

**SHIPPING CONTAINER WITH
OPEN FRONT SHELTER AND
COVERED SEATING AREA FOR
USE AS SHOP/CAFÉ
AT BROWNS FARM, HENFIELD**

**WATER MANAGEMENT AND
MAINTENANCE PLAN**

February 2025





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1 INTRODUCTION

- 1.1 This water management and maintenance plan has been prepared to accompany application **DISC/24/0073** for the discharge of condition three under application **DC/22/0083**.
- 1.2 This report accompanies the Water Neutrality Statement to provide context on how the rainwater system will be managed.
- 1.3 As stated within the Guidelines for Drinking Water Quality: Small Water Supplies prepped by the World Health Organization a variety of supplies fall under the category of small water supplies. Where it states ***“These supplies may serve one household or a number of premises (e.g. households, businesses, schools and health care facilities) in rural areas, small towns..”***
- 1.4 Therefore this Water Management and Maintenance Plan has been prepared on the basis of the Site being treated as a small water supply.
- 1.5 The basis of managing and maintaining water supplies is set out in Section 4 of the Guidelines for Drinking Water Quality by the World Health Organisation which are:
- **Water supplier leadership.** Implemented directly by those who are responsible for operating and managing the water supply.
 - **Prevention.** Identifying and addressing risks to prevent problems from occurring.
 - **Multiple-barrier Protection.** Minimising contamination through source water protection, effective treatment (where applied) and safe distribution, storage and handling practices.
 - **Progressive improvement.** Making stepwise and risk-based improvements to water safety that can be initiated with any level of available resources and continuously strengthened over time.
 - **Ongoing monitoring.** Undertaking ongoing operations, maintenance and monitoring to keep water supplies safe.
- 1.6 Guidance for this Water Management Plan has been taken from:
- (i) Drinking Water Inspectorate; and
 - (ii) Guidelines for Drinking Water Quality by the World Health Organisation.
- 1.7 Therefore this report will cover the management and maintenance information required in association with the rainwater harvesting unit at Browns Farm, Henfield.

2 SAMPLING AND INSPECTION

- 2.1 Sampling and Inspections will allow for the condition of the equipment and water to be continuously checked and monitored.
- 2.2 The Water Supply falls under Regulation 9 which applies to all private water supplies. Regulation 9 Water Supplies supply:
 - a) an average daily volume of water of 10m³ or more for domestic purposes (NB where volume cannot be ascertained this equates approximately 50 persons or more);
 - b) water as part of a public or commercial activity.
- 2.3 The monitoring of a Regulation 9 supply must be carried out in accordance with Schedule 2 to the Regulations and to carry out any additional monitoring that the Risk Assessment finds to be necessary.
- 2.4 The Regulations explain that the key principles in place for the monitoring system is both a risk assessment and mitigation. Sampling is still vital requirement however, sampling alone cannot always provide assurance for a safe supply.
- 2.5 Monitoring provides information on the condition of the supply at a specific moment in time at a specific point in the system. This can be critical to identifying points in the system where the water supply may not be meeting standards.
- 2.6 Regulation 9 monitoring is complex and the entire supply of water needs to be monitored in accordance with Regulation 9 guidelines.

Inspection and Risk Assessment

- 2.7 The most important inspection and sampling that should take place frequently (once a week) is a sanitary inspection.
- 2.8 The sanitary inspection is an onsite inspection that evaluates the current risks on Site. Results from this can feed into a Risk Assessment or a Water Safety Plan (WSP).
- 2.9 The Risk Assessment runs alongside the monitoring and provides guidance for areas that are a priority to be assessed and sampled. The Risk Assessment can only be completed by a trained and competent professional.

- 2.10 Under the Regulations the Risk Assessment can **only** be completed by a professional who is fully trained to do so. This would be carried out upon the installation of the equipment.
- 2.11 The Risk Assessment will be followed using the Drinking Water Inspectorate Risk Assessment Tool for Regulation 9 connections. The Risk Assessment layout can be found in **Appendix KCC1**. The full Risk Assessment Document has been submitted with this report.
- 2.12 Once the risks have been identified, if there are any, then they can be controlled, managed and monitored. This can be done following a checklist procedure including dates of inspection, who has inspected. what has been inspected and any noted that need to be made.
- 2.13 The checklists should then be retained and written copies kept as evidence if required.
- 2.14 When the equipment is initially installed a maintenance inspection will be carried out by the professional installing the equipment.
- 2.15 The equipment is designed in a way to ensure that the end user is able to carry out maintenance and inspections with no further assistance. Therefore, it is intended that the responsibility for maintenance, inspections and sampling will be of that Applicants.
- 2.16 However, should the Applicant wish a fully trained and certified plumber can carry out the regular inspections and maintenance for them, if required.

Monitoring Parameters

- 2.17 The private water supply regulations require all water supplies that:
- (i) supply a volume of greater than 10m³ per day; and/or
 - (ii) are used as part of a public or commercial activity (regulation 9)
- It must be monitored in accordance with both Group A parameters and Group B parameters.
- 2.18 The Group A and B parameters are set out within the Drinking Water Inspectorate Guidance. The parameters can be seen below.

Table KCC1. Monitoring Parameters

Monitoring of Group A Parameters	Monitoring of Group B Parameters
Determine whether or not water complies with the concentrations or values in schedule 1 of the Regulations	Determine whether or not the water complies with the concentrations or values in part 1 or 2 of Schedule 1 of the Regulations, other than Group A parameters already being sampled under part 1 of Schedule 2 (the standards and indicator parameters).
Provide information on the organoleptic (taste, odour and appearance) and microbiological quality of the water.	
Establish the effectiveness of the treatment, including disinfection.	Check (where disinfection is used), that disinfection by-products are kept as low as possible without compromising the disinfection.
The parameters coliform bacteria, colony counts 22°C, colour, conductivity, E-Coli, hydrogen ion (pH), odour, taste, turbidity must be monitored in all regulated supplies as Group A parameters, at a frequency dependent on the size of the supply	

- 2.19 There may be a reduction in the sampling frequencies required for a parameter, or cease to monitor a parameter (other than E.Coli), but this can only be done so in accordance with the conditions specified in Part 2A of The Private Water Supplies (England) (Amendment) Regulations 2018.

