



# ColiMinder

rapid microbiology

by  
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SOLUTIONS

# Driving LAB

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This information covers mobile measurements with the ColiMinder.

## Application Examples – LE version ColiMinder operated in car



FIGURE 1: ERU (COLIMINDER EMERGENCY RESPONSE UNIT) IN A CAR



FIGURE 2 (FROM LEFT): ERU FRONT SIDE | ERU REVERSE SIDE | COLIMINDER MOBILE FOR SCIENTIFIC USE IN REMOTE AREAS

## Mobile deployments of the ColiMinder

VWMS is offering LE Versions (low energy) of the ColiMinder. The respective devices run on 12V DC and got a power consumption of between 30W and 55W depending on operational conditions.

The LE version is offered in different configurations, depending on the intended use.

The ERU (Emergency Response Unit) is the “full version” of these different configurations. It is designed to have everything on board, it can be moved from the lab to a car without stopping measurements.

All devices are equipped with an internal 3G/4G modem to enable remote control and online data transfer.

For scientific use or in special projects which require to access remote areas VWMS can supply a ColiMinder Mobile version.

## ColiMinder CMI02 LE operated in a car measuring different tap water samples

The ColiMinder named „Queen“, mounted on a rack and equipped with two batteries has been operated in a car. Different tap water samples have been taken and measured.



The batteries (2x20 Ah) got enough capacity to perform 15 hours of continuous measurement (31 measurements).

The batteries can be recharged by the 12DC – outlet of the car. The system has no problem to measure while driving, vibrations do not influence the measurements.

The results graph shows different contamination levels (total activity) of different tap water sources.

According to our experience tap water is considered

- Very good < 10 µU/100ml
- Good 10 to 15 µU/100ml
- OK 15 to 20 µU/100ml
- In question > 20µU/100ml

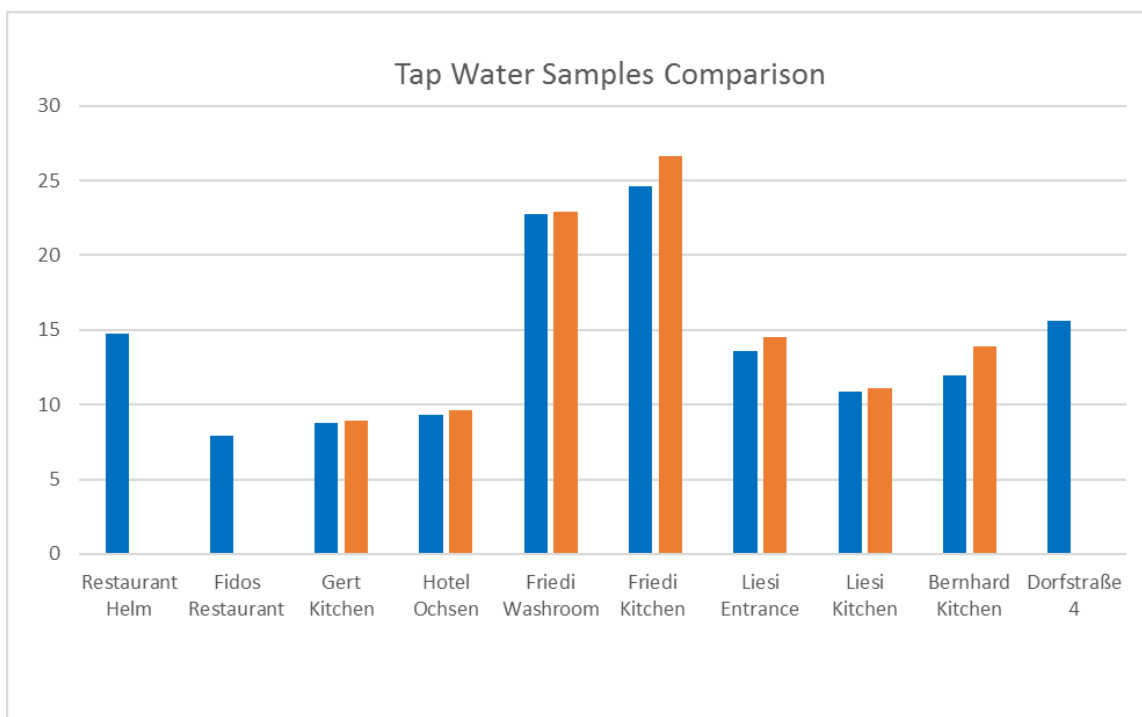
Sterile water usually shows a reading of about 3 to 5 µU/100ml – this should be considered as offset.

The measurements have been performed in winter (January 2019) at an outside temperature of minus 6°C.

Therefore, tap water samples have been quite cold. This explains why the activity measured at the second measurements are a bit higher than the first.

The second measurement has been made about 25 min after the first, in the meantime the temperature of the sample and therefor the activity has increased slightly.

