Supporting Information

S1. Water production processes

Information about the production processes of four out of the five analysed bottled water brands (brands 1,2,3, and 5) was obtained from the respective companies. The information acquired included details about the water source, the treatment procedures, and the packaging process.

S1.1 Brand 1

Figure S1 presents the schematic of the water source and treatment process for Brand 1. The primary water source is groundwater extracted from a registered borehole, with tap water occasionally used during shortages. Regardless of the source, both undergo identical treatment steps. Initial disinfection is performed with chlorine (0.8–1 ppm), followed by sand and carbon filtration to remove suspended solids and residual chlorine. A 1 µm polypropylene polishing filter is used to eliminate finer particles, and reverse osmosis via a high-rejection aromatic polyamide membrane removes dissolved solids. Post-treatment chlorination (0.5 ppm) is applied before mineral addition and storage in stainless steel tanks. Before bottling, the water is filtered again, passing through both a carbon filter and a polishing filter, and disinfected with ozone.

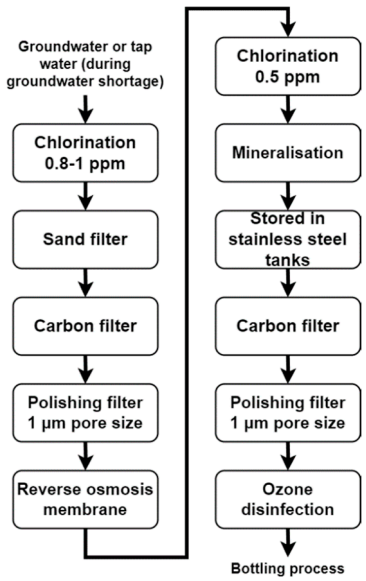

Figure S1 – Water source and treatment process flow diagrams of brand 1.

Figure S2 outlines the packaging process. Bottles are blow-moulded in-house from externally sourced preforms, rinsed with acetic acid and ozonated water, then filled with treated water. Bottle caps, also externally sourced, are rinsed with ozonated water prior to sealing. Bottled water is then labelled and distributed. Specific laboratory testing protocols prior to release were not disclosed.

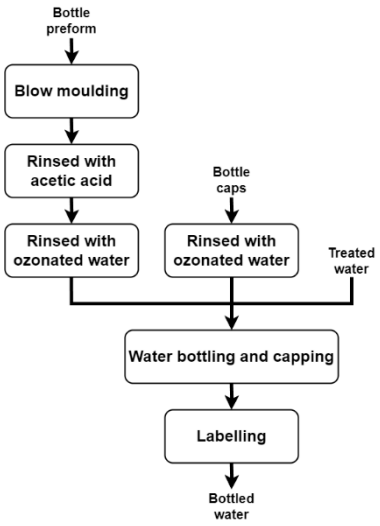

Figure S2 – Packaging process flow diagrams of brand 1.

S1.2 Brand 2

Figure S3 outlines the water source and treatment process for Brand 2. The water is sourced from both groundwater (extracted via borehole) and tap water, mixed in ratios ranging from 50:50 to 60:40. These are blended in a reservoir before entering a two-stage treatment system.

In the first treatment stage, the water undergoes chlorination (1–3 ppm, typically 1.5 ppm), sand and carbon filtration, UV disinfection, 10 µm polypropylene (PP) polishing filtration, and 5 µm PP reverse osmosis filtration. Water from this stage may be used for general applications or proceed to further purification. The second treatment stage involves repeated carbon filtration, UV disinfection, polishing, and reverse osmosis filtration, followed by mineral addition and final ozone disinfection. All treatment processes occur in stainless-steel infrastructure, which is periodically cleaned with caustic powder. Filter performance is actively monitored, and components are replaced when efficiency declines, although no specific thresholds or cleaning frequencies were disclosed.

