

# Watershed Report: A Year in Moria Camp

November 2017 - November 2018



# Watershed in Moria

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The Greek islands in the Aegean Sea are still overwhelmed by the ongoing European refugee crisis. Although the signing of the EU-Turkey Agreement in 2015 slowed the numbers of mass arrivals that had previously been seen in the region, it also made it much more difficult for refugees to move from their first point of arrival and progress to the mainland, trapping many on the islands for extended periods of time.

Lesvos, the largest of the North Aegean Islands, continues to have a high refugee population. Over the course of this year, 351 boats have arrived on the shores of Lesvos, carrying 14215 men, women and children. The Greek authorities have transferred a total of 14327 people the mainland this year, with most of the transfers occurring over the past three months. Currently, the refugee population sits at 7573 across the whole of the island, the majority of whom live in Moria First Reception Centre and its adjacent overspill area (known as the “Olive Grove”). Most people are stranded here until either their asylum applications are rejected (and they are eventually deported from Europe), or they reach a stage where they can move on to mainland Greece.<sup>1</sup>

Despite the fact that recently the Greek authorities have been making an effort to transfer a large number of people to camps and accommodations on the mainland, the existing administrative backlog in asylum cases, means that most of the residents who are able to go, have

already been living in Moria for months, and in some cases years.

The Watershed Foundation is a team of dedicated, passionate engineers and builders. We all have one belief in common – that no human being should be living in the conditions we have witnessed in Europe over the last few years.

Currently, our focus is on making the living conditions more bearable in Moria camp and, therefore, providing some level of dignity for vulnerable, displaced people. Clean and working sanitation facilities are absolutely vital for people’s hygiene, physical health and mental well-being. Upon our arrival in November 2017, many of the WASH (water, sanitation and hygiene) facilities such as toilets, sinks and showers were left in unusable conditions, due to a combination of overuse, poor design and a lack of general maintenance.

Wherever we work, we aim to achieve acceptable WASH conditions, based on internationally recognised standards drawn up by the World Health Organisation (WHO) and the Sphere Handbook, which incorporates a ratio between the number of facilities and the population size of the camp. Upon our arrival in November 2017 the population of Moria was around 7500 people, which has now reduced to just under 5000.



During our time here, we have witnessed the population of the camp peak and plummet. In February 2018, the number of residents dropped to 4500, however by April there were over 6500 people. By July, this number rose by a thousand to over 7500 and came close to reaching 9000 during the summer months, when the warm weather calms the waves of the Aegean Sea, and makes crossing from Turkey relatively safer and easier.<sup>2</sup>

All of these figures significantly exceed the official maximum capacity of Moria camp, a former military base which should only house up to 3000 refugees. The strain that this overpopulation puts on the WASH facilities and the general infrastructure of the camp has been the overarching challenge which our team aims to respond to.

We are passionate about the work that we do, and we consider ourselves extremely fortunate to be in a position to enter Moria and implement projects that have a direct, positive impact to improve sanitation, hygiene and living conditions. We want to take this opportunity to thank everyone who continues to support us. Your help has been vital to everything we have achieved so far, we could not do any of this without your support. Thank you for your faith in Watershed and for your compassion towards our friends in Moria.

The following pages provide a summary of the work we have completed over our first year in Moria, from November 2017 to November 2018.

<sup>1</sup>Data in this paragraph from Aegean Boat Report in December 2018

<sup>2</sup>Data in this paragraph from Aegean Boat Report, UNHCR and Hellenic Ministry of Migration



# Toilets

## Container conversions and upgrades

The conversions and improvements that we have made to the toilet facilities are arguably the most impactful projects that we have undertaken.

Upon our arrival to Moria in November 2017, we identified a severe shortage of toilet facilities for the number of residents living in the camp, with some facilities being completely inaccessible to the residents. Furthermore, all of the communal toilet facilities in the open area of the camp were in an abysmal state: unclean, unmaintained, and dangerously unhygienic. Once we had conducted a large-scale project to deep-clean and repair the facilities, we could identify which were most in need of refurbishment. Several had leaking floors, rotten wall panels and completely broken fixtures.

We repaired, replumbed and connected four permanent buildings to the main water supply, which allowed us to reopen the WASH facilities inside, as all of them had been out of order for some time. We facilitated the installation of a total of five toilet containers with our partners at Médecins Sans Frontières (MSF), within the ‘Olive Grove,’ providing facilities for residents of Moria’s overflow area, who previously only had access to a handful of ‘portaloos.’

We have completely refurbished six containers which had the most severe problems. We dismantled the units, stripping them down to the bare structure and essentially rebuilding the

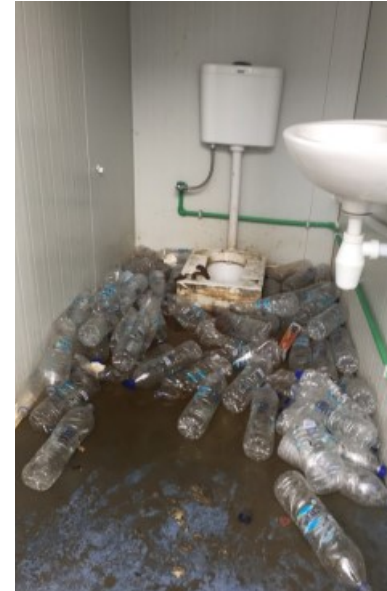
containers, not just improving the quality, but in most cases also increasing the quantity of facilities in each unit.

Having gathered an understanding of how the facilities are used by the residents, we have been able to design multifunctional, needs-based solutions; we usually build up to six wet rooms in each unit, each containing a shower, a sink, a squat toilet and a bidet sprayer.

We have also made upgrades to four more containers, which were in a better but still unacceptable state, by installing water-tight, aluminium chequerplate floors and replumbing the facilities in each cubicle.

### Summary

New Containers	5
Converted Containers	6
Re-opened Toilet Buildings	4
"Upgraded" Containers	4
Additional Toilets (either newly installed or refurbished to a usable state)	84
Additional Sinks (either newly installed or refurbished to a usable state)	109



First impressions of Moria’s toilets



Refurbishing a toilet container after completely gutting the interior of the previously unusable facility



A newly-refurbished WASH container in the “African Section”



Our standard cubicle design incorporates a toilet, bidet hose, sink and shower

# 🏠 Showers

## Adding showers and providing hot water

Ensuring that the residents of Moria have access to decent showers and hot water is equally important to us. Over the course of the year, we have conducted projects across all areas of the camp to add new facilities, ensure that the existing showers are working and to increase the availability of hot water.