Sampling

- 2.20 Where the testing frequency for both Group A and B parameters is once per year, the sample/s for each may be taken either in a single visit (via one or more separate samples) or on two separate visits at different times of the year. For the purposes of good practice, it is advised that Group A and B samples are taken at different times of the year.
- 2.21 For reporting purposes, it is important to remember that *each individual parameter test* must be **either** for a Group A parameter **or** a Group B parameter even if a single sample of water is tested for parameters in both groups.
- 2.22 Sometimes the same parameter may appear in both the Group A and the Group B specifications. If this is the case, that parameter does not need to be tested against the Group B specification, if it is already being tested against the Group A specification.

- One or more samples of water may be taken in a sampling visit.
 - Each of those samples may be tested for either Group A or Group B specifications, or a combination of both.
 - The number of samples is irrelevant. To comply with the regulations, each parameter must be tested at the correct frequency determined by the Group A and Group B specifications.
 - For reporting purposes, it is important to be clear on each sampling visit, which tests will be carried out on each sample, and against which specification, Group A or B.
- 2.23 The location of the sampling must ensure that the sample best represents any hazard identified on the risk assessment.
- 2.24 With regards to sampling it is important to note that every part of the rainwater harvesting process needs to be sampled, tested and monitored. This is because if you are solely testing the water that is directly ready for consumers to drink, by the time the contamination has been detected, consumers may have already drunk some of that water. Therefore, reliance cannot be had solely on the end product.
- 2.25 The frequency of testing and sampling depends on the location and the risks that are assessed. Supplies that are serving more consumers may require more frequent testing than a singular household supply as it is exposing the risk to more people.
- 2.26 The frequency of the sampling will also be a reflection of the risks identified at the Site. The frequency of sampling is likely to change throughout the year as a reflection of the change in climate and how that can impact the water.
- 2.27 The samples should be taken from both the point of collection (i.e where the water begins to connect to the system (water tank) and the point of use (where the treated water comes out of).
- 2.28 Sampling will be undertaken by a DWI certified sampler and analysed by a UKAS accredited laboratory.

Failed samples

- 2.29 Should the samples contain too high of a quantity of the contaminant being tested for, then the water use must cease until it is dealt with accordingly. Water use will not continue at the Site until two clear samples have been provided.
- 2.30 At the time of a failed sample and investigation will be required. The investigation will determine:
- (i) where in the system the failure has occurred and/or allowed the contaminants in;
 - (ii) whether there is an issue with the system resulting in the contaminants being let in, such as a failure of equipment (i.e. split or break in equipment);
 - (iii) the level of severity of the contamination and;
 - (iv) mitigation measures to prevent future contamination from this point.

Investigation Procedure

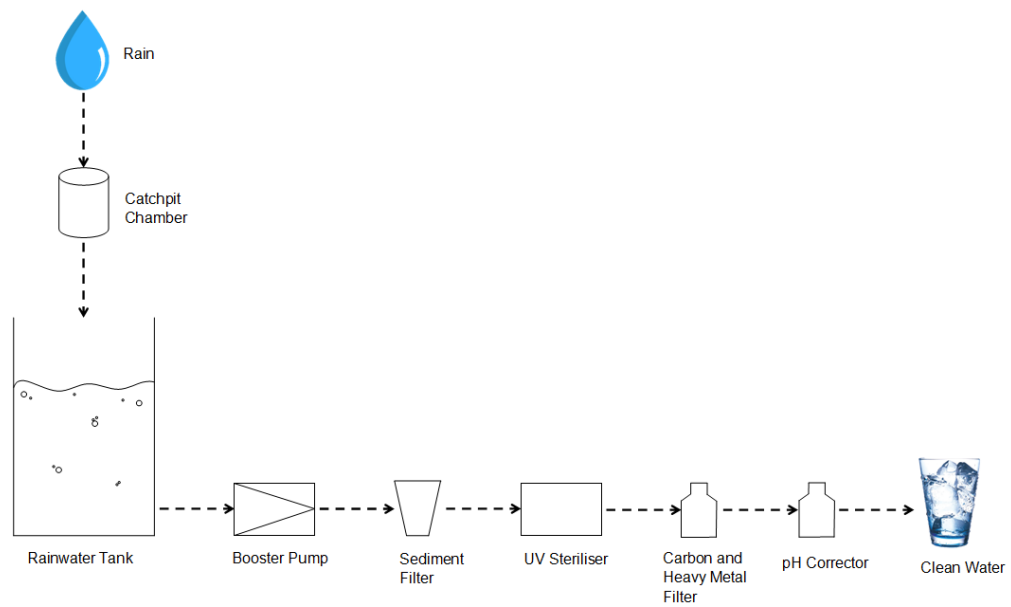
- 2.31 As soon as there is reason to believe that a water supply has failed or there has been a failed sample an investigation must be undertaken into the cause of that failure. This investigation is carried out Under Regulation 18(1) of the Drinking Water Inspectorate Guidance.
- 2.32 When an investigation is undertaken the primary concern should be ensuring that all consumers are protected. Following this a risk assessment will be undertaken to establish what has caused the failed sample and whether this is a piece of faulty equipment, an activity or operational issue. The extent of the failure must then be identified. Such as are samples at a certain point not contaminated, which can focus the investigation on to a specific part of the system.
- 2.33 Following the investigation and identification of the cause and source of the issue, restoration must be made to the supply and clear samples made.

