

DÉNES KÁLMÁN

ASPECTS OF WATER SUPPLY AND SEWAGE SYSTEMS IN MILITARY CAMPS

KATONAI TÁBOROK VÍZELLÁTÁSÁNAK ÉS CSATORNÁZÁSÁNAK KÉRDÉSEI

Az ivóvízzel való takarékoskodás fontos feladat a Földön, mert a népesség és a vízigények növekedése mellett a vízkészletek egyre korlátozottabban állnak rendelkezésre. Dolgozatomban azokkal a lehetőségekkel és megoldásokkal foglalkozom, amelyek a vízellátást és a csatornázást biztosítják katonai táborokban.

Owing to challenges represented by a quickly growing population and aqua stocks continually decreasing, economizing on drinking water has become an important worldwide task. My essay is meant to highlight the possibilities and solutions that may enable military camps to water supply and canalisation.

Introduction

Due to the changes in safety during last decade as well as the new challenges and risks of our days, requirements and expectations regarding to the Hungarian Defense Forces have changed considerably. While the possibility of warlike conflicts is decreasing, disasters relief, anti-terrorism as well as allied peacemaking and peacekeeping military tasks gain priority. Hungarian Defense Forces carry out these military tasks not only from permanent barracks, but temporary or permanent military camps are used as headquarters.

A *military camp* is a semi-permanent special facility established in the field, together with the necessary infrastructure, and designated to accommodate military personnel for short or longer period of time, and ensure their necessities.

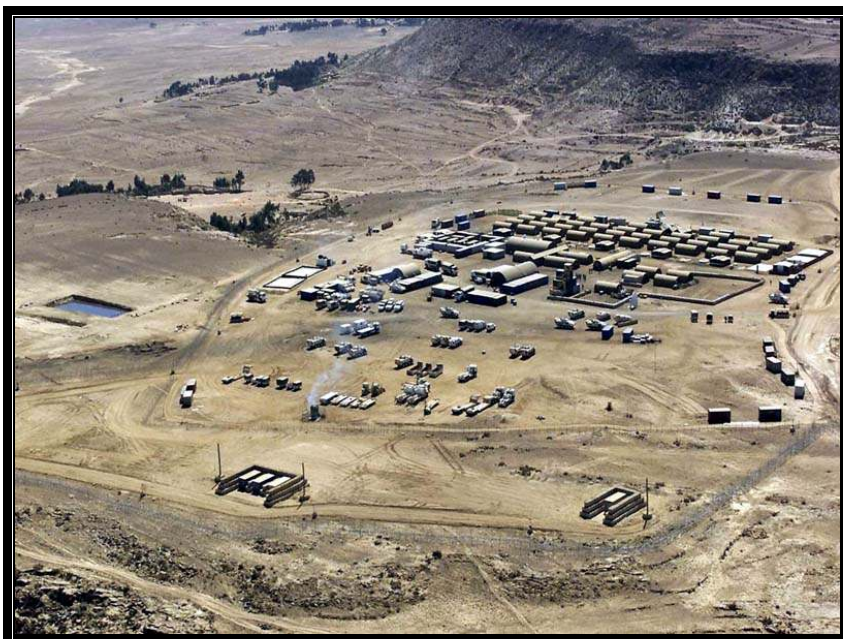


Figure 1: Military camp¹

Water supply

Supply, especially water supply and shape of healthy environment are the most important in order to accommodate military forces and keep their fighting efficiency. For successful accomplishment of military tasks and efficiency of personnel we have to produce the potable water, water for domestic purposes in necessary quantity and quality, and also have to deal with the sewage water and environmental protection. Contaminated water is one of the most devastated weapon, the whole personnel can make unfit for fighting for a short or a longer period of time.

Location of application (homeland, foreign areas) and forms (armed combat, terrorism hazard) of the armed forces significantly determines the characteristics, supply and safety of military camps and importance of environmental protection tasks.

¹ Source: http://www.hm.gov.hu/popup.php?img_url=/files/9/9990/tabor_n.jpg (2011. 02. 12)

In peacetime, in case of accommodation in barracks, particularly national laws and regulations are authoritative for water supply, process of sewage systems and environmental protection.

Table 1. illustrates the connections between the basic tasks of the Hungarian Defense Forces and the characteristics and location of military camps.

Military tasks		Military camp CONSTRUCTION				
		Hungarian territory		Abroad		
period of execution	goal, characteristics	Temporary For a short time	Permanent For a long time	Temporary For a short time	Permanent For a long time	
Wartime (activity of war)	War activities. (without tasks of accommodation)	-	-	-	-	
	Support of combat activities. (special object, storing, concentration areas.)	X	-	X	-	
	Prepare for combat. (resting of withdrawn troops, trainings)	X	X	X	-	
	Military operations under the order of North Atlantic Treaty paragraph 5.	In Hungary	X	X	-	-
		Abroad	-	-	X	-
Peacetime Allied and general military tasks	Training, exercises	X	-	X	-	
	Military tasks, defensive tasks (disaster relief, anti-terrorism, construction, storing)	X	X	X	-	
	Mission and peace support tasks (independent accommodation and supply)	-	-	X	-	
	Mission and peace support tasks (multinational accommodation and supply system)	-	-	X	X	

Table 1.