We facilitated the installation of two shower containers, adding 12 showers in the ‘Olive Grove,’ in collaboration with MSF. Furthermore, our WASH container conversions increased the number of showers across the camp by 31, as we also install a shower in each cubicle. By converting two previously inaccessible WC rooms into shower rooms, we added six hot water showers to ‘Level 4.’

Despite causing a less significant problem during the hot summer months, ensuring the provision of hot water is a priority for the winter. By servicing and refilling solar panels, and servicing and replacing heating elements in boilers, all of which were no longer functioning sufficiently, we ensured that hot water is available for residents living in the ‘Sections’ (areas reserved for vulnerable residents), the ‘Levels’, and the open areas of the camp.

In April, we laid new water supply lines to increase the water pressure in the main shower block, which greatly increased its capacity, meaning that all 26 showers in the block could be in use simultaneously.

In the Autumn of 2018, we installed an industrial-scale water heater, along with three large hot water tanks, in a new structure we had built alongside the shower block. This system is fueled by olive pellets, a cheap and locally abundant agricultural by-product, and it provides reliable hot water to the 26 showers here for eight hours a day. The custom-built boiler has an output of 200 kilowatts, which is not only much more powerful compared to a standard four kilowatt solar boiler, but also a much more cost-effective and efficient way of heating water, irrespective of the weather.

### Summary

New Containers	2
Converted Containers	6
Additional Showers (either newly installed or refurbished to a usable state)	52
Serviced Boiler Units / Replaced Heating Elements	66
Repaired / Serviced Solar Panels	21
New Solar Boilers	5
New Pellet Boiler	1



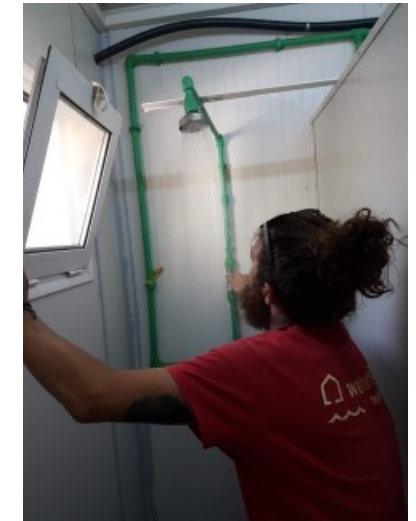
Building a structure to house the boiler which heats water in the shower block



Installing a new solar boiler unit



Insulating hot water pipes



A new shower cubicle in Level Four



# 🏠 Drainage

## 'Wash pads' and Surface Water Management

One of the biggest challenges we face is managing surface water, with many areas around the camp becoming waterlogged due to; rain water, inadequate drainage systems or residents performing household chores such as laundry or washing dishes, without the proper infrastructure in place. Standing water presents unsanitary conditions and can be a breeding ground for diseases and parasites.

In order to overcome these problems, we have installed 68 metres of 'French drains,' trenches containing a perforated pipe, wrapped with webbing and covered with gravel, so the water seeps through the gravel, into the pipe and is drained away properly. These have been implemented in the most saturated areas around the camp. Furthermore, we have dispersed over 120 tonnes of gravel, which covers a surface area of over 600 m<sup>2</sup>, in order to remedy rain-soaked ground, cover sewage leaks and ensure a more hygienic environment. We also installed various storm drains and gullies, which prevents the ground from becoming waterlogged, as rain water is directed away.

Finally, we designed communal spaces that cater to the domestic needs of the residents, known as 'wash pads.' These concrete slabs are gently sloped towards a central drain, so that any water hitting the ground is directed away, rather than flooding the surrounding area. They are fitted with sinks and taps for collecting water, personal hygiene, ritual washing, laundry

and pot washing. Furthermore, they are an multi-purpose solution to simultaneously manage surface water and increase the water points in the camp. Over the year, we have installed a total of 11 wash pads around Moria camp, thereby adding 60 taps and 14 sinks.

### Summary

Ditches (m)	100
French Drains (m)	68
Gullies / Storm Water drains (m)	25
Gravel (tonnes)	120
Approx. Area Covered (m <sup>2</sup> )	600
Ground Water Cleared (m <sup>2</sup> )	60
Wash pads Installed	11
Additional Taps	60
Additional Sinks	14
Additional Outdoor Showers	5
Concrete (tonnes)	77



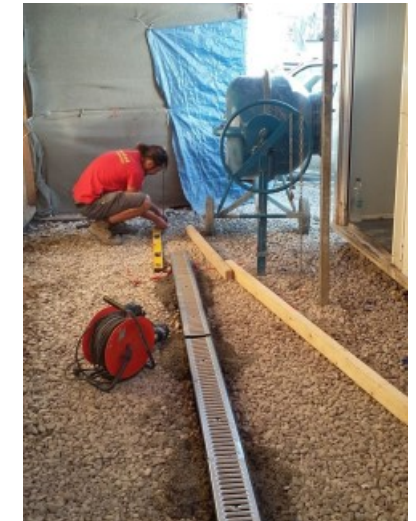
Shovelling gravel to build a French drain



Pouring concrete for a new wash pad



Adding showers to the camp's largest wash pad



Checking the slope on a drainage gully



# 🏠 Sewage system

## Pipe repairs, blockages and floods

Upon our first assessment of the WASH facilities and sewage system of Moria camp, we identified that the existing system was, and remains, undersized for the number of residents who use it each day. In November 2017, all of the sewage pumps were out of order and many pipes were broken or blocked. As these are needed to pump the sewage from Moria camp to the municipal system, this was causing huge sewage leaks across the camp, especially at the entrance.

In order to overcome the limitations of the sewage system, the camp management had to cut the water supply for long periods of time, meaning toilets could not be flushed for several hours during the evening and night. This, coupled with poor waste disposal practices, such as flushing sanitary towels, nappies and bottles, has caused issues, such as blockages, that we have worked continuously to resolve.