3 DETAILS ON THE PLAN OR SCHEMATIC

- 3.1 The proposal seeks to put in place a rainwater harvesting system which will utilise the roof space of the existing café unit at the Site to collect the rainwater.
- 3.2 In order to ensure that there would be enough roof space available and the correct supply a Water Neutrality Report was undertaken by CGS Civils to calculate the requirements to ensure that the Site is not only water neutral, but also that the scheme being put forward is feasible. The Water Neutrality Report can be found in **Appendix KCC2**.
- 3.3 The Water Neutrality Statement concluded that the scheme is feasible, and the supply of water will be sufficient, as calculated through the general rainfall within the area and quantity of water used at the Site.
- 3.4 The water will then be collected and fed through a filter to remove any debris which has been collected from the roof, into a water storage tank. The tank which will be used on Site will hold up to 5000 litres of water.
- 3.5 A bypass mechanism will be in place to exclude the first flush of rainwater from the roof from being used for human consumption. This will ensure that any long standing sediment that has built up on the roof of the container prior to the rainwater harvesting installation will be excluded from use. This bypass mechanism will be used whenever the system has not been in use for an extended period of time (over 24 hours).
- 3.6 The water will go through a process for treatment, which is described in Section 4 of this document. The treatment process will ensure that the rainwater is safe for human consumption.
- 3.7 In order to ensure that the Applicant is able to monitor the use and consumption of water and record how much water is still remaining within the tank, a monitor can be installed on the tank. The monitor will allow the Applicant to view how much water remains in the tank as well as an average on how much water has been used from that tank during the day.
- 3.8 This will allow the Applicant to determine whether there will be a risk of the water availability running low to ensure if that is the case, there will be a contingency plan in place that will be actioned. The contingency plan is addressed in Section 7 of this document.

3.9 A diagram which shows how the system will work is shown below.

Insert 2. Rainwater Harvesting Schematic Diagram



4 DETAILS ON TREATMENT

- 4.1 The rainwater harvesting system proposed includes the collection of rainwater run off from the roof of the café. This will then feed into the water tank where it will be treated.

Treatment of the Water and Equipment to be used

- 4.2 Due to the water being collected from the roof of a shipping container, there is likely to be contaminants. These contaminants include:
- Silts;
 - Dust;
 - Bacteria;
 - Nitrates;
 - Organics; and
 - Corrosive water.
- 4.3 These contaminants include those that are derived from the metal finish of the shipping container.
- 4.4 Therefore a system needs to be installed that can overcome and treat each of those contaminants to ensure that it is safe for human consumption.
- 4.5 In order to do this initially the system will include a Catchpit Chamber. A Catchpit Chamber is designed to collect any dirt, silt or debris that could be initially within the water to prevent it going into the water tank or pipes. This will therefore remove the Silt contaminant.
- 4.6 The next piece of equipment will be a sediment filter. The sediment filter is designed to filter out any contaminants such as dust that may be within the water. This will therefore remove any dust contaminant from the water.
- 4.7 The treatment would also include the use of UV treatment, also known as the UV Steriliser. A UV steriliser enables untreated water supplies to become safe to drink by killing any bacteria or microorganisms. These are often also used for untreated water supplies such as wells, springs and boreholes. This then removes the bacteria contaminant.

- 4.8 There will also be a carbon and heavy metal filter put in place this will remove any metals such as nitrates from the water. This carbon element of the filter will then remove any organics. Therefore, these contaminants are removed.
- 4.9 Finally a PH corrector is installed this will ensure that any water going past this point is neutralised.
- 4.10 Each part of this process will then ensure that the water is not corrosive. Corrosive water is caused by a number of contaminants and a low PH value.
- 4.11 Therefore, each of the contaminants that could be an issue are treated.
- 4.12 In addition to the above further equipment will be installed. This includes an Aerator which will be within the rainwater tank. This will then introduce oxygen within the water tank and keeping air bubbles in the liquid much longer. By installing this it will prevent stagnation and in turn result in cleaner water.
- 4.13 From the water tank there will be a booster pump which will increase water pressure and ensure that the water travels through the rainwater harvesting system.
- 4.14 Generally any pipework chosen to be used will be substantial. The most common used pipework is the 25mm MDPE. However, the only pipework that would not be sufficient would be copper piping due to the corrosive nature of the water.
- 4.15 A breakdown on each piece of equipment including the specification of the equipment can be found at the back of this report in **Appendix KCC4**.

Cleaning and Maintenance

- 4.16 Cleaning and maintenance of the rainwater harvesting system will ensure the longevity of the lifespan of the system.
- 4.17 The key parts of the system that need to be checked and cleaned include:
- Pipework
 - Filters
 - Tank
 - General overview

- 4.18 **Pipework.** The pipework will need to be checked. This means any pipework that the water is travelling through. Checking this will make sure there is nothing obstructing the water getting through the system. It is recommended that any pipework is cleaned thoroughly **every six months**.
- 4.19 **Filters.** The filters will need to be checked and all sediment emptied. Once emptied the filters will need to be cleaned to make sure all sediment is removed. The filters need to be **cleaned after every rainfall**.
- 4.20 **Tank.** A visual inspection of the tank is important to check for any stagnation (algae) that may be floating on the top of the tank. This will need to be removed if safely able to. This **will need to be completed weekly**.
- 4.21 **General Overview.** A general overview of the pipe work and the system needs to be carried out. This includes checking for any pooling or issues within the system where there are leaks or cracks. **This will need to be done weekly**.
- 4.22 Each of these checks and monitoring can be carried out by any member of staff. Training will be required for any new member of staff to ensure cleaning is carried out thoroughly. Training will be provided by the Applicant.
- 4.23 The maintenance throughout the lifetime of the development will be the responsibility of the Applicant. Should any issues arise during an inspection from a member of staff then this should be reported to the Applicant directly so that it can be dealt with accordingly.
- 4.24 Should at any time the system become deactivated due to lack of use or rainfall then it needs to be thoroughly cleaned before being completely emptied to ensure no bacteria or sediment is left in the equipment.
- 4.25 Depending on the length of time that the equipment has been left unused then prior to the equipment coming back into use and the water from the tank being used for human consumption, the equipment will be required to be thoroughly cleaned again.

