

CARS FOR ENVIRONMENTAL SOIL RESEARCH

For the execution of various types of research in the field more and more often fully equipped cars are used. These cars are fitted with field as well as laboratory equipment. Following the specifications of the client various types of cars can be fitted with a wide variety of equipment. There is a selection of four different modules that serve as basic outfit:

- ☐ Soil sampling
- ☐ Sediment sampling
- ☐ Groundwater sampling and analysis
- ☐ Sampling of residual substances and chemicals

The different modules serve as a guideline for the complete fitting of a car in accordance with your specific application. Installation and equipment of the car is adapted to the outfit selected. If required, the car can be divided into a separate 'clean' and 'dirty' section. The 'clean'-section can be fitted with an overpressure ventilation system with an air purification unit with active carbon. Further options include for instance: a work top with a sink and running water, cooling space, gastight cabinet and a 230 V power supply.

In principle various types of cars, ranging from a van up to an all terrain vehicle, can be equipped as a research car.

Soil sampling

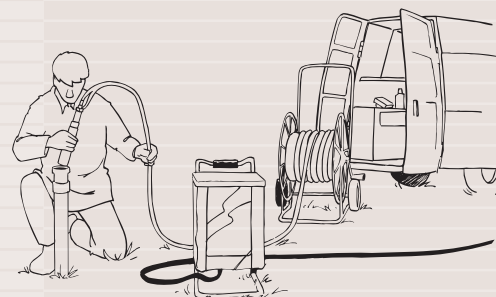
For taking soil samples and drilling holes for monitoring wells the following hand-operated equipment can be used:

- ☐ The bailer boring auger set (01.12.SA) is a set with non-toxic steel soil augers with which soil boring and soil sampling as well as bailer boring can be executed in a wide variety of soils.
- ☐ Using the soil coring kit (04.16) sampling can be executed in soils in which the presence of volatile components must be determined.
- ☐ Undisturbed samples can also be taken using soil sampling rings. The soil sampling ring kit with a closed ring holder (07.53.SC) can be applied in virtually all soils.

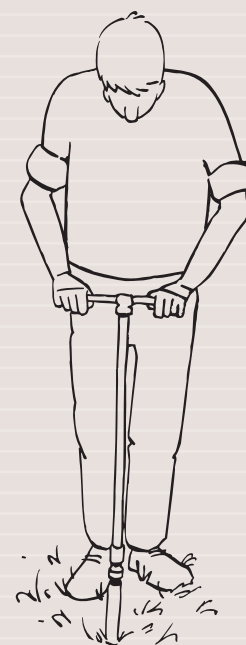


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A submersible pump is lowered into the monitoring well in order to purge it (prior to sampling).



A soil sample is taken to be analysed for volatile components.



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A percussion gouge is hammered into the soil using an electrical percussion hammer.



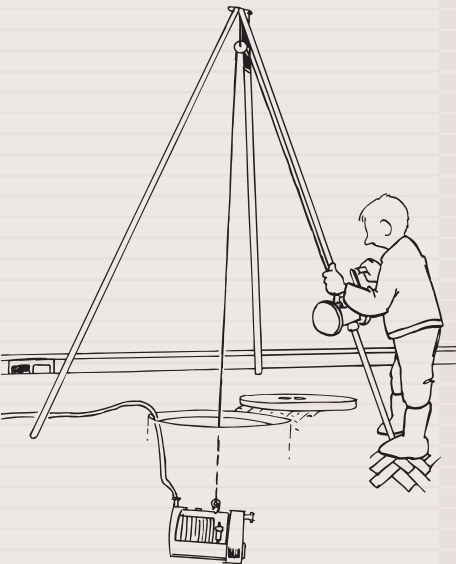
- ❑ If a great number of drillings and samplings must be executed in soils that potentially contain layers of debris and rubble and/or stones a percussion gouge can be used. The set is supplied with a petrol engine (04.18.SC) or electrically driven percussion hammer (04.18.SD). The percussion hammer can also be used for placing monitoring wells applying the 'lost point' drilling method (10.100) and hammering soil gas probes (14.38) into the soil.
- ❑ In order to remove casing tubes or equipment from the soil in an efficient and ergonomically responsible way various extraction tools, tripods and winches are available.

Sediment sampling

For the sampling of the beds of rivers and channels as well as for harbours, etc. various samplers are available.