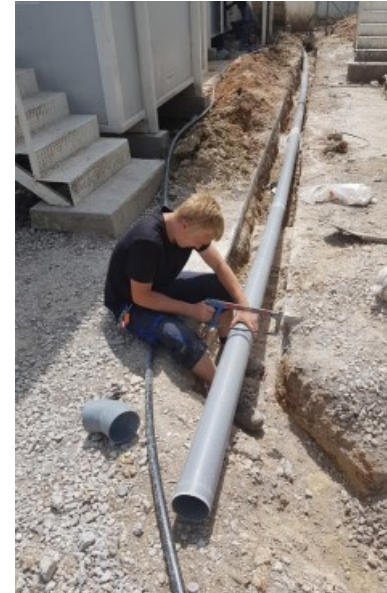
Over the course of the year, we have repaired and reinstalled five sewage pumps, and have unblocked or repaired countless pipes, in order to ensure the system is operating as effectively as possible, which unfortunately still isn't a sufficient capacity and trucks are required to take sewage away every single day. Overall, we have installed over 350 metres of new water supply pipes and over 275 metres of sewage pipes. This has been during a number of different projects in the common area of the camp. For example, we replaced pipes in areas that

they were severely damaged. Some pipes were installed in order to connect a container that had been placed, but left disconnected from the sewage system and main water supply. Furthermore, we installed new pipes during some container conversions and installations, as to properly connect them to the system.

In one month, it is still not uncommon for us to respond to a dozen sewage blockages, which often result in raw sewage flooding common or residential areas.

### Summary

Installed Water Supply Pipes (m)	350
Installed Sewage Pipes (m)	275
Repaired Sewage Pumps	5
Repaired or Unblocked Sewage Pipes	>200
Major Sewage Leaks Repaired	>75



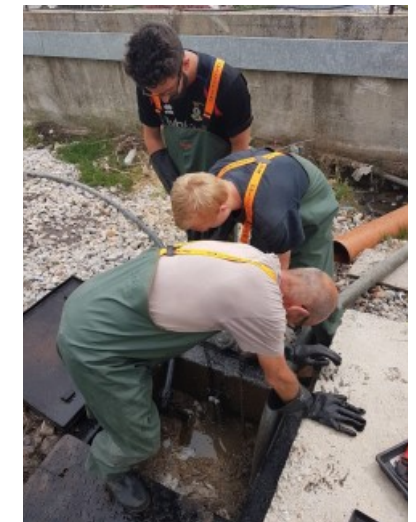
Laying a sewage pipe



The glamorous side of our work



One of the more severe sewage leaks we have seen, on Level Three



Diving in to service the main sewage pump



# Electricity

## Electrical repairs and new connections

Due to overpopulation in the camp, the existing electrical systems are often overloaded, and numerous unsafe connections are made all over Moria, as residents connect up their tents themselves.

Trying to overcome this and prevent the risk of electrical fires and electrocutions, we have been working with contractors with the aim of providing safer electrical solutions.

After conducting an electrical assessment of the camp in February 2018, our electrical team have since made numerous repairs to the system; trying to ensure that all the connections are safe, rewiring fuse boxes and installing cages (to lock them up and avoid further damage, unsafe connections and electrocution hazards).

In the Winter of 2017/18, and again in the Autumn of 2018, we made mass repairs to the systems in the 'Levels,' and implemented a project to connect as many tents as possible to a safe electrical source, giving residents the ability to connect up vital electrical devices such as small heaters and electric blankets.

Overall, we have installed more a dozen new fuse boxes, repaired over 50 more, replaced more than 100 breakers or fuses, installed

over 150 lights and laid almost three kilometres of electrical cable.

Although some of this work is centered around large-scale upgrades to the system, much of it is constant and ongoing, as damage to the electrical boxes and the system in general is a very common occurrence.

### Summary

Fuse Boxes Repaired	>50
Fuse Boxes Installed	12
Fuse Box Cages Installed	16
Electrical Cable Installed (m)	>2800
Breakers / Fuses / RCDs Replaced	>100
Lights Installed	>100



High wire act



A maze of electrical connections running to tents



A newly-installed electrical box



Our resident electrician



# 🏠 Maintenance

Keeping everything in working order

Soon after our arrival in Moria camp, we realised that without the regular maintenance of WASH facilities, the efforts we had made to reopen facilities would be undone. Maintenance and repair work prevents small, easily-fixable issues from inevitably causing huge problems, if left unsolved.

Over the course of the year, the arduous amount of maintenance that is required in order to ensure the existing facilities are in a usable state has often stretched our team to their limits, but this is a vital part of our project here.

By May 2018, we had enough volunteers to ensure that the ‘maintenance rounds’ were conducted every working day. This consists of checking all the WASH facilities; that is every toilet, sink, shower and tap in the camp for faults and making small repairs on the spot. For example; changing valves, replacing locks, changing toilet cisterns, unblocking toilets and replacing floats etc. These maintenance checks are also a vital way of identifying larger problems, and investigating areas where we will need to do heavy or complicated work.

By September, our team, which was growing both in numbers and experience, was able to split the rounds between two sub-teams, meaning that four dedicated maintenance volunteers could complete ‘the rounds,’ in just a couple of hours.

As well as the daily rounds, we have completed several maintenance projects, including: entering the Detention Centre on several occasions to conduct mass repairs, replacing old, damaged plumbing with polypropylene piping in communal facilities

all over the camp, conducting regular and thorough WASH assessments, replacing broken flush systems with a rope pulley system, and deep cleaning facilities on a regular basis, including underneath containers, inside drains and on the ‘wash pads.’

## Summary

Small repairs: toilets and cisterns	>400
Small repairs: showers and shower heads	>300
Taps Repaired / Replaced	>220
Locks Installed / Replaced	>250
Doors Repaired / Replaced	34
Bidet Sprayers Repaired/ Replaced	>200
Drains Unblocked	>100
Toilets Unblocked	>400
Leaks Fixed	countless
Small Problems Fixed	countless
Roofs Sealed	>60



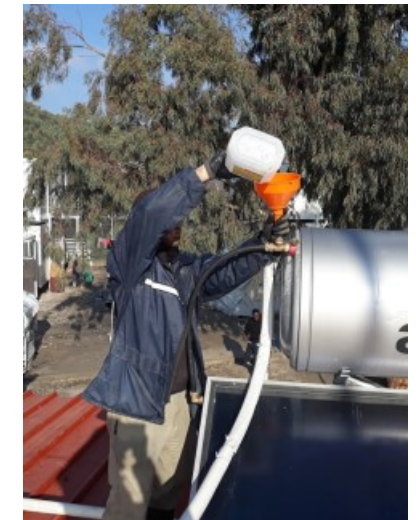
Our most beloved piece of kit - the “poo pumper”



Cleaning and servicing one of our ‘wash pads’



Replacing taps on some outdoor sinks



Topping up the glycerine in a boiler



# WASH Assessments

## Measuring our impact

Since our arrival in November 2017, we have been conducting regular WASH assessments in order to monitor the conditions and availability of WASH facilities for the residents. We conducted the preliminary assessment, just before commencing our work on the 14th of November 2017.