Treatment of traces of other elements found within the water supply

- 4.26 It is recognised that under section 9 of the PWS (2016) regulations that there are a wide range of parameters that require testing. Not all of these are stated within this treatment plan.

- 4.27 Throughout the sampling process of the water supply if elevated levels or traces of other elements are found within the water supply that information will be recorded in line with the details as set out in Section 8 of this report.
- 4.28 If the samples are found to be of a level that means that they fail the testing then an investigation will be undertaken in line with 2.31.
- 4.29 Appropriate treatment will either be installed or undertaken and water use will cease until that treatment is in place.
- 4.30 At this point further sampling points will be added around the installed equipment.

Treatment for an increase in water use

- 4.31 As per point 3.7 the equipment will include a monitor that will allow the Applicant to see how much water is being used at the Site. Should the water use increase at the Site treatment parameters will be amended accordingly.

5 RISK ASSESSMENT AND WATER SAFETY PLANS

5.1 A risk assessment is required to determine the potential risks with regards to the equipment used.

5.2 As stated within the Drinking Water Inspectorate in line with the Private Water Supply (England) Regulations (2016) a Regulation 6 Risk Assessment is required to be completed by a suitably competent person prior to the water supply being put into use.

However, a regulation 6 risk assessment is for private dwellings. As this is a commercial business the risk assessment is required to cover regulation 9.

5.3 The Risk Assessment and Water Safety Plans will be used following the guidance issued by the World Health Organization and will be prepared and completed by the water specialist who installs and monitors the equipment.

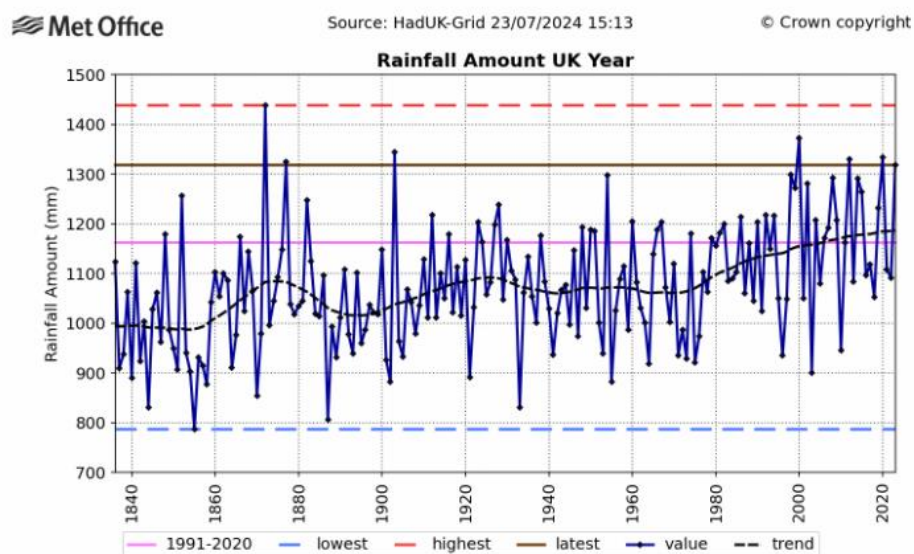
5.4 An example of the forms that will be used can be found in **Appendix KCC1**.

5.5 The risk assessment can only be completed by a qualified professional. Therefore, following the granting of the permission the risk assessment will be undertaken by the water body and equipment manufacturers.

6 WATER SUPPLY

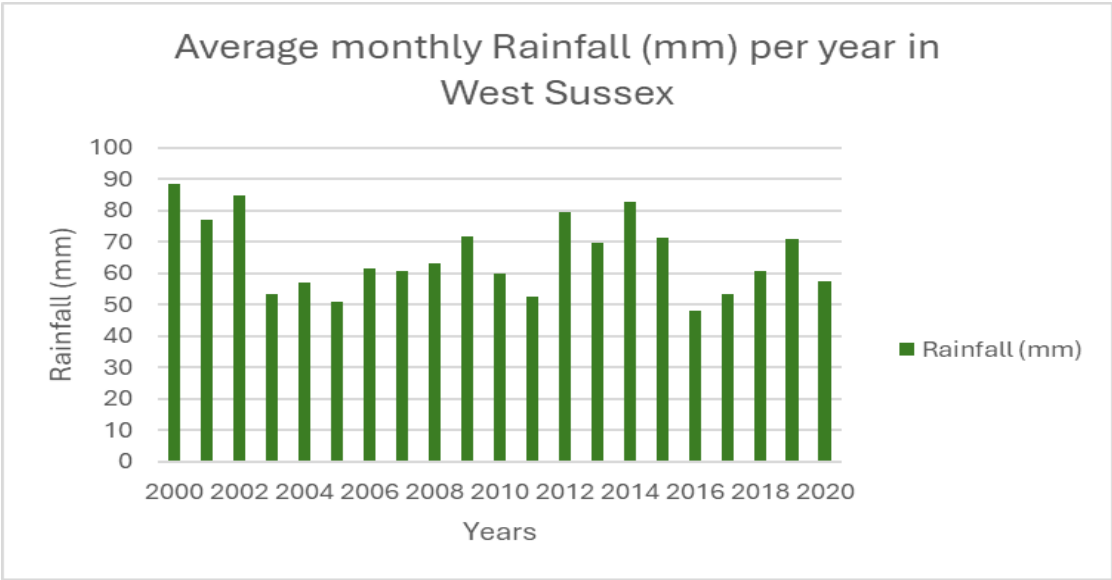
- 6.1 It must be considered where the water supply will come from should we find ourselves in a position where we have not had rain for 35 days continuously. As this would mean that no water is being collected to be harvested and used.
- 6.2 It has been explained previously in the Water Neutrality Report (which can be found in **Appendix KCC2**) that the estimate water usage of the development will be approximately 50 litres of water per day.
- 6.3 The water tank to be installed will be a 5000 litre rainwater harvesting tank. Initially for the installation the Applicant will import water from a region that falls outside the Sussex North Water Resource Zone. The proposed size of tank and equipment will allow for a 60 day drought period. Thus, providing a contingency for well in excess of a 35-day period without rain.
- 6.4 Rainfall has to be assessed to determine the risk that the contingency of a larger tank may not be acceptable. When looking at climatic data sets from the Met Office for the UK. It can be seen that we are seeing increases in the quantity of rainfall. With the lowest amount of rainfall recorded in the latest years being just under 1,100 mm which is dramatically different from the results from between 1850-1860, where the lowest results were approximately 800mm of rainfall. This can be seen on the graph below.
- 6.5 Thus, showing a larger contingency tank is not necessary.