In case of war, the successful completion of mission is the main consideration, therefore everything is subordinated to this. In compliance with it, regulations of national or international laws, orders NATO STANAGs do not have so strict requirements concerning for hygienic, infrastructure development, process of sewage water and environmental protection, as well as for water quality.

Such unified NATO specification is e.g. STANAG 2885 that determines emergency water supply of NATO forces in wartime. This document declares that essentially the civilian water pipes can be used for water supply of NATO forces in wartime until its breakdown. Nation ratified this STANAG can use emergency measures only after this breakdown, based on regulations of STANAG 2136. STANAG also determines minimal daily quantity of water per head, and it deals with water requirement of medical and logistic troops. (Table No. 2)

Serial	Use	Requirement (litres/individual/day) Under Normal Conditions
1.	Unit in actions: Drinking and cooking only (individual soldiers)	25
	General consumption	70
2.	Medical Troops: Battalion Aid Station	50 + 70
	Clearing Station (Brigade- Corps Level)	170
	Evacuation Hospital	200 + 70
3.	Temporary or Semi- Permanent Camps: Drinking, cooking and laun- dries	100
	As above, plus domestic water	150

Table 2.

NATO STANAG 2136 determines the minimal requirements against potable water supplied in the theatre of war, and frequency of examinations on water quality during the course of technological process. These regulations are limiting values of water quality, and defer from the civil rules in the field of frequency of control.

During peace support operations lawfulness and respect of regulations are exactly as important as the successful completion of the mission. (Armed fight might be an exception.) Development, supply of military camps built for this reason and execution of environmental protection tasks essentially based on national civilian and military laws, standards, technical directives and accepted NATO STANAGs. These regulations, rules and norms concerning the water quality and quantity have to respect during execution of tasks.

Ones of the most important national laws are 201/2001. (X. 25.) and 47/2005. (III. 11.) Governmental regulations, that declares quality requirements of potable water and the order of water quality control.

Respect of regulations of national laws and military directives is always mandatory when supply of our own troops (including water supply, too) is realized by the supply system of the Hungarian Defense Forces. If we develop a military camp for accommodation of NATO troops and their supply, or we pay for a service of a NATO camp, the application of NATO STANAGs is mandatory.

During accommodation in a camp, the national and NATO rules mentioned afore influence the tasks of supply and their accomplishment. Difference between permanent or temporary military camps can base on their expectable employments that have an influence on their structure and accomplishment of the supply system.

We use mobile, easily installable equipment for supply of military camps in the event of temporary application. Hungarian Defense Forces brought into service ZENON mobile water purification equipment for supply of water demands. It can produce 5m³ potable water during normal conditions.

Permanent solutions, systems and equipment are used for supply of military camps in the event of permanent application. The water supply and sewage system, if it is possible, should be in connection with the civilian pipe networks.

Although the safe handling of sewage and the protection of the environment are considered as of equal importance, even at present it is common practice in the Hungarian defence forces to deem them to be independent of each other. My research aims to handle the two sides of the issue as inseparable.



Figure 2: ZENON Mobile Potable Water Treatment System²

Most of the sewage water in military camps is produced by human metabolism. Apart from an average of 2-3 litres/person/day (mostly urine and faeces), it tends to contain 50 times as much liquid waste like washing, flush and bath water — all these considerably diluting it. It results in sewage water of various kinds and compound appearing mixed at a sewage farm. Consequently, the technology is to be adjusted so that even sewage water of rather mixed origin can be cleaned in compliance with official standards —this is the approach commonly regarded as up-to-date these days - mainly for financial, economical and technical reasons. The reasons for as well as the benefits of collecting and cleaning sewage water are as follows.

Unfortunately, recycling sewage water is still not common practice either in civilian or military water management, which is due to the fact

² Source: BABINECZ János ret. eng. colonel

that Hungary is known to be rich in high quality water. However, as a result of the current global population boom and the diminishing water supplies/resources, economizing on drinking water is equally urgent and crucial. Not only is the number and capacity of water resources decreasing — unfortunately, urbanization along with the current economic tendencies is deteriorating into worse and worse water quality. Although Hungary is not deeply affected by that at the moment, preventive steps are to be taken in order to prevent the process from becoming irreversible. The protection of our water resources has to involve economizing on potable water as well as purifying and recycling sewage water.