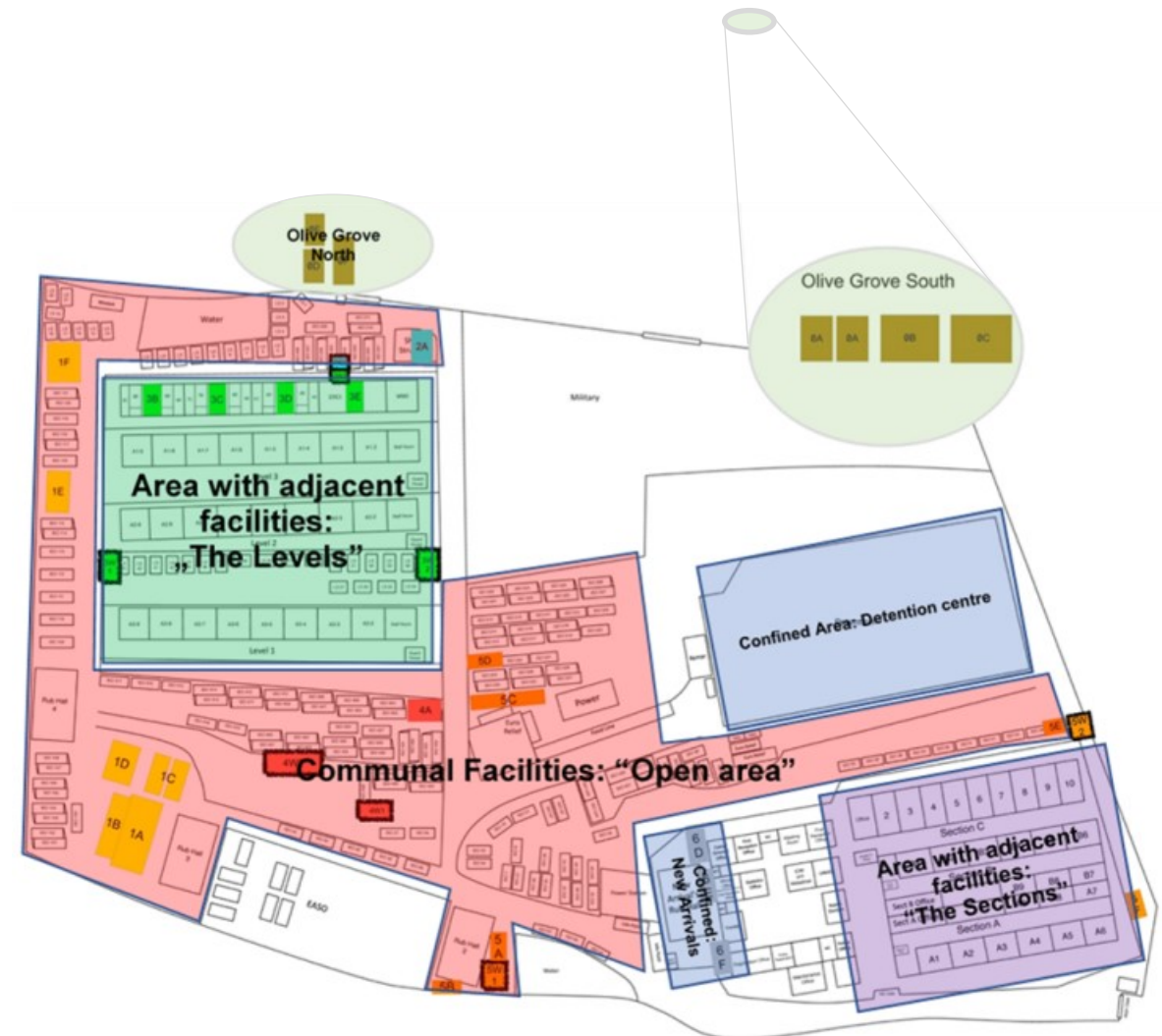
Since then, we have inspected the available facilities roughly every three months; we do this to monitor the progress we make, also, to identify the areas that require further attention and, finally, to derive operational job lists from the data. However, whilst we have data for the communal facilities of the “Open Area”, the “Levels”, the “Sections” and “New Arrivals” areas of the camp from November 2017, at the time we did not have access to the Detention Centre or conduct the assessment in the “Olive Grove,” as there were no facilities apart from a couple of ‘portaloo’s. Furthermore, our preliminary assessment was done during a time when we were not as familiar with the camp, which may have resulted in less accurate data than the successive assessments. Lastly, we cannot claim that the progress or differences shown in this report are solely due to our work. Other actors, especially RIC (First Reception) and MSF have contributed to the improvements that are displayed by the data.

The map on the right shows all of the communal facilities that we have built, converted or upgraded during the last year. Whilst we also worked on “shared” facilities (those which are adjacent to or inside shared accommodation units; in the Levels and Sections, as well as in the Detention Centre) their location is not indicated below.

The different areas that will be discussed in this comparison are highlighted in the map on the right and categorised into;

- Communal facilities of the “Open Area,”
- Shared facilities in the “Sections”
- Shared facilities in “the Levels”
- Communal facilities in the “Olive Grove”
- Communal facilities within the confined areas of the camp (New Arrivals and Detention Centre)

Whilst it is possible to look at the data across the entire camp, this would not display the complete story, as the availability of facilities can vary widely between different areas.