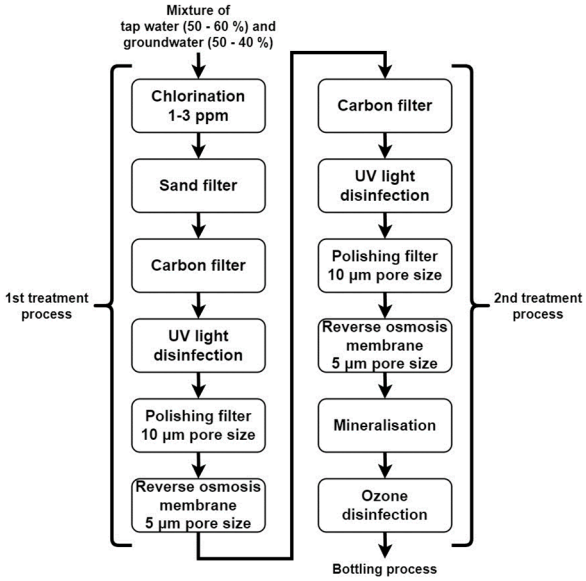

Figure S3 – Water source and treatment process flow diagrams of brand 2.

As shown in Figure S4, the packaging process begins with in-house blow moulding of bottles from externally sourced preforms. Bottles are rinsed with ozonated water and disinfected with UV light. Caps, also externally sourced, are visually inspected and UV disinfected. During filling, clean air circulation replaces 90,000 m^3 of air per hour to minimise contamination risk. Bottles are then capped, labelled, and prepared for distribution.

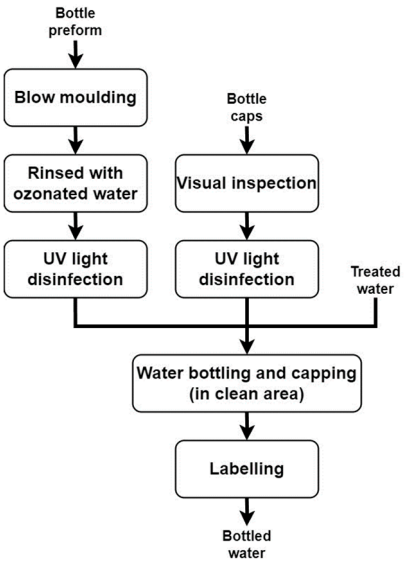

Figure S4 – Packaging process flow diagrams of brand 2.

S1.3 Brand 3

Figure S5 presents the schematic of the water source and treatment process for Brand 3. The sole water source is municipal tap water, which undergoes a two-stage treatment process.

In the first treatment stage, the water is filtered through a carbon filter to remove chlorine and other impurities, improving taste and odour. It is then disinfected using UV light, followed by polishing filtration with a 1 µm polypropylene microfibre filter to eliminate suspended particles. The water is subsequently treated with a high-rejection aromatic polyamide reverse osmosis membrane to remove dissolved solids. The second stage mirrors the first, repeating carbon filtration, UV disinfection, polishing, and reverse osmosis. After treatment, minerals are added to adjust the pH to approximately 7, and final ozone disinfection is applied to ensure microbial safety.

Details about the packaging process, including bottle and cap production or cleaning procedures, were not provided. This limits assessment of potential contamination sources during the bottling stage.

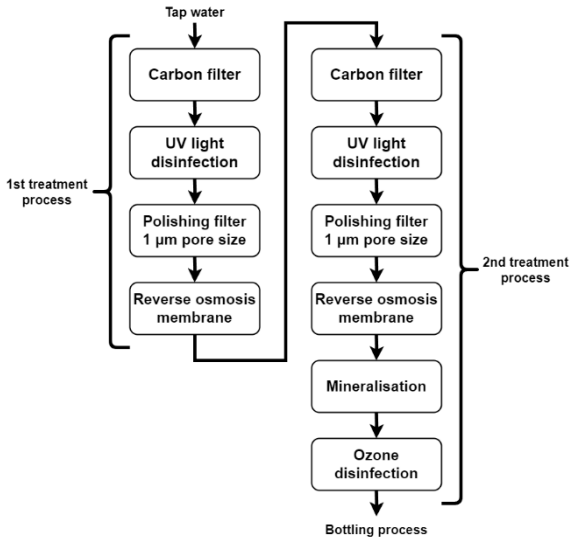

Figure S5 – Water source and treatment process flow diagrams of brand 3.