Regarding military tasks, economizing on potable water and recycling sewage water gain momentum if

- there is no opportunity to join any public water facilities;
- in lack of sufficient water from public facilities, an independent way of obtaining and purifying water is needed;
- for safety reasons, no public facility is to be used in wartime, which means that self water supplies are a must;
- there is no access to a sufficient amount of water;
- no water purifier of reasonable capacity is available.

In case of a definite need of economizing on water for technical, economical or military security reasons, technologies involving:

- collecting and using rainwater (and purifying it, if need be);
- clarifying and recycling certain kinds of sewage water;
- applying up-to-date and economical equipment, and
- changing consumption habits are strongly required.

It is obviously rather a complex task, which is likely to trigger considerable changes in the current ways of ensuring water supplies in military camps. In compliance with the relevant national law and NATO STANAG,

- potable water (mostly it means bottled mineral water in foreign countries);
- potable water for cooking, bathing, washing, washing up, e. t. c. purposes;
- utility water;
- technological water is to be provided.

On certain occasions, rainwater or purified sewage water can economically and safely substitute potable water. Independently of the

amount of pollution in raw water, the currently used water purification technologies are suitable for producing potable water. However, they are rather costly. Security is a basic requirement — all the quality-related requirements made by the relevant regulations have to be satisfied - independently of quality and availability. In other words, under no circumstances is bad water quality allowed to endanger personnel health and the success of completing military tasks. According to Decree 201/2001 (X.25.) water suitable for drinking, cooking, making food or being used in the process of making food qualifies as drinking water, independently of its origin or whether it is obtained from water pipes or containers. Based on this, what is to be identified is all the fields where a considerable amount of water (not necessarily drinking water) can be provided.

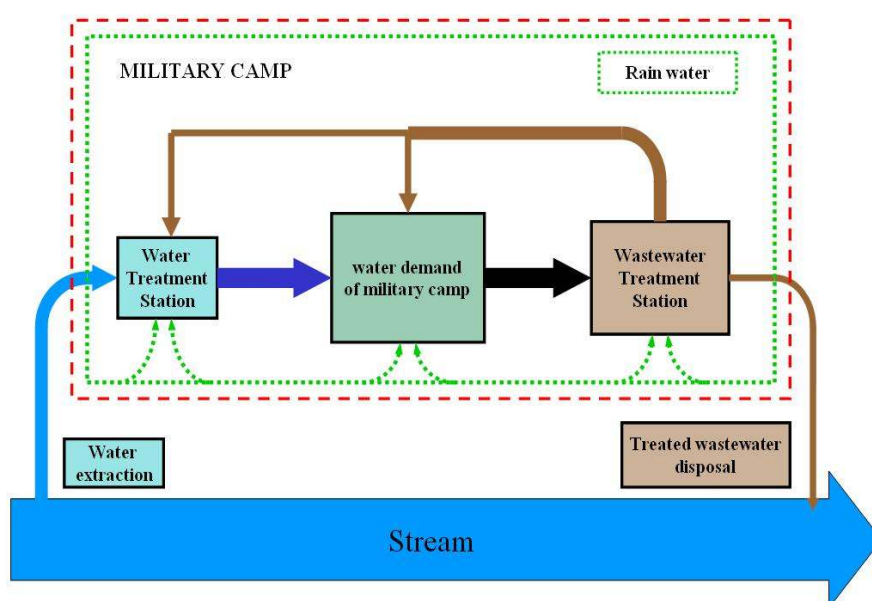


Figure 3: Water utilities in a military camp (version)³

Regarding all that, in my opinion purified sewage water can be used

- as utility water (flush water in toilets);
- technological water (e.g. for cleaning vehicles);

³ Source: The author

- maintenance water (when watering greenery or cleaning streets and/or parking places), and
- extinguishing water.

Although the list above is rather short, regarding the fact that, for example, flushing needs 30-60 litres/person/day, cleaning a car requires about 200-300 litres while 1 m of greenery may need 1.5-3 m of water, they represent considerable water consumption. The main point is that none of them require drinking water. Using rainwater and recycling sewage water mean that, besides a rainwater collecting system, a minimum of two water supply networks and two sewage water networks are necessary. Apart from all that, several sewage farms have to be built and run so that the required water quality can be provided. These solutions obviously mean extra costs. However, in case of several military camps and military tasks, the security of the personnel and a successful completion of military tasks take priority over costs.

Summary

To summarize the statements above we can declare, that due to the changes of tasks of the Hungarian Defense Forces, several national and NATO requirements have to be respected during development of military camps, concerning the water supply, sewage system and environmental protection tasks. The goal of the current transformation is that the Hungarian Defense Forces should be capable to fulfil requirements mentioned above; even if the basis of an execution is a temporary or permanent military camp. Taking health, security and task-related issues into consideration, it is advisable to create independent water supplies. In order to achieve this aim, recycling sewage water with the best possible purification technology is inevitable.

Felhasznált irodalom

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