# Open Area

The main area of the camp

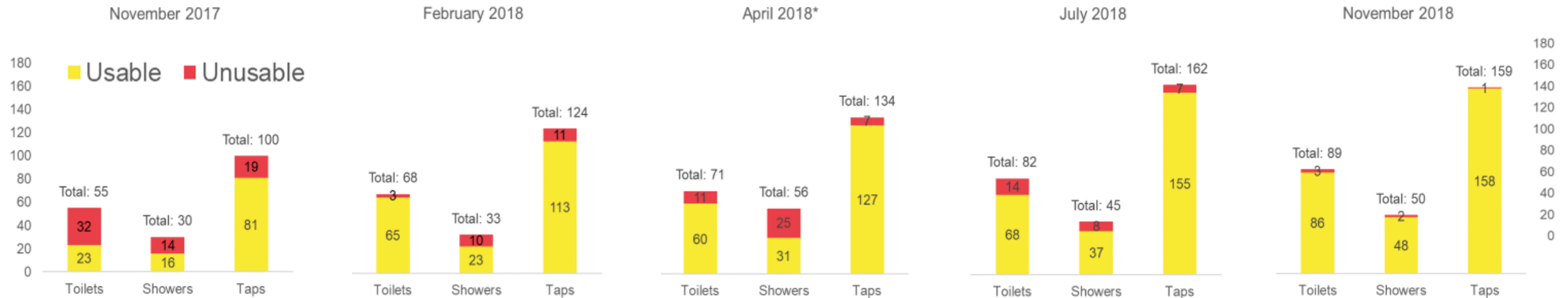
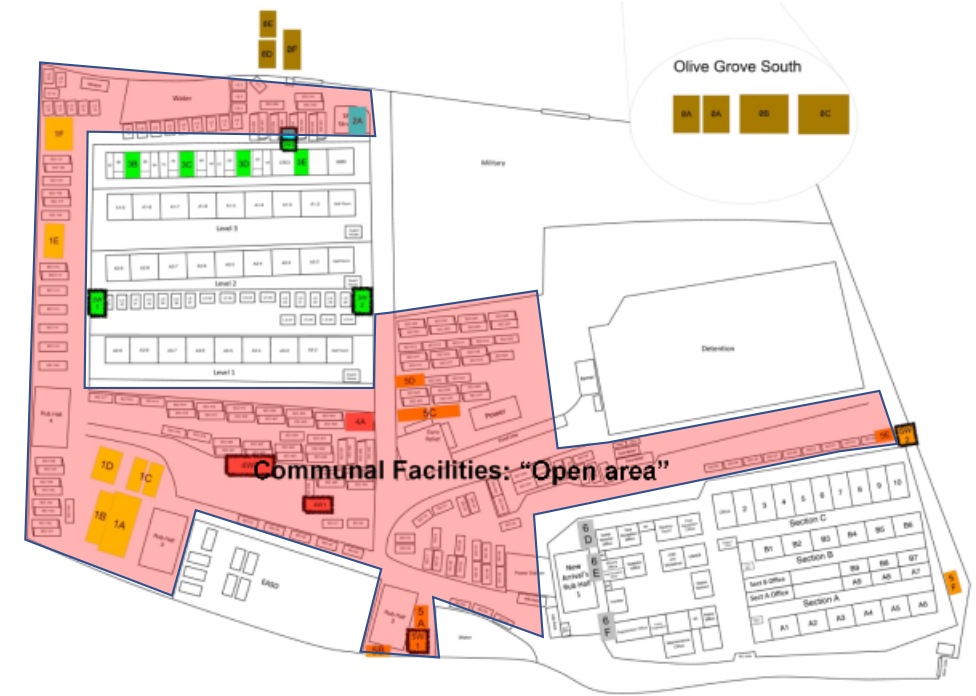
Upon our arrival in November 2017, we counted a total of 23 usable toilets, 81 working taps and 16 usable showers in the communal facilities of the open area. Initially, we focused all our efforts on repairing the facilities in this area. We renovated and opened formally unused buildings and were able to significantly increase the number of working and available facilities, within a very short time period.

By mid-February 2018, we had increased the number of usable toilets to 67, the number of working taps to 113 and the number of available showers to 23. Whilst we have continued to work on the facilities in this area by converting and refurbishing containers, the impact we made during our first three months in Moria appears to be far higher than of the remaining

nine months. Despite what the data suggests, it is very important to note that the only reason why the initially unusable facilities continue to work is due to the tremendous effort we put into maintaining them.

It is not uncommon for us to unblock, replace, or repair more than 70 toilets, 25 showers and 20 taps within one month (data from July 2018). This kind of work is not evident from the snapshot of one moment in time portrayed by our WASH assessments.

The five graphs below show the total number of facilities as well as the number of usable and unusable facilities, at the time of our WASH assessments.



\*In Spring, we tried installing combi toilet/showers into one of the toilet buildings. However, after repeated theft of shower hoses and heads we had to discontinue this effort in that facility, resulting in a lower number of showers in the July assessment.



