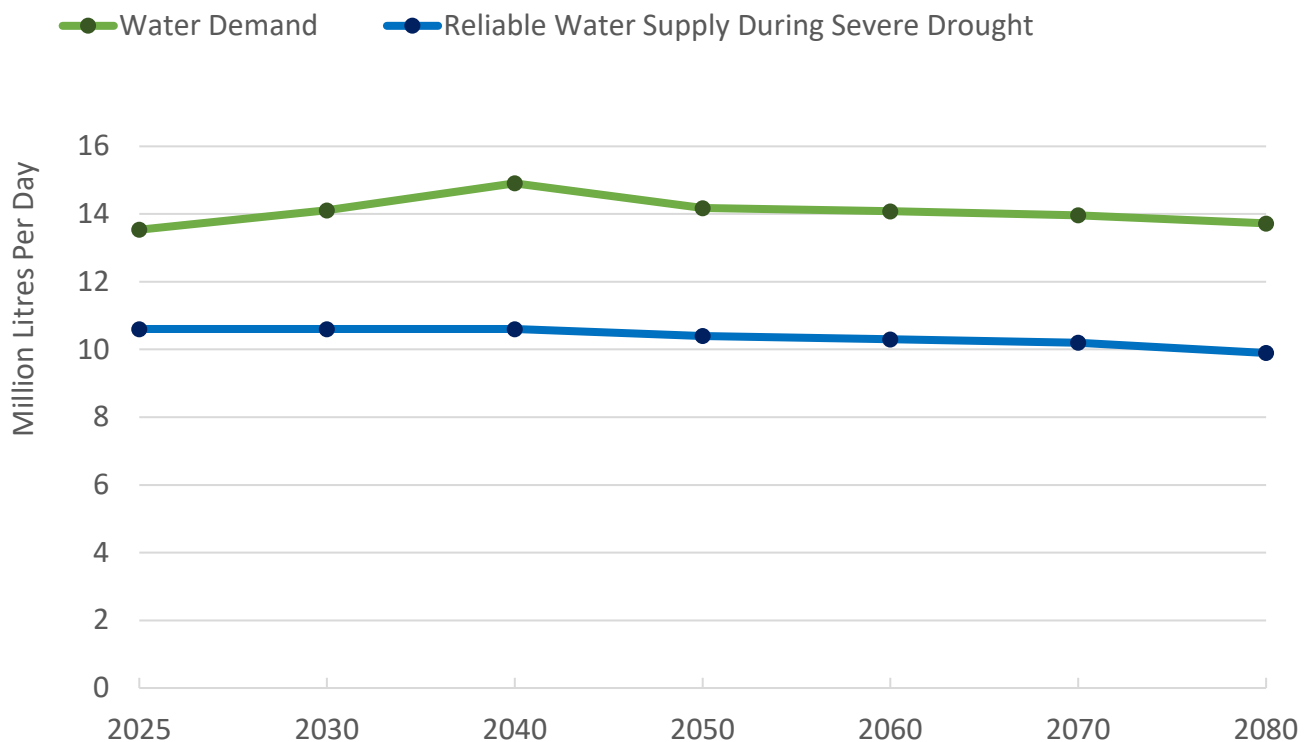
Figure 1 shows the anticipated water supply capacity and demand based on the projections detailed above. This indicates a daily supply shortfall across the whole planning period in a severe drought – rising from 2.9 million litres in 2025 to a peak of 4.3 million litres by 2040 – reflecting growth in demand. This then decreases slightly

to 3.8 million litres from 2050 onwards.

This means that, without intervention, temporary rationing of essential supplies would be necessary in a severe drought. Water would have to be switched off to different parts of the island on a rotational basis to prevent reservoirs from completely emptying. This would be very challenging for

the island and is considered an unacceptable risk due to the severe implications for public health and the economy. Therefore, Guernsey Water is planning to avoid the use of water rationing, which should only be required under the most extreme of scenarios that are beyond current drought planning standards.