Insert 3. Average Rainfall per year for the UK



- 6.6 From this we can determine that we are seeing national increases in rainfall and lower risks of periods of drought.
- 6.7 It must be noted that these results are national. Therefore, an assessment has been made using the UK climate averages from the Met Office for West Sussex to determine the fluctuations in the rainfall levels each year over a 20 year period.
- 6.8 The results found that whilst the results have fluctuated the lowest average recording was taken from 2016 when an average of 50mm of rainfall was measured per month. Therefore, we can determine that it is unlikely there would be a period where there would be concern for water levels.

Insert 4. Average monthly rainfall per year in West Sussex



- 6.9 Recognising that there does need to be a contingency in place an emergency connection to the mains water will be supplied and use monitored. This will not affect the rainwater neutrality issues as there is no expectation that the Applicant will be required use to the mains. However, should there be an unfortunate situation where it is that we are going more than 35 days without rain, then the Applicant will be required to supply water from off of the Site, which may have to come from a mains source (away from the Site itself).

7 CONTINGENCY PLANNING

- 7.1 A contingency plan will be in situ should there be an issue with the water supply at the Site.
- 7.2 Should a member of staff have any concerns with the water supply, this should be reported to the Applicant at any time. This will then trigger an investigation into the water system immediately.
- 7.3 Should the issues not be able to be remedied within a 24 hour period internally by the Applicant, then contact will be made to the most appropriate body for assistance. At this time, a timeframe will be provided for the rectification of the issue.
- 7.4 Should an investigation need to be undertaken and actions taken the Applicant will inform the LPA of such actions and timeframes for the restoration of the supply.
- 7.5 Should water be unavailable for a short period of time (24-48 hours) then bottled water, purchased from a wholesaler will be used to ensure no unnecessary use. However, if it is longer than the 24–48-hour window, then contact will be made to the Local Authority to discuss next steps.
- 7.6 As stated previously, a system will be in situ with a connection to water mains, if required in the case of an emergency. Therefore, it will be for the Council to confirm:
- i) whether the use of the mains water would be sufficient; or
 - ii) whether it would be appropriate for the Applicant to continue to purchase and use bottled water from a wholesaler.

8 RECORDING

- 8.1 As set out in the Drinking Water Inspectorate Guidance by the 31st January of each year each local authority is required to send to the Inspectorate a data return for the private water supplies within the area as part of the regulatory obligations.
- 8.2 A template of this can be found in **Appendix KCC5**. The full document has been submitted alongside this report.
- 8.3 In addition to this, the use of the water equipment as well as the safety of the water being stored and used will be monitored on Site.
- 8.4 All of the testing and checks will be recorded to ensure that in the case of any unforeseen circumstances or issues, there is a written record which includes the following:
- (i) **Date.** The date when the testing/check had taken place
 - (ii) **Result.** The result of the testing/check
 - (iii) **Action.** Commentary on whether any further action is required.
 - (iv) **Identification.** The name and signature of the person who undertook the test/check of the equipment.
- 8.5 The following information will be recorded and available as evidence if required.
- 8.6 **General inspections.** This includes the regular inspections carried out by the Applicant or a member of staff to ensure that there are no issues with the equipment that has been installed or anything that needs to be noted such as a leak in the system or a low quantity of water available.
- 8.7 **Inspection of equipment by other professional bodies.** Any inspections of equipment by professional bodies will be recorded and details held on file. This will include events where the Applicant has asked for maintenance or other professional bodies to carry out works to the equipment.
- 8.8 **Sampling/Testing.** Any sampling or testing that has taken place will be recorded. This will be to assist the Applicant with ensuring that all sampling and testing is up to date and to be able to review when a test was previously done to see if it is due again. This information will also be of assistance in the case of an issue or an outbreak as evidence that the Applicant has had tests done. The date of a clear test to the date of the issue can pin point when the issue began or how long it has been ongoing.

- 8.9 **Results and Analysis.** Results and analysis of the sampling and testing will be held on file. The requirement for this is similar to that of the sampling and testing information.
- 8.10 **Concerns and Comments.** Any concerns and comments with the system will be recorded. This includes any slight differences in the running of the system. This means that if there are a number of recordings of concerns that are of a similar nature, the Applicant will know that the system needs to be investigated further.
- 8.11 Overall, the recording will allow the Applicant to monitor the running of the system, as well as it providing evidence of the upkeep of the system and the general maintenance and testing of the water.
- 8.12 All of this recording will be retained for a minimum of seven years for review if required.

9 KEY ADDRESS

9.1 Overall, the key points to take away from the document are listed in turn.

9.2 **Sampling and Inspection**

- (i) an inspection should take place once a week;
- (ii) the frequency of the sampling will be dependent on the risk assessment;
- (iii) sampling will be undertaken at a laboratory to ensure accurate results; and
- (iv) any failed samples will mean water use is ceased until the issue is rectified.

9.3 **Treatment**

- (i) the treatment of the water will ensure that it is safe for human consumption;
- (ii) the cleaning of the system will ensure the longevity of the system;
- (iii) the pipework will need to be cleaned every six months;
- (iv) the filters will need to be cleaned after every rainfall; and
- (v) a visual inspection of the equipment will need to be carried out weekly.