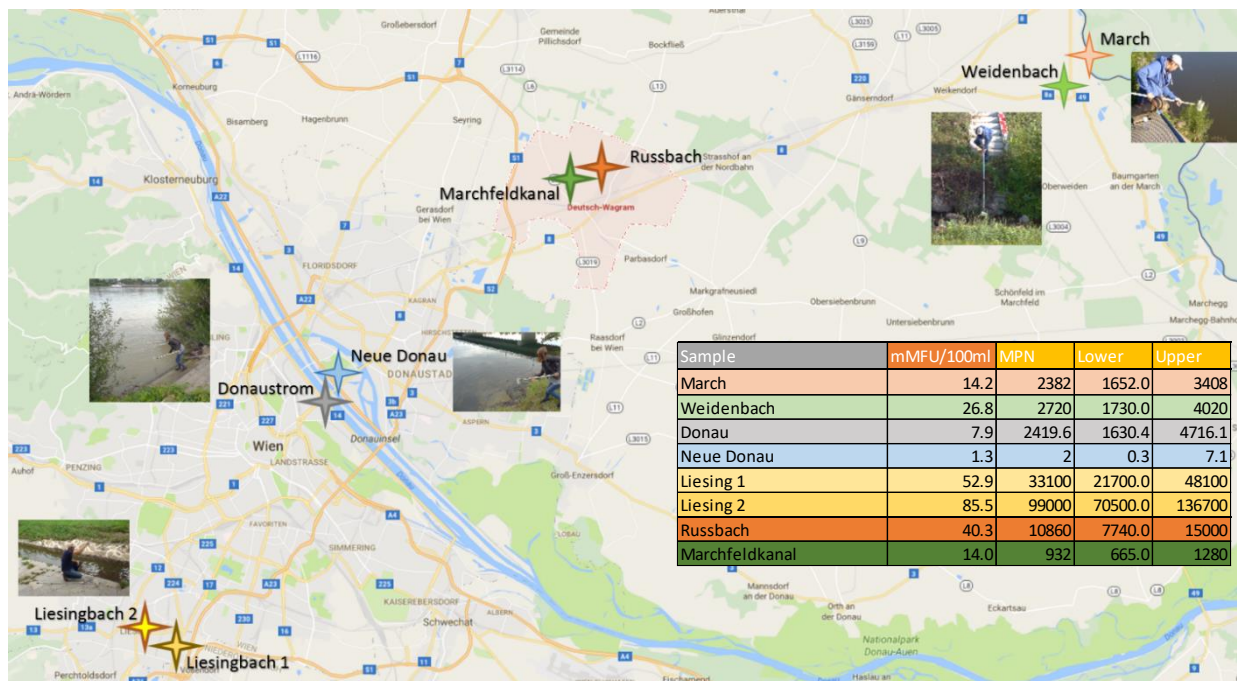
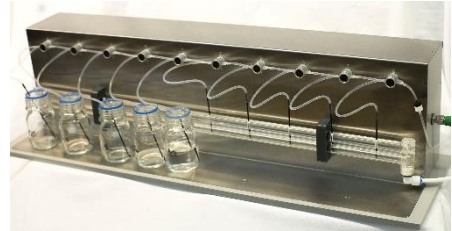
Tap water sample from	1st Measurement	2nd Measurement
Restaurant Helm	14.79	
Fidos Restaurant	7.95	
Gert Kitchen	8.80	8.92
Hotel Ochsen	9.35	9.61
Friedi Washroom	22.72	22.87
Friedi Kitchen	24.58	26.66
Liesi Entrance	13.61	14.50
Liesi Kitchen	10.85	11.09
Bernhard Kitchen	11.96	13.87
Dorfstraße 4	15.62	



## ColiMinder Industrial - Surface water measurements of different water bodies – August 2016

A ColiMinder Industrial LE (low energy consumption -12 V 55W) and a 10-fold sampling module are installed in a car and powered by the 12V on-board electrical system. Data connection of the ColiMinder is established through a hotspot on a cellphone.

Samples are taken driving from sampling point to sampling point and placed within the 10-fold sampling module, being analyzed while driving. Measurement data including sampling site information are being transferred online and live to the server respectively to the headquarters.



For comparison to the traditional culture-based method, each sample has also been stored in a cooling box for later examination in the lab, using IDEXX Quanti-Tray tests.

## Details:

### Sampling:

1. **March** (Zwerndorf Pumpwerk) sampling time: 07:46am
2. **Weidenbach** (Zwerndorf Pumpwerk) sampling time: 07:46am
3. **Donau** (Donauinsel Floridsdorfer Brücke) sampling time: 08:46am
4. **Neue Donau** (Donauinsel Floridsdorfer Brücke) sampling time: 08:55am
5. **Liesing 1** (Turmöl Tankstelle) sampling time: 09:25am
6. **Liesing 2** (Wohnpark Alterlaa) sampling time: 10:15am
7. **Rußbach** (Deutsch-Wagram) sampling time: 11:45am
8. **Marchfeldkanal** (Deutsch-Wagram) sampling time: 11:45am

### Results and comparison to classic lab tests:

Although the samples have been taken from completely different types of waterbodies the results show a similar correlation to MPN results as it has been found in various tests performed before.

Sample	mMFU/100ml	MPN	Lower	Upper
March	14.2	2382	1652.0	3408
Weidenbach	26.8	2720	1730.0	4020
Donau	7.9	2419.6	1630.4	4716.1
Neue Donau	1.3	2	0.3	7.1
Liesing 1	52.9	33100	21700.0	48100
Liesing 2	85.5	99000	70500.0	136700
Russbach	40.3	10860	7740.0	15000
Marchfeldkanal	14.0	932	665.0	1280

The formula to estimate an MPN/100ml value from the ColiMinder reading has been determined using a trend line in excel.

Using the following formula, the estimated MPN have been calculated:

$$[MPNe/100ml] = 2.7025 * (mMFU/100ml) ^{2.3601}$$

The estimated MPNe/100ml values have than been calculated from ColiMinder's mMFU/100ml results and are being displayed in a graph using log scale for MPN/100ml.