**Figure 1. Future demand and reliable water supply projections in severe drought conditions.**



## Adaptive Planning Approach

The Plan adopts an adaptive planning approach. It considers the changing risks at key milestones up to 2080, alongside the lead times required to implement different demand management and water resource options needed to maintain supply reliability. This provides strategic direction rather than a programme of work to be implemented at specific dates, which will be developed over time as the balance between available supply and demand changes.

To develop the Plan, various potential demand management and water resource scenarios have been considered. These were assessed against a range of criteria, including cost, reliability, environmental effects, and operational and delivery risks. Those that scored highest have been included in adaptive plan options.

The Plan will be reviewed every five years, or if there is material change to the assumptions behind it.

## Demand Management

Detailed desktop work has been conducted to assess a wide range of technically feasible options to address the anticipated supply shortfall.

Common to all these adaptive plans is a package of demand management measures, including compulsory water metering and additional water efficiency awareness activities. These could contribute 1 million litres per day towards reducing the supply shortfall.

Further temporary measures could also be applied to reduce the supply demand shortfall during critical periods, including:

- Customer water efficiency campaign: ask customers to voluntarily reduce non-essential water use, such as garden watering and car washing;
- Temporary non-essential water use bans: formal restrictions on the use of hoses and sprinklers;
- Drought orders: further formal restrictions on non-essential use.

The remaining shortfall can only be addressed by the development of a new water resource.

## New Water Resource Options

New water resource options were considered for inclusion in the adaptive plans to address the residual supply shortfall. Two feasible options emerged:

### Conversion of Les Vardes Quarry to a Water Storage Reservoir

Converting Les Vardes Quarry could increase total reservoir storage capacity, providing an additional 2.9 million litres of reliable water supply per day in a severe drought. This could feasibly be delivered by around 2035, allowing time for full extraction of stone reserves to maximise storage capacity, and for completion of engineering works to prepare the quarry for storing water. New water pipelines could be installed in advance so the new reservoir could be connected as soon as the engineering works are complete.



**Temporary measures could also be applied to reduce the supply demand shortfall during critical periods.**



### Construction of a Sea Water Desalination Plant

A sea water desalination plant near the coast at Longue Hougue could provide up to 5 million litres of reliable water supply in a severe drought. This could feasibly be delivered by around 2031, allowing time for construction of the sea water intake and pipeline, desalination works and new pipelines to take the desalinated water into a nearby reservoir, for storage in the usual way before being treated.

Blending with stored water is necessary because without significant investment in further treatment, the desalinated water would not be suitable for drinking.

Combined with demand management measures, either of these new water resources, would provide a secure, resilient water supply for future generations of islanders.

### Water and Waste Options

The Plan has considered the potential for dual use of Les Vardes Quarry, combining both inert waste disposal and water storage, as well as the release of the existing Longue Hougue Reservoir for inert waste once the additional water storage became available.

### Dual Use of Les Vardes Quarry

Two main issues were identified:

- Known and yet to be identified water quality risks that would extend beyond the life of any engineered solution to separate water from waste;
- Converting a waste facility into a reservoir would undermine trust in the public water supply.

No precedent could be found for converting a waste disposal facility into a reservoir, so no standards could be found to inform how to develop this option in a way that would be safe for the public water supply. Consideration was given to capping the waste material and lining the reservoir to prevent groundwater ingress. However, none of these options had a satisfactory design life given that the reservoir could be expected to last indefinitely.

Whilst strict quality controls and environmental monitoring may ensure only inert waste was accepted for disposal, this waste would not be inert from a drinking water quality perspective. Building materials contain chemicals that provide weatherproofing, stain resistance and flame retardant properties for example. There is also a risk they contain chemicals that are

not currently subject to drinking water quality standards but will be in future.

The dual use of Les Vardes Quarry was therefore discounted by the CftE&I in light of these concerns about the potential impact of inert waste on drinking water quality, as well as the reduction in capacity caused by partial filling, and the strategic value of other inert waste disposal options.