# The Levels

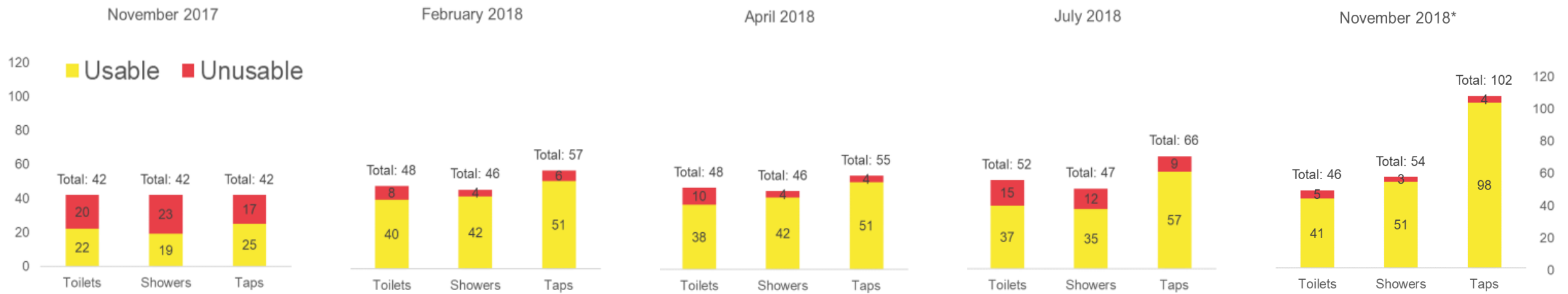
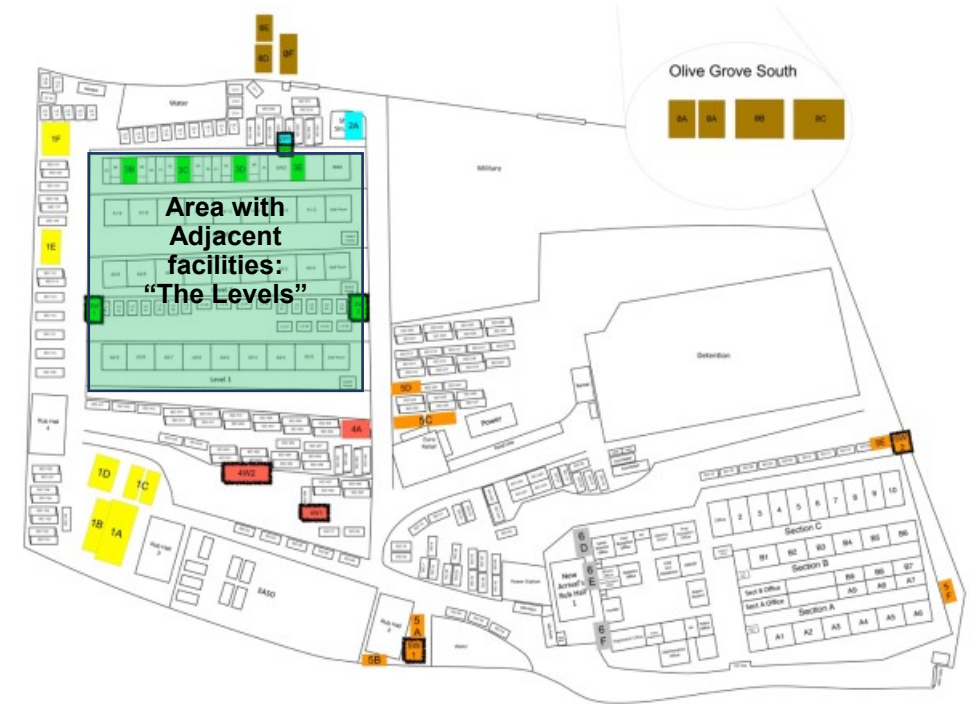
## Shared bathrooms inside accommodation

Although the “Levels” are part of the open area of the camp, (meaning that residents are neither confined in the area nor that access to the area is restricted) the WASH facilities within are inside accommodation spaces and are therefore shared, not communal.

Despite the fact that many facilities were broken when we arrived - roughly 50% were unusable - the overall condition wasn't comparable to the awful state of the communal facilities in the rest of the open area of the camp. Whilst we started with repairs soon after our arrival, the work was not as substantial as in the other parts of the camp.

Furthermore, due to the nature of being attached to housing units and the fact that the facilities were, in general, in a better state, complete refurbishing was not necessary apart from in rare cases.

The five graphs below show the total number of facilities as well as the number of usable and unusable facilities, at the time of our WASH assessments.



\*In November, at the request of residents on Level Four we transformed two toilet buildings into showers, reducing the number of toilets by six.

# Confined areas

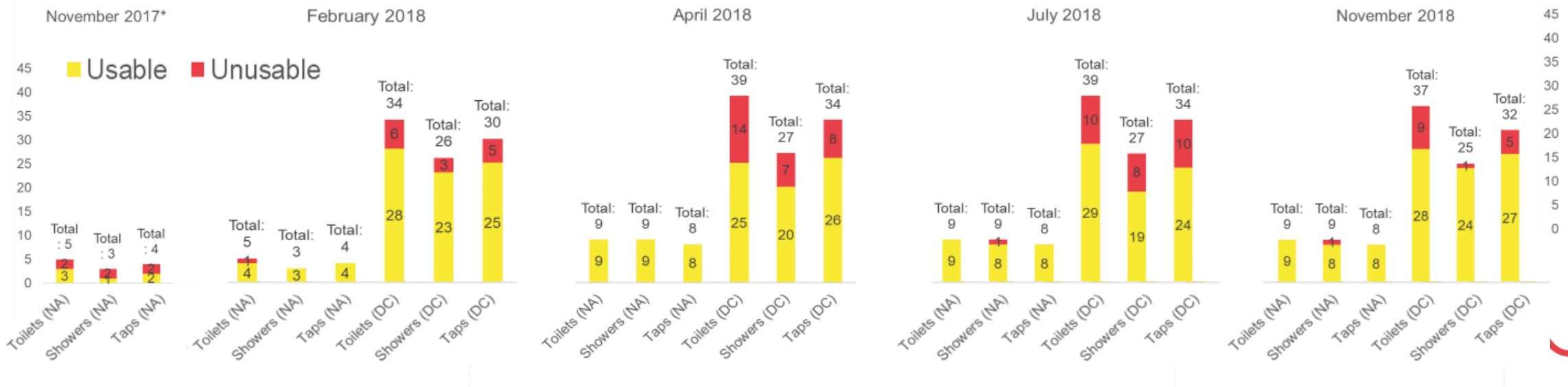
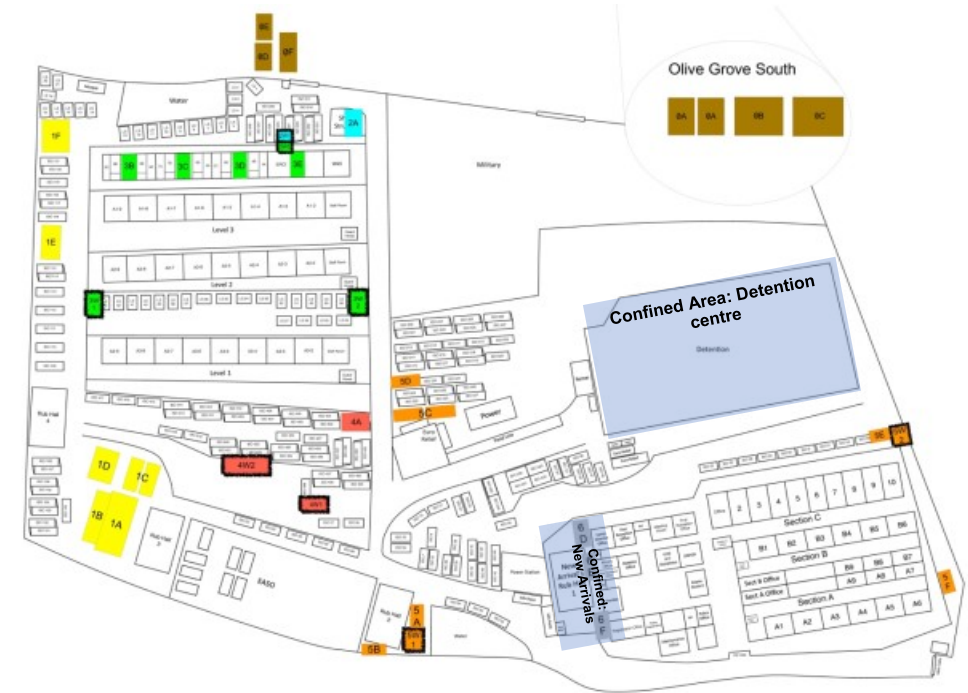
## Detention Centre and New Arrivals

Whilst the residents of Moria camp are usually not restricted in their movement, there are two exceptions: rejected asylum seekers are detained until their deportation in the so-called “Detention Centre” and newly arriving migrants are detained in an area called “New Arrivals” until they have been registered with authorities.

