

INTRODUCTION

This technical brief is intended to provide guidance for UNHCR Staff and Partners involved in winterization of WASH facilities in the current European refugee and migrant situation.

Winterisation of WASH facilities is required in cold regions where the average temperature falls below 0°C for one week or more each year. In these conditions it is important to predict the factors that could affect WASH service provision during the winter period and to determine what can be done to overcome the difficulties.

The following questions are helpful to plan WASH interventions in cold regions:

- Are WASH systems at risk of damage from freezing, and what is required to protect those systems? To what depth will the ground freeze?
- How will the cold affect the maintenance/operation of WASH facilities (e.g. winter access for desludging trucks)?
- Will cold weather change sanitation and hygiene practices in the winter (e.g. toilets are too cold or too far away from accommodation and people will not use them; washing water / showers need heating)?

WATER SUPPLY WINTERIZATION REQUIREMENTS

The following prioritized factors should be considered for winterization of water supply systems:

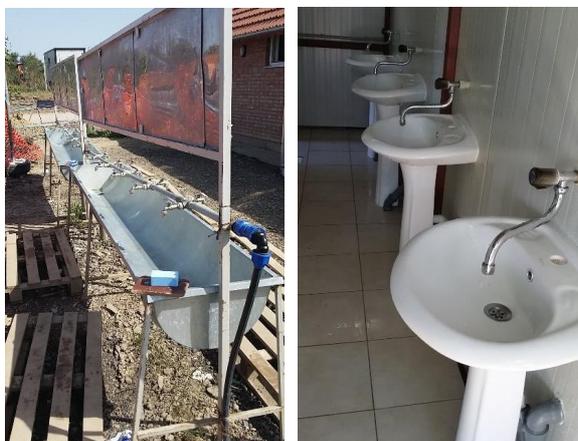
1. Ensure water supply systems, including pipelines, pumps, tanks and reservoirs are protected from freezing. This may require construction of adequate structures to protect water system components (eg. Pump stations and water points), insulation of pipelines and tanks, and burying pipes below the depth of ground freeze.
2. Ensure water treatment process operations take into account slower rates of chemical reactions (eg. Chlorine) and the higher viscosity of water at lower temperatures.



Picture showing insulation of water supply pipes outdoor and the damage freeze could cause to un-insulated pipes.

WATER SUPPLY WINTERIZATION TECHNICAL GUIDANCE

- When distribution networks freeze: ice forming in pipes and valves is liable to damage them. Solutions include burying pipes at depths greater than the maximum depth of frost penetration, insulation of pipes, maintaining a continuous flow, and building 'valve-boxes' lined with insulating foam to help preventing frost damage.
- Water points need to be housed indoor in adequate structures to protect them from freezing, and to adequately shelter people from the elements as they are queuing to collect water. Ideally drinking water collection points (water bottle refilling stations) will be separated from toilets blocks to avoid potential for contamination of drinking water containers.
- Traditional humanitarian equipment is not always suitable for use in colder countries. For example 'Oxfam' water storage tanks, have had problems with both water freezing and roof collapse under a snow load. 'Onion' or 'bladder' tanks are especially unsuitable if there is any risk of water freezing inside them. Problems have been overcome by locating tanks inside heated buildings, insulating tanks, or ensuring continuous flow into the tank to avoid freezing.
- Chemical processes are slower in cold water, an example being the reaction when water is chlorinated. Chlorine quantity and contact time required should be tested at the correct temperature.



Pictures from outdoor (likely to freeze) and indoor water points (adequately located in winter)

SANITATION and HYGIENE – WINTERIZATION REQUIREMENTS

The following prioritized factors should be considered for winterization of sanitation facilities:

1. Ensure winter access routes are maintained for latrine/septic tank desludging vehicles.
2. Ensure sanitation and hygiene facilities are protected with adequate structures (toilets, showers, washing basins, laundry facilities), and hot water is provided for shower and laundry facilities.
3. Ensure wastewater systems, including pipelines, pump stations, septic tanks and reservoirs are protected from freezing. This may require construction of adequate structures to protect wastewater system components (eg. Pump stations and water points), insulation of pipelines and tanks, and burying pipes below the permafrost level.
4. Ensure adequate drainage for surface rainwater / snow melt water from sites.

SANITATION WINTERIZATION TECHNICAL GUIDANCE

- Desludging trucks accessibility might be impossible during winter. In such cases, plan for onsite alternatives.
- Structures housing WASH facilities must be designed to support snow loading.
- Where possible stockpile quantities of fuel before winter arrives and equip water heaters with hybrid solar powered systems.
- In septic tanks the rate of sludge accumulation is very high at low temperatures, when the rate of bacterial reaction processes is considerably reduced. Regular desludging is an absolute necessity in cold regions, with sludge being taken either to a wastewater treatment facility or to a designated disposal site.
- Insulation of wastewater pipes/pumping stations follows the same procedures as per water supply pipes and pumping facilities.
- Stagnating flood or snow melt water should be evacuated via drainage ditches dug in advance.

HYGIENE WINTERIZATION TECHNICAL GUIDANCE

- People will wash more often if hot water is available; and washing clothes in hot water is an effective way to kill the eggs of lice. The provision of hot water facilities for washing, will make a positive contribution to the overall health of refugees in cold areas.
- Snow should not be eaten, as it lowers the body temperature, and may cause hypothermia. Snow must be melted and treated appropriately before drinking.

References

- Out in the Cold – Emergency Water Supply and Sanitation for Cold Regions. Mark Buttle and Michael Smith. WEDC, Loughborough University. 2004. (http://wedc.lboro.ac.uk/resources/books/Out_in_the_Cold_-_Complete.pdf)



Pictures showing solar and boiler heating systems for showers.