**No precedent could be found for converting a waste disposal facility into a reservoir, so no standards could be found to inform how to develop this option in a way that would be safe for the public water supply.**

### Release of Longue Hougue Reservoir

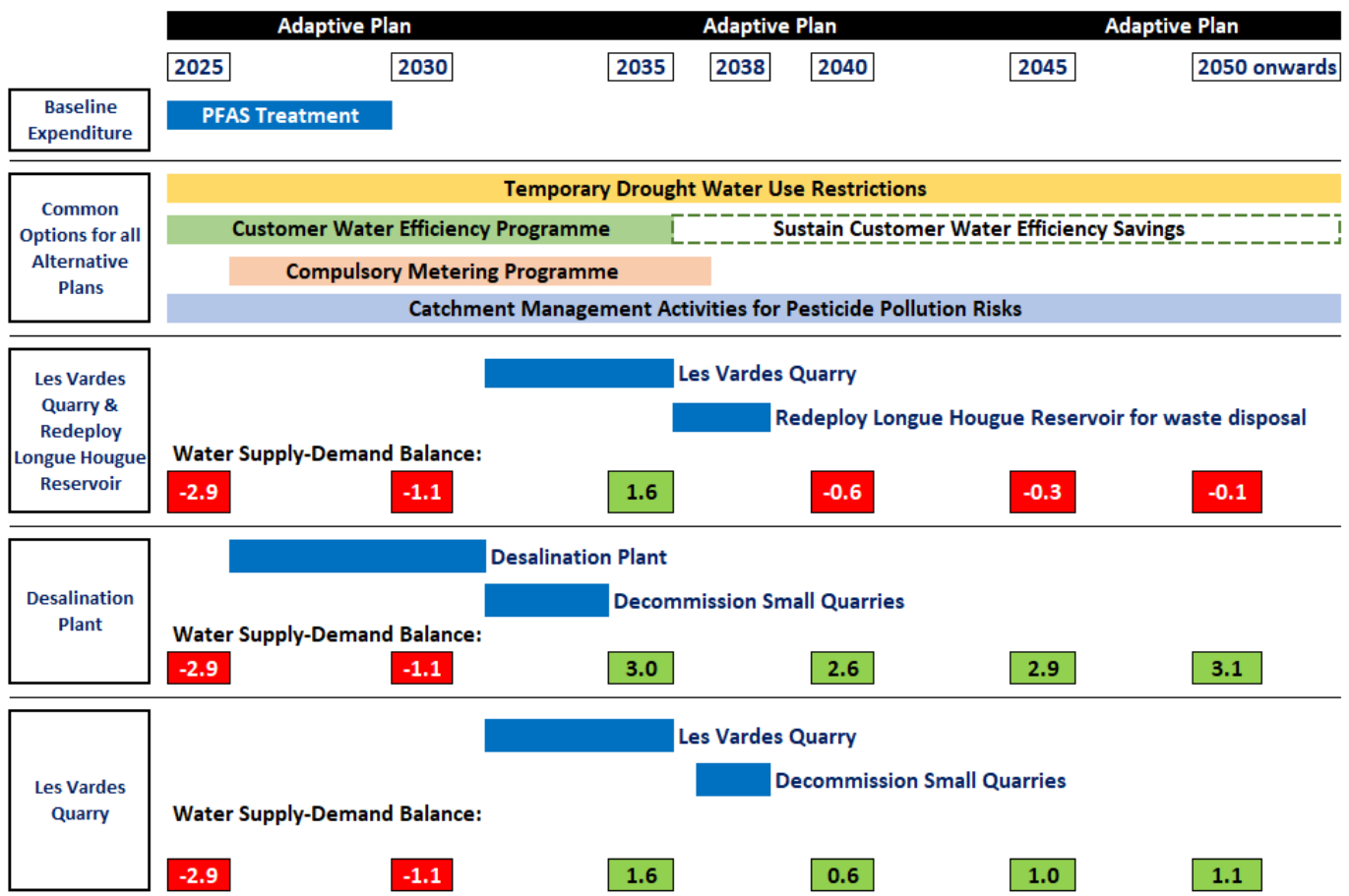
Longue Hougue Reservoir is the island's largest reservoir, providing 27% of current storage capacity. It could only be released if Les Vardes Quarry were developed first to offset this loss. This would result in a net increase in reliable water supplies in a drought of 1.1

million litres per day. That would not fully eliminate the supply demand shortfall, with a small deficit of around 0.1 million litres per day remaining in 2080 (Figure 2). This would not leave any headroom to accommodate population growth that is above that allowed for in current States of Guernsey policy.