9.4 **Risk Assessment**

- (i) a risk assessment will be carried out by the installer of the equipment on the date of which the equipment is installed; and
- (ii) the risk assessment will provide details including when sampling and inspections should take place dependent on the risks on site.

9.5 **Recording**

- (i) all information regarding the equipment, installation, testing and sampling will be held on file, including invoices, services and the risk assessment;
- (ii) any sampling or testing undertaken on site will be recorded and information such as the date, result, action required and who undertook the work will be noted;
- (iii) recorded data will include general inspections, inspection of equipment by other professional bodies, sampling/testing, results and analysis and any concerns or comments that need to be noted; and
- (iv) all records will be retained for seven years.

**Appendix KCC1.
Risk Assessment
(Drinking Water Inspectorate,
Regulation 9 Template)**

Private Water Supply: Risk Assessment Lite Tool



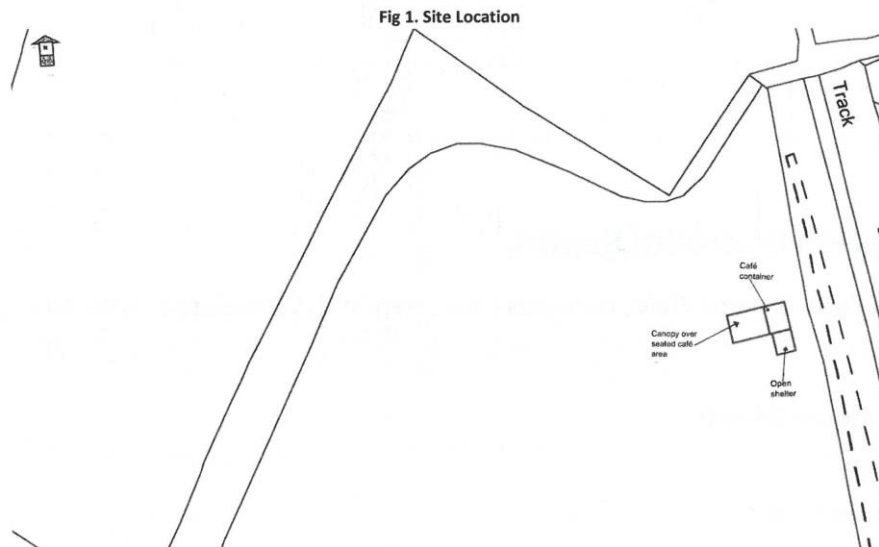
V 2.11

Local Authority:		Supply Reference:		Supply Name & Address:		
Estimated daily volume of water supplied (m³ per day):		Normal number of consumers served (maximum):		Date of Risk Assessment (DD/MM/YYYY):		
Regulation Supply Type:					Assessor:	
Addresses of connected sites						
Name of person / organisation	Relevance	Telephone number	Address	Email	Purpose	Comments
Description of Supply						
Details of source		Location		Grid reference		
Details of any water treatment processes present:						
Other: please enter details						

**Appendix KCC2.
Water Neutrality Report**

1 Introduction

- 1.1.1 CGS Civils Ltd has been appointed by Mr Kieran Berrett to undertake a Water Neutrality Report for a proposed development at The Café, Browns Farm in Henfield, West Sussex. A planning application has been submitted to Horsham District Council, under the ref DC/22/0083 for the retrospective application for the installation of a shipping container to form a café.
- 1.1.2 The purpose of this report is to therefore provide an overview on the potential water usage changes on the site as a result of the proposed development, and to confirm that the site is water neutral.
- 1.1.3 The proposed development is located at OS Grid Reference TQ 20700 15686 and has the post code BN5 9UX



- 1.1.4 Waterwise defined Water Neutrality as:

'For every new development, total water use in the region after the development must be equal to or less than the total water uses in the region before the new development.'

- 1.1.5 Achieving water neutrality involves using a three-step approach. First, the demand for water from the new development must be reduced as far as is practicable, followed by the re-use of water; then the remaining demand should be offset within the region. Following this three-step approach allows the volume that requires offsetting to be reduced which ultimately reduces the cost of the overall scheme. This is noted within the Waterwise neutrality definition, which defines the three steps which should be undertaken in order to achieve water neutrality in their recent review dated January 2021.

- Reduce water demand in the new development through improvement in efficiency.
- Re-use water, wherever possible.
- Offset the remaining water demand from the new development if required.

- 1.1.6 The report will be split into the following sections:

- A Review of Water Neutrality demand reduction
- A calculation of estimate water usage from proposed development
- Identification of measures that can be first used to reduce this demand
- Identification of measures that can be used to re-use water
- Establish solutions to offset that demand in order to achieve neutrality.

- 1.1.7 This report will follow the methods documented within 'A Review of Water Neutrality in the UK' carried out by Waterwise in January 2021. The document provides details on how developments can achieve water neutrality by utilising the 3-stage approach.

Fig 2. 3-stage approach



- 1.1.8 Some increase in water demand within the region from planned development during the local plan period is inevitable. However, it can be minimised by making the site as water efficient as possible.
- 1.1.9 Per Capita Consumption (PCC) is used as a measure of water use and is the volume of water that is used by one person in one day. It is usually measures in litres per person per day (l/p/d). The average PCC within Southern Water's 'Sussex North Water Resource Zones (WRZ)' is 135 l/p/d. Homes without a water meter consume on average 160 l/p/d and for homes with a water meter, consume on average 131 l/p/d.
- 1.1.10 Part G of the Building regulations currently states that new build housing should achieve a minimum of 125 l/p/d. A tighter target of 110 l/p/d can be requested if the local authority can establish a clear need based on available evidence.
- 1.1.11 The table below indicates different demand scenarios including Southern Water's Target 100 Ambition to achieve 100 l/p/d, as well as further scenarios where water demand is cut more dramatically.