S1.4 Brand 4

For Brand 4, the company did not disclose essential details regarding the water source, treatment process, or bottling procedures. The only available information is that bottle bodies are not blow moulded in-house. No further details were provided regarding the logistics of

bottle transport, including whether bottles are sealed during transit or cleaned and disinfected prior to filling. The absence of this information limits the ability to assess potential contamination risks, particularly from external sources introduced during handling and packaging.

S1.5 Brand 5

Figure S6 illustrates the water source and treatment process for Brand 5. Water is sourced from a registered borehole and treated in two stages. First, a water softening process is applied to reduce hardness minerals such as calcium, magnesium, and iron. This is followed by treatment with a high-rejection fibreglass reverse osmosis membrane to remove dissolved solids. The treated water is then stored in tanks, and prior to bottling, it undergoes an additional pass through the reverse osmosis membrane.

No details were provided regarding the bottle and cap production, cleaning procedures, or the water filling process, which limits assessment of potential contamination risks. However, it was disclosed that daily microbiological and chemical testing is conducted on water samples, and bottled water is only released for distribution upon confirmation of compliance with quality and safety standards. Specifics of the testing protocols were not shared.

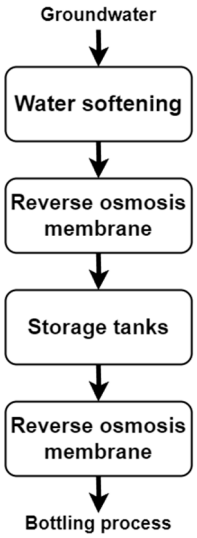

Figure S6 – Water source and treatment process flow diagrams of brand 5.

S2. Galaxy Count modified script

The 'Galaxy Count' software was used for quantification and sizing of the particles. It is built from 4 different codes. Two of them, titled 'galaxyCount' and 'handleCSV' had modification that can be seen below:

S2.1 'galaxyCount' code

The following line was added before the void command (line 32):

```
boolean saveBlobSizes = true;
```

The following was added at the end of the "Calculates and Displays Stats" code block (line 117):

```
  if(saveBlobSizes == true){
    saveSizesCSV(blobSizes);
  }
```

S2.2 'handleCSV' code

At the end of the original code, the following was added:

```
Table blobsTable;

void saveSizesCSV(int[] blobSizes) {

  blobsTable = new Table();

  blobsTable.addColumn("id");
  blobsTable.addColumn("size");

  float originalBlobSize;
```

```
  for (int i = 0; i < N; i++) {

      originalBlobSize = blobSizes[i]*pxScale;
      TableRow blobRow = blobsTable.addRow();
      blobRow.setInt("id", i+1);
      blobRow.setFloat("size", originalBlobSize);
    }

  String csvName = split(imgName, &apos;.&apos;)[0];
  saveTable(blobsTable, "data/sizes/"+ csvName +".csv");
}
```

S3. Microplastics size distribution

The sizes of the microplastics, after accounting for the negative control, were then represented as histograms illustrating the distribution of the particle sizes. These histograms are presented for Brands 1 to 5 in Figure S7 (a-e) respectively. Additionally, the histogram for the negative control samples is provided in Figure S7 (f).

