

# Water Management

Water is a precious resource, both on our ship and off. We go to great lengths to ensure it's used efficiently.

Our water strategy is three-fold:

- 1** Conserve water as much as possible
- 2** Produce most of the freshwater we need onboard
- 3** Safely treat our water discharge

## CONSERVING WATER

We take steps to reduce water consumption using efficient tools like aerators, low-flow showerheads, and reduced-flow dishwashers and laundry equipment. Creative processes are also in play. For example, condensation from air conditioning units is collected and repurposed in our laundry facilities for washing towels and bedsheets.

## PRODUCING FRESHWATER ONBOARD

Royal Caribbean Group ships produce 90% of the freshwater used on board via desalination or reverse osmosis. This water is used for drinking, showers, sinks, toilets, kitchen galleys, pools, technical machinery, and spas aboard our ships.

**We use two main processes to produce our freshwater.**

### Desalination

Our desalination system boils and evaporates seawater, which is then condensed into freshwater. While this process is energy intensive, we account for this by repurposing our engine waste heat or steam from exhaust gas boilers to heat the water.

### Reverse Osmosis

This system creates freshwater by pumping seawater at very high pressure through a filter or semi-permeable membrane that only water molecules can pass through. The newest reverse osmosis systems on our ships require 65% less energy to operate than earlier generations.

**90%** On average, we produce 90% of our freshwater onboard.

**66 GALLONS** The average water consumption of our guests is 66 gallons per day, 34 gallons less than the average U.S. resident.

## WASTEWATER TREATMENT

We aim to have no untreated wastewater on our ships go overboard, which is why we aim to have all our ships are equipped with wastewater treatment plants. These plants take all international and maritime standards and law into account, and in many cases go above and beyond what's mandated. These steps help limit impacts from our operations and protect ocean health and wildlife.

## ADVANCED WASTEWATER PURIFICATION

In 2004, we made a commitment to install Advanced Wastewater Purification (AWP) systems in many of our ships. These tertiary systems treat sewage and graywater—including water from sinks, showers, and kitchen galleys—to standards twice as stringent as U.S. federal standards.

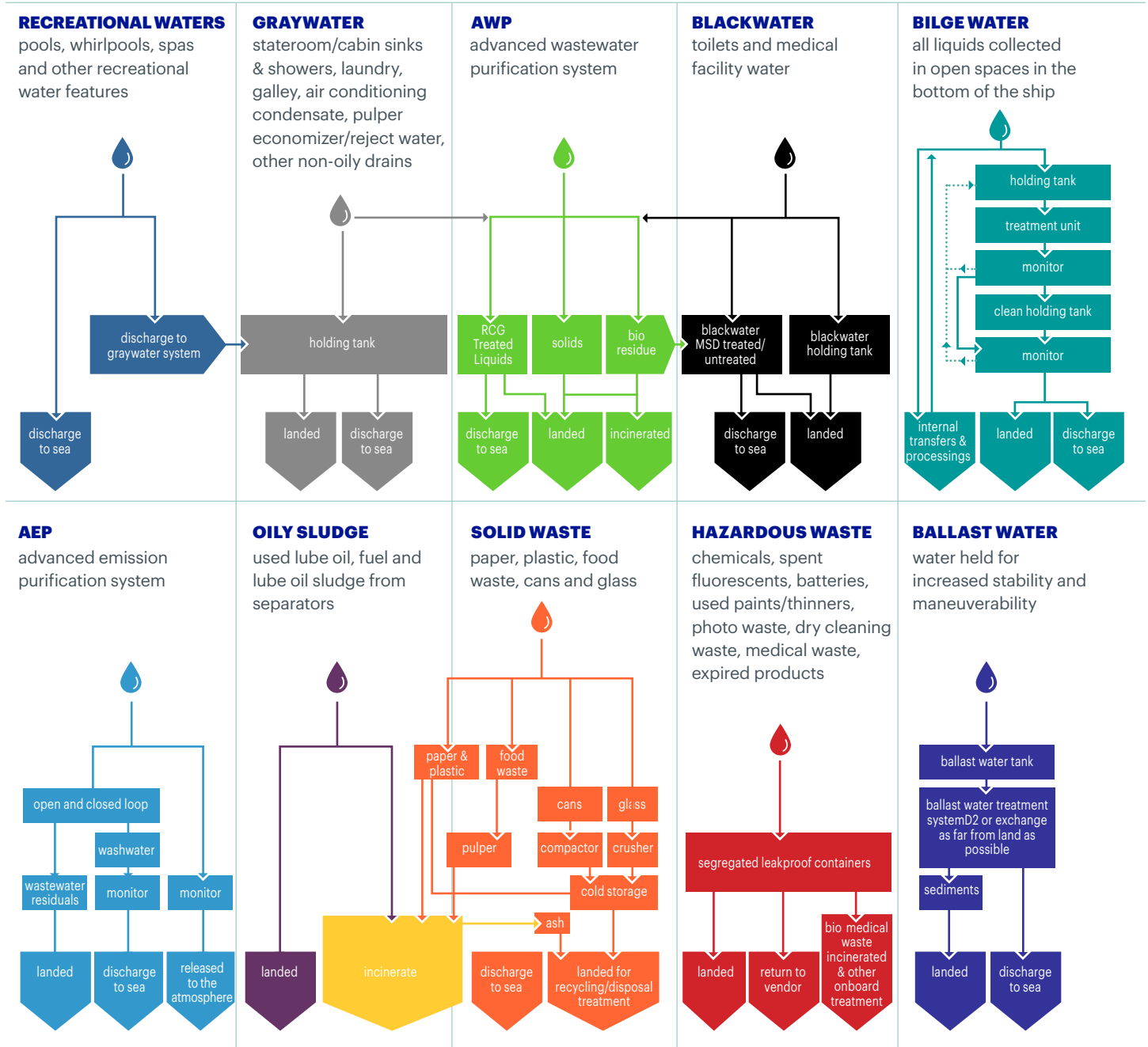
Treated wastewater is discharged no closer than three nautical miles from shore unless specifically permitted to do so in certain areas. All other wastewater and graywater is discharged a minimum of 12 nautical miles from land, compared with the three nautical miles required by applicable laws. AWP systems have been fitted on 88% of our fleet through 2021.