Table 1 PCC Demand Scenarios

Demand Scenario	Per Capita Consumption (l/p/d)
British Flows and Loads	150
Building Regulations Standard	125
Building Regulations Optional	110
Target 100	100
Realistic Achievable	85
Ambitious	62

1.1.12 The benefits of water neutrality are wide ranging, from financial and reputational to environment and social. For a new domestic building, they could include:

- **Saving Water** – Over 100,000 litres of water can be saved per year for each water neutral home built
- **Saving Carbon** – A significant CO2 saving can be achieved by reducing the demand for hot water for baths, showers, basins, dishwashers and washing machines
- **Saving Money** – Both water and energy bills will reduce
- **Reducing environmental impact** – Decreasing water abstracted from rivers and groundwater sources
- **Improved Resilience** – For the future by minimising the additional pressure on water resources
- **Enabling future housing growth** – In water scarce areas by reducing the impact of new homes and buildings
- **Reducing discharge to sewage** – by using less water, collecting rainwater and recycling greywater, less water is discharged to the drainage network
- **Short pay-back time** – After approximately 5 years the saving of water neutrality will outweigh the costs of doing so.

2 Calculation of estimate water usage from the proposed development

2.1.1 Before any necessary steps to achieve water neutrality can be determined, the total water demand for the proposed development must first be calculated. The proposed scheme will consist of a conversion of a shipping container into a café with outdoor seating area. It has been estimated that the café will serve 100 people per day.

2.1.2 As the property will only make use of a tap in order to provide hot drinks to customers, and to wash up crockery. It has been confirmed that the café will use a 25l bucket for washing up and that all hot drinks are served in 8 Oz cups (Rounded up to 0.25l)

$$(100 \times 0.25 \text{ l/p/d}) + 25\text{l} \\ = 50 \text{ l/day}$$

2.1.3 The following sections within this report will cover measures that can be undertaken in order to reduce the water consumption of the proposed property and aim for the 'Ambitious' PCC of 62l/p/d.

3 Step 1 – Identifying measures that can be used to reduce this demand

- 3.1.1 Due to the nature of the site, it will not be appropriate to fit water efficient devices as the same volume of water will be used regardless.

4 Step 2 – Identify measures that can be used to re-use water

4.1.1 Once the water demand has been reduced via the installation of water efficient products, water reuse should be considered. The term 'water reused' refers to the capture, treatment (if it is required) and the use of alternative water supplies for non-potable purposes. It includes:

- Rainwater and surface water harvesting
- Greywater recycling (typically the used water from baths, showers and hand basins)
- Wastewater recycling.

4.1.2 The installation of water reusing technology has the potential to save significant amounts of water; for example, 24% of water in the home is used for flushing the toilet and only 4% externally in the garden meaning a water reuse system could save at least a quarter of the demand if it was installed for these purposes. Depending on the quality and the system installed, it could also be possible to re-use water for a washing machine which accounts for 12% of total water usage.

Table 7 Practical Summary of Step 2

Step 2: Reuse Water			
Rainwater Harvesting	Small scale water butt	Rainwater Harvesting system for individual homes and buildings	Large scale surface water harvesting
Greywater Recycling		Small systems for individual homes	Largest scale systems for commercial and mixed-use sites

4.1.3 The installation of water reusing technologies will further reduce the water demand on site, depending on the harvesting tank installed. The proposed roof area is sufficient to provide the required water to the property via an above ground rainwater harvesting tank as well as has sufficient capacity for a 60-day drought period. It is proposed that the rainwater harvesting will be fitted with a series of filters in order to treat the rainwater and make it suitable for human consumption.

4.1.4 The client is looking to install an Enduramax 5000l rainwater harvesting tank which is to be located just outside the Café which will allow the client to store, treat and use rainwater for the property. A data sheet for the tank can be found in **Appendix B**. – For list of filters, see section 4.1.7.

4.1.5 In order to initially fill the rainwater harvesting tank, the client is going to import the water from a region that falls outside the Sussex North Water Resource Zone. It is also recommended that the roof, rainwater goods and harvesting tank are to be installed early on in the scheme to allow for the tank to begin harvesting rainwater.

4.1.6 By installing the water efficient devices listed above as well as the rainwater harvesting system listed above, the total demand will be reduced to **0 l/day**.

4.1.7 The client is willing to install a 5,000l rainwater harvesting tank in order to achieve self-sufficiency within the property. The harvesting tank is to be fitted with the following equipment in order to get the rainwater to a level safe for human consumption.

- Aerator – This is to keep the water fresh
- Lowara 0.55 kW variable speed booster set
- PREFILT103/4 10" prefilter housing
- CRT10SW-05 5 micro sediment filter
- UV-CS165 ultraviolet steriliser (3 lamps to be replaced every year)
- WH1MH Whole house water filter (filter media to be replaced every 2 years)
- 10" x 54" pH correction unit (media to be replaced every 1-2 years)

4.1.8 Due to the proposed rainwater harvesting tank and filtration system, there is no need to install a water main to the property – as such this means the proposed site will not require a Water Neutrality report (based on Natural England's definition below) and will also be water neutral.

"The water neutrality approach applies to all development that uses water from the Sussex North water supply zone and specifically the Pulborough abstractions it is not restricted to new residential dwellings and may include other forms of development that use the public water supply. Whether an application is included would depend on what water supply is chosen. **Only development that uses public water supply from Sussex North water supply zone is included in the Statement. Many of the types of development that use water that the County Council permit do not use public water supply and would therefore not be covered by the Statement.** It is for the local planning authorities including the County Council to identify which types of development they believe may be captured."

5 Conclusion

5.1.1 The overall water demand can be reduced by utilising methods listed in the sections above to reduce and re-used water for the proposed development. This results in the site being water neutral.

5.1.2 To summarise:

- The proposed development will use on average **50 l/day**.
- Re-using the water through rainwater harvesting tanks can further reduce the water demand down to **0l/day**
- The overall water demand will be reduced, and the site will become water neutral.