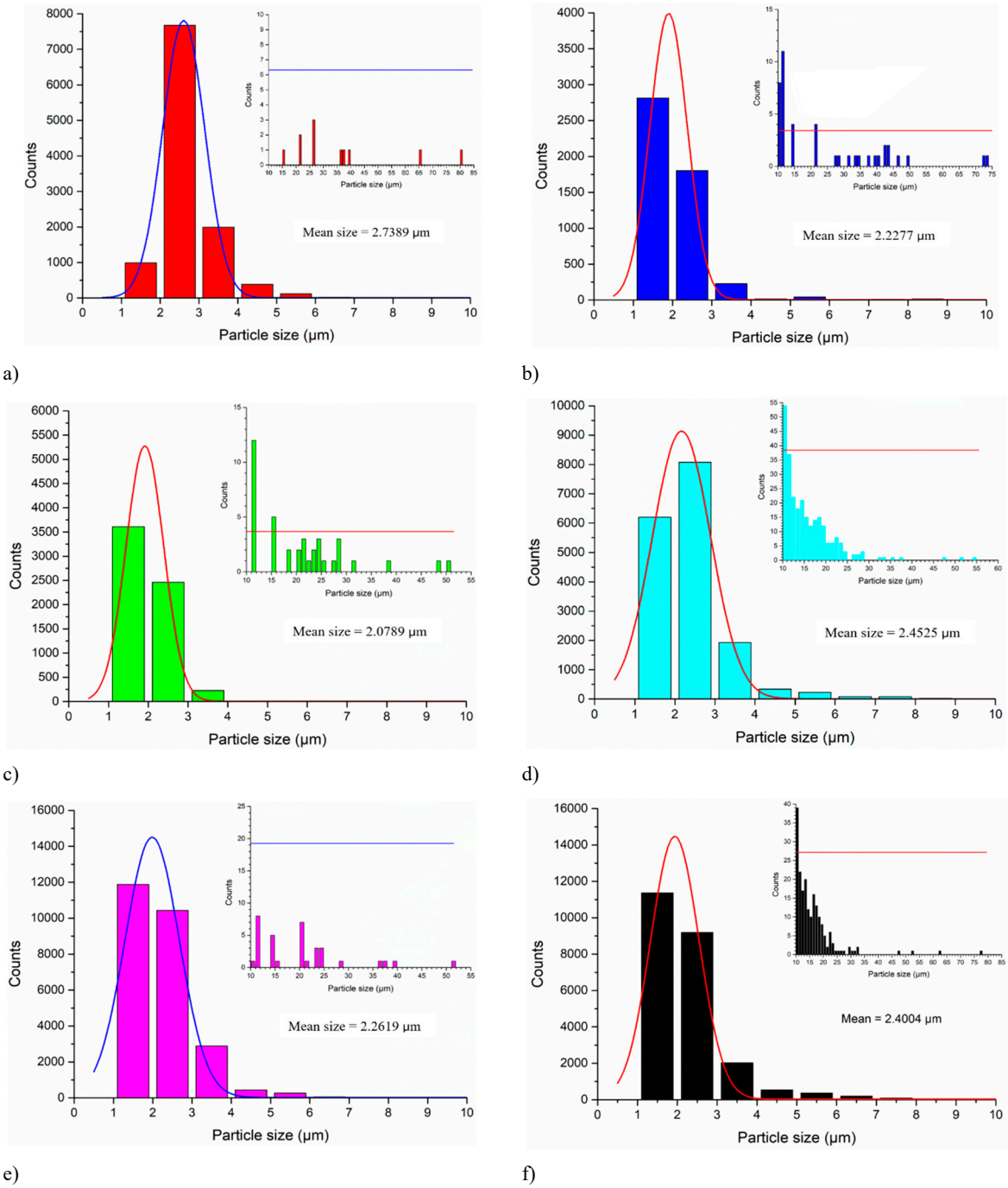

Figure S7 - Histogram of particle sizes detected in samples of (a-e) Brands 1-5 and (f) the negative control, including Gaussian curve in a skewed distribution.

S4. Raman spectrums of bottle packaging

From each brand, samples of the bottle bodies and caps were sectioned and analysed with Raman spectroscopy. A representative Raman spectrum obtained for each of these samples can be seen in Figure S8 (a-e) for Brands 1 to 5 respectively.

