SAMPLING

- Training of Samling Procedures

dekonta

Seminar program:

- *Purpose of sampling*
- *Terms and definitions*
- *Sampling procedure*
- *Sampling (taking samples)*
- *Preservation, transport and storage*
- *Samples labeling and records*
- *Safety during sampling*
- *Quality assurance*

The training is prepared in accordance with METHODOLOGICAL GUIDANCE OF THE MINISTRY

MoE December 2006

International Organisation for Standardisation (ISO)

ČSN EN adopted European standards

Purpose of sampling:

- a significant part of projects related to research, assessment and remediation of environmental burdens
- the results decide on the further progress of the work and financial costs associated with the implementation remediation activities

-long-term monitoring of groundwater quality and contamination state (monitoring)

- regular control, eg efficiency of remediation facilities, quality control of discharged wastewater, etc.

Terms and definitions:

Representative sample-

a sample should represent the environment that is sampled

- **Program / project** – the sampling procedure from the first step, in which the project objectives are defined, to the last step, in which the results are evaluated
- **Sampling plan** – a predetermined procedure for selecting the location of sampling points, sampling, conservation and transport

- **Sampling point** – clearly and unmistakably defined position of the sampled object in the area of interest

- **Sample taking** – a partial part of the sampling process in which the sample container is filled with sampled material

Sampling procedure:

- Sampling plan
- Choosing of sample containers, laboratories
- Sample taking, sampling protocol
- Preservation, transport to the laboratory
- Handover for analysis, handover protocol

Sampling plan:

- written information for the work of the sampling group/sampler:

- *project name*
- *place (position) and time of collection*
- *method (SOP), type, size and requirements for treatment and transport*
- *quality control*
- *health and safety specifications - protective equipment, etc.*

F/PP 03.0/1/ 090104

dekonta PLÁN VZORKOVÁNÍ pro rok 2017 podzim

1. Zakázka: **Sanace znečištění ropnými látkami v obcích Lunga a Mărculeşti v Moldavsku III. číslo: 116 120 ČRA : MD-2016-009-FO-14020**

2. Vzorkovací skupina: **Martin Polák Ing. + 1 (**Petr Veleba Ing., Aleš Mansfeld, Michal Otevřel)

3. Výchozí podklady a informace

- účel vzorkování: supervize režimního monitoringu podzemních a povrchových vod
- informace o lokalitě a mapové podklady: součástí Metodiky vzorkování v příloze č.1
- charakter / počet vzorků: ---
- stanovované parametry: NEL
- specifikace odběrových míst: mapa odběrových míst – součást Metodiky vzorkování, viz přílohu č.2
- SOP / metodika odběru vzorků: metodikou je dokument, kterého je tento plán přílohou
- druh a objem vzorkovnic: **Sklo 1000 ml**
- duplicitní/kontrolní vzorky: 30 ks podzemní vody
- specifické požadavky na úpravu / transport vzorků: fixace H_2SO_4 (pH < 2)
- BOZP při odběru vzorků: pro základní pravidla viz Metodiku
- termín odběru vzorků: září-říjen 2017
- termín předání do laboratoře: říjen 2017
- požadavky na dokumentaci: **protokol o předání vzorků do laboratoře, laboratorní protokoly, průběžná zpráva Projektu**
- analytická laboratoř: **Akreditovaná laboratoř SERVICIUL HIDROMETEOROLOGIC DE STAT - Directia Monitoring al Calităţii Mediului, adresa: Republica Moldova, or.Chisinău, str.Grenoble 134, MD 2072; laboratoř DEKONTA a.s., Ústí nad Labem** (kontrolní vzorky)
- ostatní subdodavatelé: **nejsou**
- jiné:
  - Kontrolní vzorky budou odebírány vždy pod dohledem Manažera vzorkování.
  - Specifikace odběrových míst kontrolních vzorků bude provedena na místě dle aktuálních podmínek (např. přístupnosti objektu, výskytu volné fáze atd.)

4. Kontrolní činnost (zakroužkovat plánovanou kontrolní činnost):

k) neporušenost odběrného místa	p) **kalibrace měřicího zařízení**
l) vhodnost zvolené metodiky	q) **duplicitní vzorky**
m) reprezentativnost vzorků (počet, frekvence)	r) **povětrnostní podmínky**
n) čistota odběrného nářadí / zařízení	s) ----------
o) čistota vzorkovnic	t) **jiné:**

V Praze , dne.....