The sanitary conditions of the New Arrivals area were abysmal upon our arrival in November. Within this area hundreds of people were housed, but facilities were limited to a single toilet container with disintegrating walls and floors and just five toilets. After our initial repairs, we soon realized that a complete refurbishment of the container was necessary. However, due to the amount of time such a project requires, we first had to focus on the communal facilities in the open area.

It must be noted that it took more than two months before we were granted access to the Detention Centre, in order to undertake much-needed repairs. Therefore, we do not have data for the Detention Centre for November 2017. Furthermore, because we need to be granted special permission every time we enter, the Detention Centre is not included in our daily maintenance rounds.

The five graphs below show the total number of facilities as well as the number of usable and unusable facilities, at the time of our WASH assessments in both confined areas of the camp.





# The Sections

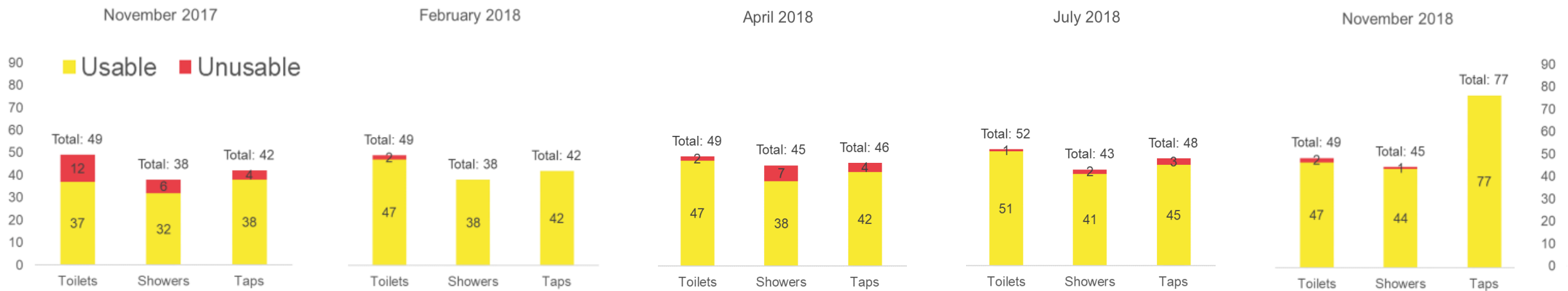
## Protected areas for vulnerable residents

The “Sections” is a protected area of the camp with accommodation spaces shared by up to a dozen people, most of which have ensuite WASH facilities. This area is only accessible to those who are housed here, who are all particularly vulnerable cases, such as unaccompanied minors, single women, LGBT people and refugees with disabilities.

The Sections are directly adjacent to RIC (the official maintenance entity of the camp). Because of this proximity and due to the vulnerability of its residents, this area has always received special attention, even before we arrived.

Nevertheless, we have been making repairs and helping to maintain the facilities in this area since our arrival in 2017.

The five graphs below show the total number of facilities, as well as the number of usable and unusable facilities, at the time of our WASH assessments in the Sections.



# The Olive Grove

## Moria camp's "overspill" area

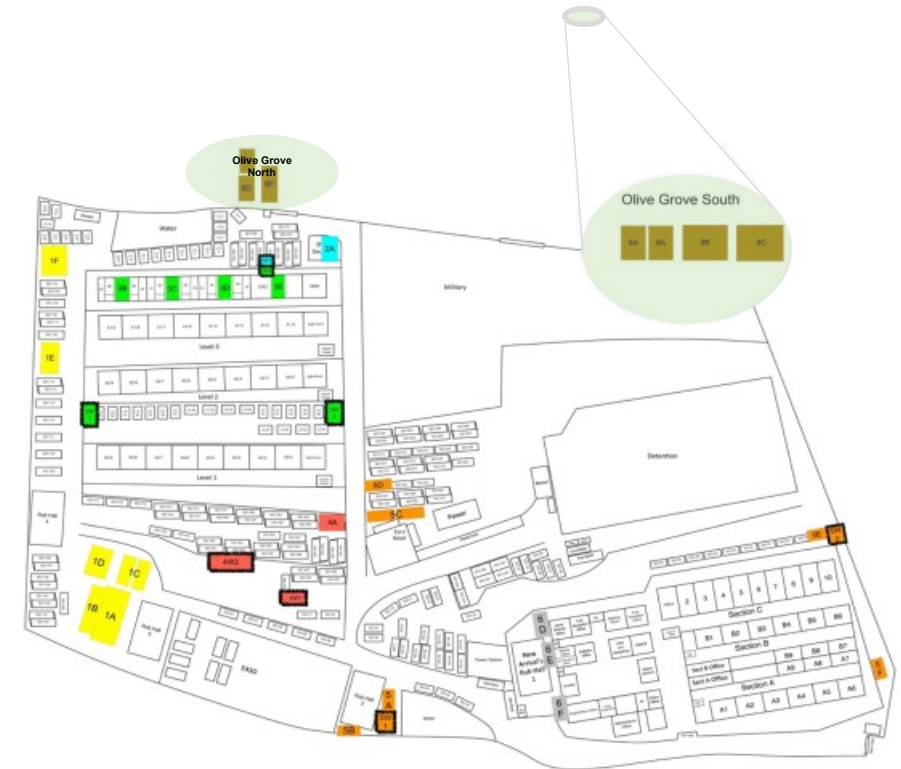
When we arrived in November 2017, the overspill of Moria camp, located directly outside the fence, contained no WASH facilities, apart from a few 'portaloo's and a couple of sinks.