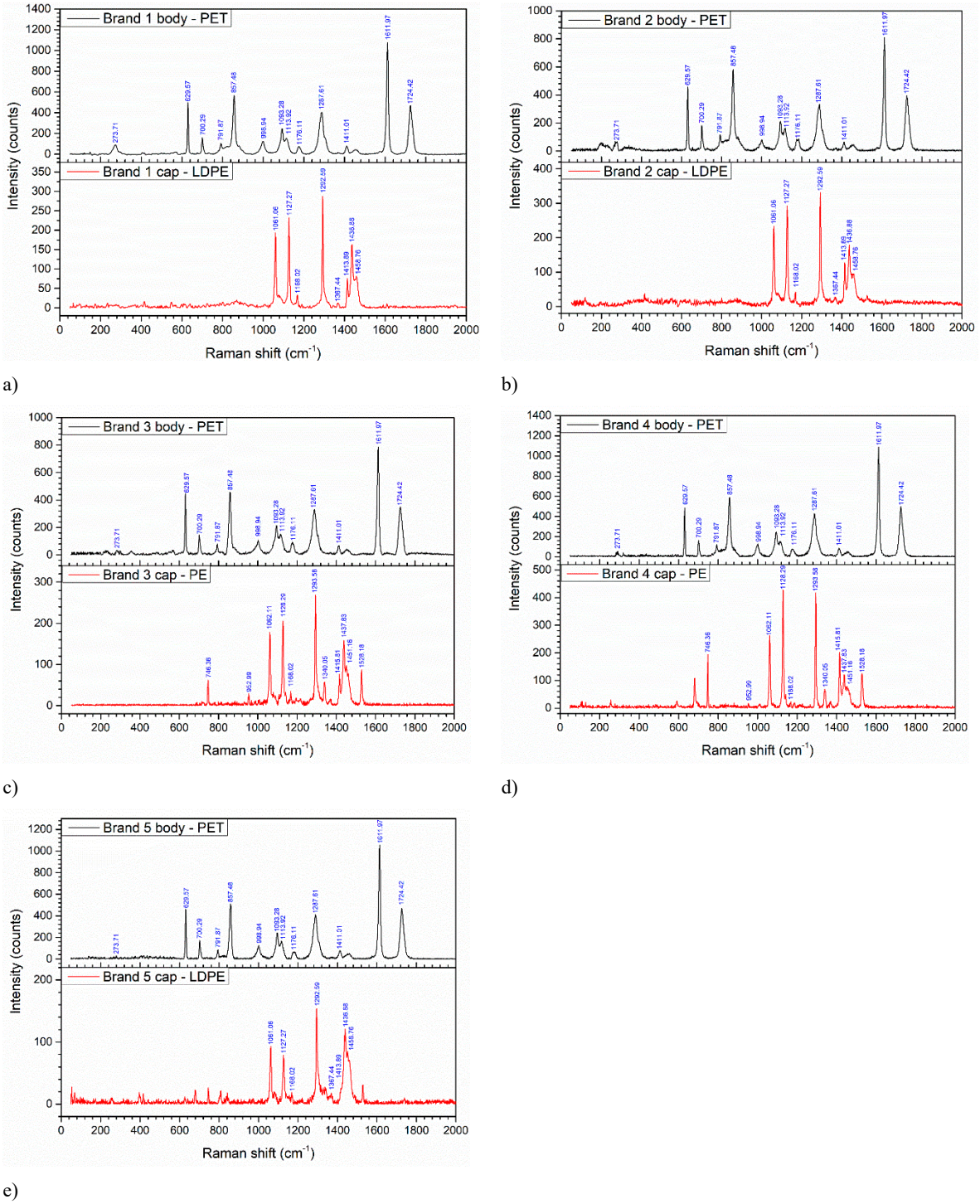

Figure S8 - Raman spectra of the bottle packaging body and cap for (a-e) Brands 1-5.