Vyhotovil: Polák Přezkoumal: Baťha Schválil: Vaněk

- must have a sampling group in the field
- allows sampling by another sampling group
- allows check the correct way of the samples taking and monitoring of the sampling procedure steps
- contains notes - update the state of the sampled object, etc.
- contains permission to enter the land if it is needed
- possible confirmation of the absence of underground structures/lines at the points of probing

Sampling

Eligibility for sampling - Sampling staff should be sufficiently qualified, trained and verified to know and follow the standard operating procedures, undergo regular medical examinations, and be trained in safety and health regulations, including knowledge of first aid principles

Sampling types:

- Single sampling - simple sample, gives a picture of the quality of the sampled object at the time and place of sampling
- Repeated sampling - tracking quality time changes - monitoring
- Zonal sampling - sampling from different depth levels

Types of matrices:

- Solid and semi-solid
- Liquid incl. multiphase
- Vapors

Water sampling

- The main principle: to perform sampling the way that disturbing of aquifer conditions be minimal

Water

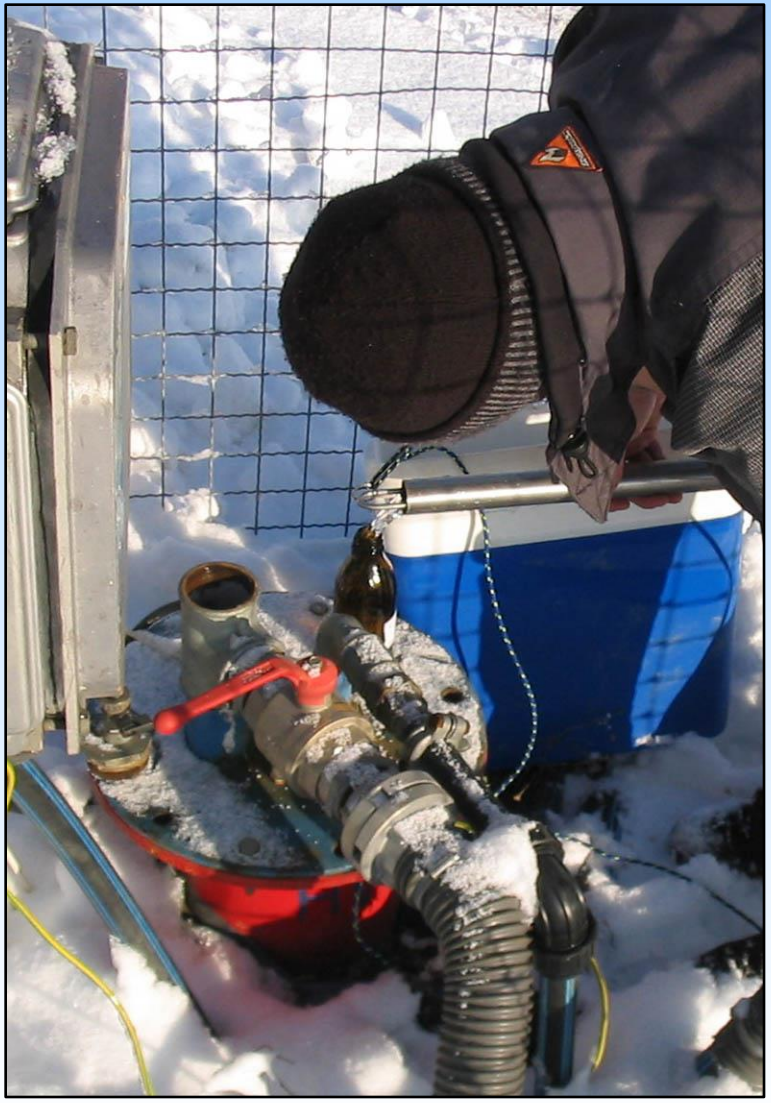
- Sampling in static state

Static groundwater sampling allows to obtain physic - chemical parameters of water in object at the time of collection. SOP 03.0.1.

The described procedure is applicable for sampling from unequipped wells and in justified cases also from equipped wells. The use of static way is given by specific conditions, eg:

- it is an hg object with overflow
- proven vertical flow in the borehole
- presence of free phase on the surface
- damaged well not allowing pumping
- it is not possible to dispose of contaminated pumped water at the site or to dispose of it due to the amount
- static sampling is required by the contracting authority for various reasons.

- free phase of oil substances on the water surface



Sampling with bailer -

– Sampling in dynamic state

Dynamic groundwater sampling alow to obtain physicochemical parameters of groundwater in the aquifer in the vicinity of the sampled object. SOP 03.0.2.

The described procedure is applicable for sampling groundwater from equipped wells to depth over 30 m, from small-diameter or not pumped wells.
Dynamic sampling must also be used for wells equipped with corroding materials, when it is necessary to remove accumulated corrosion products before sampling.