Initially, we focused our work entirely within the official camp itself and we only started working in the Olive Grove after the installation of several WASH containers, provided by MSF. Therefore, the first data that we collected is from April 2018, after the first containers arrived in March.

Whilst we did not build or buy the containers ourselves, we helped to draw up the designs for the builders in Athens, were heavily involved in their installation and, amongst other

things, connected those located in "Olive Grove North" to the water supply and the sewage system of Moria camp.

The three graphs below show the total number of facilities, as well as the number of usable and unusable facilities, at the time of our WASH assessments in the Olive Grove.

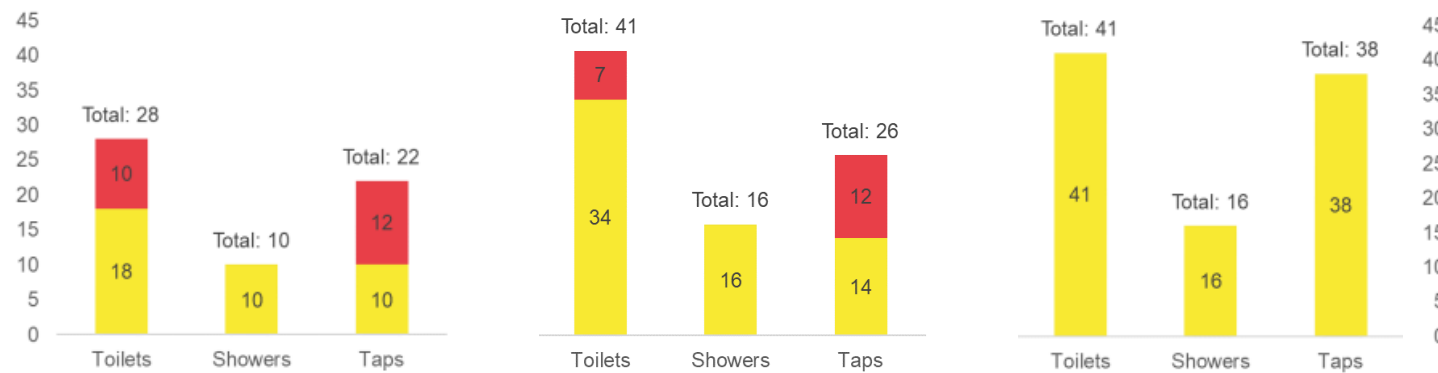


April 2018

July 2018

November 2018

■ Usable ■ Unusable





# WASH assessment data

## Whole camp overview and data adjustment notes

In order to show the overall development of the WASH facilities within Moria camp and the Olive Grove, we have made the following data adjustments.

We have not used the data from the preliminary assessment in November 2017 in this overview, as we did not have access to the Detention Centre during this assessment. Using this as our baseline would give a false image of the impact that we have had, as by the next assessment the number of facilities significantly increases, due to the Detention Centre being counted. It is worth noting that between the first two assessments we completed a vast amount of work to ensure that the majority of the facilities in the Open Area were turned from an unusable state to usable, which is not displayed in the data of this overall comparison.

The data from April is the first to include all of the facilities now present in camp (including those installed in the Olive Grove). Before then, we did not

collect any data from that area, seeing as it was neither connected to the water supply nor the sewage system. However, as the previously uncounted facilities only amount to a few 'portaloo's and a couple of sinks, we have chosen to use the data collected in February 2018 as a baseline for our progression, which is why we must emphasise that there is a margin of error in this comparison.

Therefore, we stress that it is necessary to look into the comparisons of the different areas to get the full picture of our work; percentages of usable facilities in each area can be seen in the table on the right.

Nevertheless, for an overview, below are four graphs showing the total number of facilities, as well as the number of usable and unusable facilities, at the time of our WASH Assessments in Moria camp.

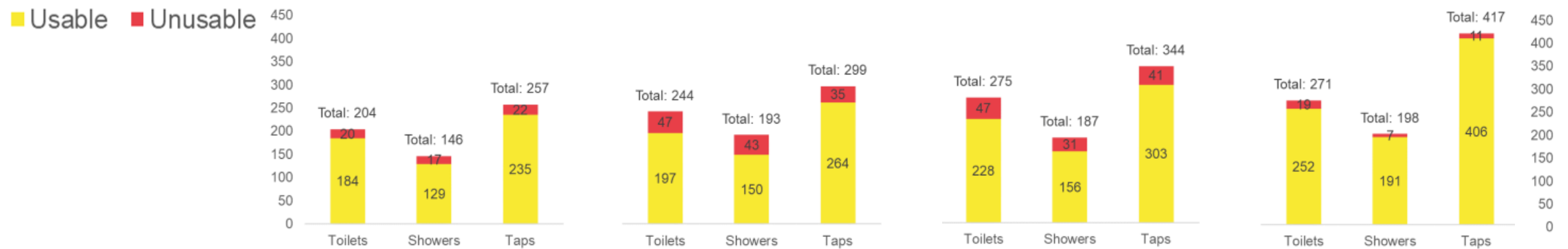
Usable facilities (%)		Nov-17	Feb-18	Apr-18	Jul-18	Nov-18
Open Area	Toilets	42%	96%	85%	83%	97%
	Showers	53%	70%	55%	82%	96%
	Taps	81%	91%	95%	96%	99%
Levels	Toilets	52%	83%	79%	71%	89%
	Showers	45%	91%	91%	74%	94%
	Taps	60%	89%	93%	86%	96%
New Arrivals	Toilets	60%	80%	100%	100%	100%
	Showers	33%	100%	100%	89%	89%
	Taps	50%	100%	100%	100%	100%
Detention Centre	Toilets		82%	64%	74%	76%
	Showers		88%	74%	70%	96%
	Taps		83%	76%	71%	84%
Sections	Toilets	76%	96%	96%	98%	96%
	Showers	84%	100%	84%	95%	98%
	Taps	90%	100%	91%	94%	100%
Olive Grove	Toilets			64%	83%	100%
	Showers			100%	100%	100%
	Taps			45%	54%	100%
OVERALL	Toilets		90%	81%	83%	93%
	Showers		88%	78%	83%	96%
	Taps		91%	88%	88%	97%

February 2018

April 2018

July 2018

November 2018



**Thank you for supporting our project in Moria, and making all of the work we have done this year possible.**

**If you need any further information, please don't hesitate to get in touch with us.**



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