6 Appendices

6.1 Appendix A:

Rainwater Harvesting tank size calculator:

COLLECTABLE ROOF AREA (M ²)					
Main Building	Width:		Length:		Rain Collection Area: 0 m ²
Extension one	Width:		Length:		Rain Collection Area: 0 m ²
Extension Two	Width:		Length:		Rain Collection Area: 0 m ²
Extension Three	Width:		Length:		Rain Collection Area: 0 m ²
Or the total roof area, if you already know it:			96	Total area of collectable roof space: 96 m ²	
Select Your Region	England SE & Central SW			Average rainfall per year in your region: 64 L	
Collectable rainwater per annum in litres - discounted by 20% to account for water loss					49152 L

USE OF RAINWATER IN THE BUILDING					
Number of people or bedrooms in the building -		people: 1	bedrooms: 0		
☐	Number of clothes washing cycles per day (50 litres each)	0.00 Cycles	0.00	L	
☐	Number of toilet flushes per day (4.42 flushes per person, average 5 litres each)	0.00 Flushes	0.00	L	
Outdoor use in litres, per person per day (recommended 5 litres per person per day)		50	50.00	L	
Amount of water you require every day			50	L	
Amount of water you require every year			DEMAND	18250 L	

FINAL FIGURES		
How many days drought protection do you need? Typically 21 (18 minimum)	60	
Capacity of water storage in litres required for drought protection	3000.00	L
The lesser of YIELD (blue) or DEMAND (green) per annum	18250	L
Therefore, volume of rainwater storage required	3000	L

CONCLUSION		
Is there sufficient roof water available:	YES	
Recommended tank size from our shallow dig range:	F-Line Range:	3000 LITRE F-LINE TANK

6.2 Appendix B:

Enduramax 5000l rainwater harvesting tank data sheet:

Think Tank. Think **ENDURATANK**

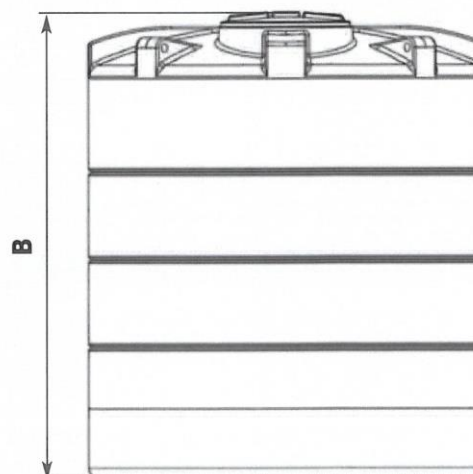
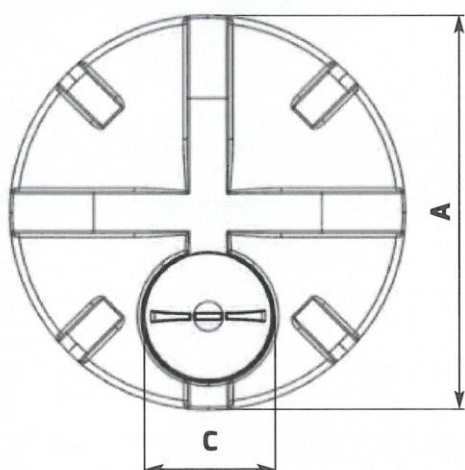
**NEED
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VERTICAL TANK TECHNICAL SPECIFICATION

POTABLE	172215	NON - POTABLE	172115
CAPACITY (Litres)	5000	CAPACITY (Gallons)	1100

A (mm)	1900	B (mm)	2300
C (mm)	620	Standard Outlet	2"



ENDURATANK

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**Appendix KCC4.
Rainwater Harvesting Equipment**

Item	Description	Lifespan
Catchpit Chamber		
Water Tank	Endurataank 5000 litre	
Booster Pump	Lowara 0.55kW variable speed booster	20 year lifespan
Filter	PREFILT103/4 10" prefilter housing	20 year lifespan
Sediment Fiter	CRT10SW-05 5 micro sediment filter	Needs to be replaced every year.
UV steriliser	UV-CS165 ultraviolet steriliser	3 lamps to be replaced every year
Carbon & Heavy Metal Filter	WH1MH Whole house water filter	filter media to be replaced every 2 years
PH Corrector	10" x 45" pH correction unit	media to be replaced every 1-2 years
Pipework	25mm MDPE pipe	

**Appendix KCC5.
Submission for the Drinking Water Inspectorate**

Submission information:

It is advisable to read the specification before completing the worksheets as this should help ensure all the data is entered in the correct format and location.

Once the data is added into the worksheets, they can be checked by using the VALIDATE button, which will identify if there are any errors in your submission.

To help you correct any errors, after you press the validate button, a list of errors (and an explanation) will appear on the instructions sheet.

Any errors must be corrected before you upload your data to the Inspectorate.

Remember to use the following file naming convention: XXX-privatewater-YYYY.xls

Where: XXX - Local Authority Food Standards Agency Code

YYYY - The year in which the data originated

For example, North Devon returning data for 2024 would be; 075-privatewater-2024.xls

Enquiries:

Where you have an enquiry that is not dealt with by the specification, please do not hesitate to contact the Private Supplies Team using:

dwi.enquiries@detra.gov.uk

Tel: 0330 041 6501

<http://www.dwi.gov.uk/>

Examples of Public Buildings:

Medical	Education	Hostelries	Exhibition	Sports	Miscellaneous
Hospital	School College	Cafes	Museum	Sports ground Stadium	Hairdresser
GP Surgery	Further Education	Pubs	Art Gallery	Leisure centre	Beauty salon
Dentist surgery	University	Restaurants	Exhibition centre	Swimming pool	Prison Detention centre
Health Centre	Nursery Schools	Hotels and Inns	Conference	Health clubs	Community centre
Nursing Homes		Guest Houses		Tourist Attractions	Job centre
Retirement Residential home		Banquet/function		Night Clubs	Housing centre
		Wine Bar		Theatre Concert halls	
		Campsite		Ice rink	
				Cinema	
				Historic building Stately homes	



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