- ❑ Undisturbed sediment samples can be taken with the Beeker sampler (04.20.SA).
 - ❑ In deeper water cable operated sediment samplers can be used. Using the free-fall corer (04.29) reasonably undisturbed samples can be taken. Using the Van Veen Grabs (04.30) disturbed samples can be taken.
 - ❑ Sampling of suspended sediment can be executed using the sampler called 'Watertrap' (12.02).
 - ❑ Semi-disturbed depth specific samples of watery, soft sediments can be taken using the peat auger (04.09).
- The cars of course can be fitted with equipment for:
- ❑ Soil physiological research.
 - ❑ Soil gas sampling.

Using the tripod and the hand-operated winch a pump is pulled up from the sewer.



Completely equipped van

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Groundwater sampling and analysis

Groundwater sampling usually takes place from monitoring wells. For purging and sampling a variety of articles is available:

- ❑ Water levels and possible floating layers can be detected using the floating layer thickness meter (11.08) or with the liquid layer sampler (12.41), which is also suitable for depth specific water sampling.
- ❑ The micro-processor controlled peristaltic pump 12 Vdc (12.25) can be used for sampling and in-line filtration of groundwater from monitoring wells with a maximum water level of 8 m. By connecting a level sensor it is possible to sample in a controlled way or to purge the filter pipe without the risk of aeration.
- ❑ Purging and sampling monitoring wells with a deeper groundwater level can be realized applying a submersible pump MP1 (12.27).

- ❑ Monitoring wells with a small diameter but with a groundwater level at great depth can be sampled with a manually (12.13) or electrically operated (12.15) foot valve pump (particularly suitable for sampling of volatile material).
- ❑ The in-line filtration of groundwater can be done using a filter holder with exchangeable membranes (12.31) or with disposable filters (12.30).
- ❑ Disposable articles which in order to prevent cross-contamination are used only once, such as: monitoring well pipes, tubes, filtration material, bentonite, etc.

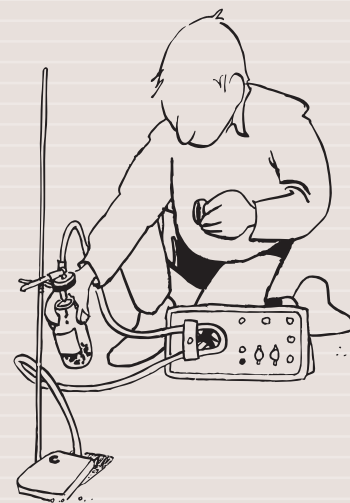
Various analysis of the groundwater can be executed with:

- ❑ Splashproof meters for accurate measurement of the pH, conductivity, temperature, redox-potential and oxygen content. By using a flow-through cell the meters can execute in-line measurements (auto-logging possible).



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Using a peristaltic pump 12 Vdc and a disposable filter the sample is filtered immediately in the field.



The analysis is executed immediately in the van.



Work top with sink and running water



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The cars can also be equipped for:

- Soil moisture sampling.
- Sampling of waste and surface water.
- Water drainage measurements.

measurement of floating layer thickness and the sampling of vessels, tanks and gully holes.

- The cable operated liquid layer sampler (12.41) is applied in deeper tanks, basins, etc.

Sampling of residual material and chemicals

For the sampling of waste, etc. by the various supervising and inspecting bodies such as the environmental police and customs different samplers have been developed.

- The sampler for oil separators (12.45) with respect to its operation is very similar to the cable operated liquid layer sampler.

- The Check-kit Chemviro (20.05) houses several materials for the sampling of hard, soft and fluid waste material, chemicals, water, sludge and soil.

- The multisampler (12.42), an universal instrument, to take undisturbed core samples of sludges, water submerged sediments as well as liquids.

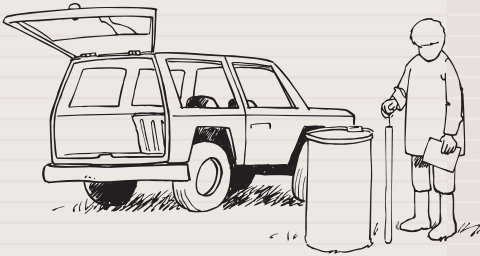
- Using the flap gouge auger (20.07) depth specific samples can be taken from dry and wet material in basins, tanks and big-bags.

- Teflon plunging siphons (12.18) to sample homogeneous fluids from vessels, tanks (for instance tank lorries) and basins.

- The rod operated liquid layer sampler (12.40) for the determination of stratification, the

The research cars can be supplemented with surveying instruments.

A vessel is sampled with the liquid layer sampler.



Sturdy shelves



Aggregate



Compact but complete



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