## BALLAST WATER TREATMENT

Ballast water is seawater brought onto a ship to help stabilize it to international standards. Our systems treat ballast water, which reduces or eliminates its potential to discharge non-native species into other environments when the ships move to other ports. Currently, 92% of our fleet is equipped with ballast water treatment systems, as part of our ongoing initiative to include this feature on all our vessels.

**88%** Advanced Water Purification systems have been installed on 88% of our ships.

## Types of Waste:



## Above and Beyond Compliance

Royal Caribbean Group’s water and waste discharge practices exceed most International Maritime Organization (IMO) standards and laws, including the International Convention for the Prevention of Pollution from Ships (MARPOL). Our ethos at Royal Caribbean Group is continuous improvement, which is why most of our policies take us above and beyond what’s mandated.

Water/waste type	MARPOL/IMO policy	Royal Caribbean Group policy
<b>Recreational water</b>	Not regulated	Recreational water must be dechlorinated if discharged beyond 4 nautical miles (NM). If water is chlorinated, it must be discharged at 12 NM at a speed of 6 knots or greater.
<b>Graywater</b>	Not regulated	Graywater must be discharged beyond 12 NM at a speed of 6 knots or greater.
<b>Advanced Wastewater Purification (AWP)</b>	Wastewater must be treated and discharged beyond 3 NM, per flag state standards and subject to local restrictions.	Treated wastewater must be discharged beyond 3 NM at a speed of 6 knots or greater.
<b>Blackwater</b>	Untreated blackwater may be discharged beyond 12 NM or beyond 3 NM if treated (subject to local restrictions).	All blackwater must be treated and must be discharged beyond 12 NM at a speed of 6 knots or greater.
<b>Bilge water</b>	Bilge water must be treated to $\leq 15$ ppm and only discharged while the ship is underway.	Bilge water must be treated to $< 5$ ppm and discharged beyond 12 NM and at a speed of 6 knots or greater.
<b>Advanced Emission Purification (AEP)</b>	AEP wash water may be discharged anywhere provided it meets discharge standards.	AEP wash water must meet MARPOL Annex VI standards and may only be discharged beyond 3 NM and while underway.
<b>Solid waste</b>	Waste incinerated onboard must be handled in an approved incinerator (exempt if installed prior to Jan. 1, 2000).	Waste must be incinerated in an approved incinerator outside of all ports, harbors, or estuaries.
<b>Landed waste</b>	Waste must be “landed” to locally approved and licensed waste vendors.	“Landed” waste must be sent to a licensed waste contractor and/or processing/disposal facility that meets Royal Caribbean Group’s vendor approval standards.
<b>Food waste</b>	Food waste must be pulverized/comminuted to $< 25$ mm before being discharged at $> 3$ NM, or $> 12$ NM if in a special area.	Food waste must be pulverized/comminuted to $< 25$ mm before being discharged at $> 12$ NM and at a speed of 6 knots or greater.
<b>Ballast water</b>	The Ballast Water Convention requires that ballast water be discharged overboard only if treated through a ballast water treatment system in accordance with IMO guidelines or exchanged mid-ocean.	In addition to meeting Ballast Water Convention guidelines, Royal Caribbean Group further requires ballast water to be treated by a U.S. Coast Guard-approved ballast treatment system or exchanged as far from land as possible, then discharged beyond 12 NM or as per local restrictions.