**Longue Hougue Reservoir is the island's largest reservoir, providing 27% of current storage capacity. It could only be released if Les Vardes Quarry were developed first to offset this loss.**

**Figure 2. Supply demand benefit of adaptive plan options.**





## Evaluating the Adaptive Plans

Each of the adaptive plan options has been assessed using a multi-criteria evaluation approach (Figure 3). The different assessment criteria are not weighted and are evaluated according to an assessment scale ranging from positive to major adverse effects.

This evaluation indicates:

- Whole-life cost is highest for the desalination plan and there are significant concerns relating to the affordability of this plan for customers. There are also environmental concerns relating to construction and operation of the desalination plant, such as the potential impact of the associated brine discharge. Desktop research suggests that this can be mitigated, but at additional cost.
- Only the desalination plan would be resilient to a major outage such as the loss of Longue Hougue Reservoir (capacity 1.9 million litres per day) for an extended period due to contamination.
- Redeployment of Longue Hougue reservoir has the next highest whole-life cost. This is due to the need to redirect pipework from Guernsey Water's largest water collection station to a new Les Vardes reservoir. Water customers would not benefit from this work, so there is strong case for them not being required to fund it. It also does not fully address the shortfall over the planning period; so it is the least favourable plan for water supply reliability. This plan would not allow for the decommissioning of several smaller reservoirs which is a feature of other Les Vardes and desalination adaptive plans, to realise savings of £240k a year in operating costs.
- From a water strategy perspective, developing a new Les Vardes Reservoir while retaining Longue Hougue Reservoir has the lowest cost, least amount of risk, and lowest impact of all the options considered.

**Figure 3. Evaluation summary of the adaptive plan options.**

### Key

Positive effects

Negligible impact/risks

Low impact/risks

Medium impact/risks

High impact/risks

| Adaptive Plan   | Finance-ability     | Affordability       | Resilience & Reliability | Income Impact (if no change to charges) | Environmental & Social | Delivery Risks      | Customer & Political Acceptability | Operational Risks       |
|---|---------------------|---------------------|--------------------------|---|------------------------|---------------------|------------------------------------|-------------------------|
| Les Vardes Quarry and redeploy Longue Hougue Reservoir, with demand management & catchment management for pesticide risks | Medium impact/risks | Medium impact/risks | Medium impact/risks      | Medium impact/risks                     | Low impact/risks       | Low impact/risks    | Low impact/risks                   | Negligible impact/risks |
| Desalination plant with demand management & catchment management for pesticide risks                                      | High impact/risks   | High impact/risks   | Low impact/risks         | Medium impact/risks                     | High impact/risks      | Medium impact/risks | Low impact/risks                   | Medium impact/risks     |
| Les Vardes Quarry with demand management & catchment management for pesticide risks                                       | Low impact/risks    | Low impact/risks    | Low impact/risks         | Medium impact/risks                     | Low impact/risks       | Low impact/risks    | Low impact/risks                   | Negligible impact/risks |

## References

- <sup>1</sup> Policy Letter - Future strategic use of Les Vardes quarry
- <sup>2</sup> [National Infrastructure Commission \(2018\) Preparing for a drier future: England's water infrastructure needs](#); [Environment Agency \(2023\) Water Resources Planning Guideline](#); [National Infrastructure Commission \(2023\) Second National Infrastructure Assessment](#).
- <sup>3</sup> [Population & Immigration Policy Review - States of Guernsey](#)
- <sup>4</sup> [State of the UK Climate 2023 - Kendon - 2024 - International Journal of Climatology - Wiley Online Library](#)



States of Guernsey  
Trading Group



GuernseyWater

PO Box 30  
Brickfield House  
St Andrew  
Guernsey GY1 3AS

[www.water.gg](http://www.water.gg)  
01481 229500  
[customer.service@water.gg](mailto:customer.service@water.gg)