Typical sampling set for dynamic sampling

From the sampled well is pumped required amount of water, usually 3-5 volumes before sampling.
From continuously pumped wells, the sample can be taken directly from a tap to a sample container.

Measuring
the basic parameters
by portable gauge

… **water cell**

Peristaltic pump

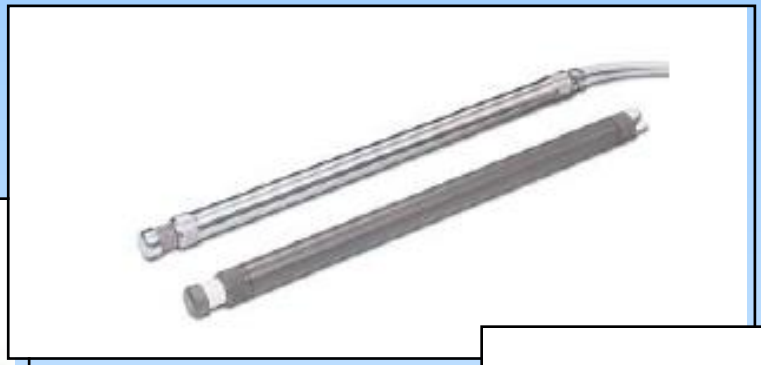
Submersible pump

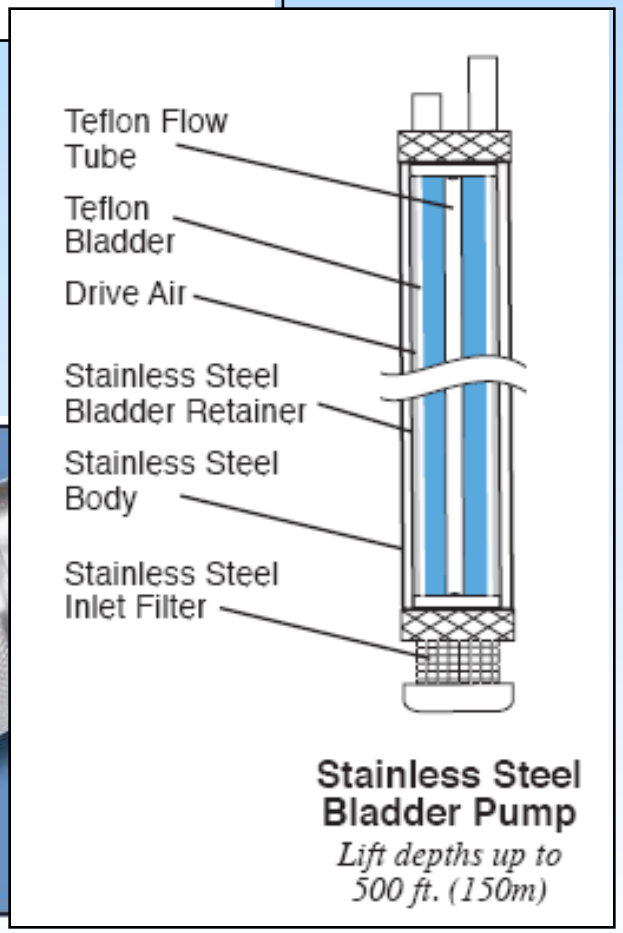
Peristaltic pumps:

Solinst 410

Eijkelkamp

Bladder pump





Basic principles, terms

- **bailers: taking sample from pumped wells (only for taking water from the well surface)**
- **zonal samplers: sampling from a specified well depth**
- **procedure for exploring unknown / known territory (single use bailers, run from clear to heavy cont.)**
- **the sampler diameter should be much smaller than the borehole diameter, the possibility of decontamination is important different types of pumps (submersible, horizontal, peristaltic) with various types power supply**
- **in the case of groundwater contaminated with oil or chlorinated hydrocarbons must be taken into account cont. distribution in vertical profile of the aquifer**
- **floating or heavier phase - determination of layer thickness**
  - **sampling for qualitative analysis**
  - **sampling for finding conc. contaminant in dissolved form**

Sampling record...

ODBĚR VZORKU P.V. V DYNAMICKÉM STAVU

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- příloha k PROTOKOLU O ODBĚRU VZORKŮ č.: .....

Vrt:	Hloubka:	Perforace:	Průměr vrtu:	Výstroj:
Odběrové zařízení:		Typ potrubí/hadice:		H.P.V.:
Odměrný bod:		Datum:		

Čas	h.p.v.	pH	Teplota	Vodivost	Rozp. O2	Poznámky/změny

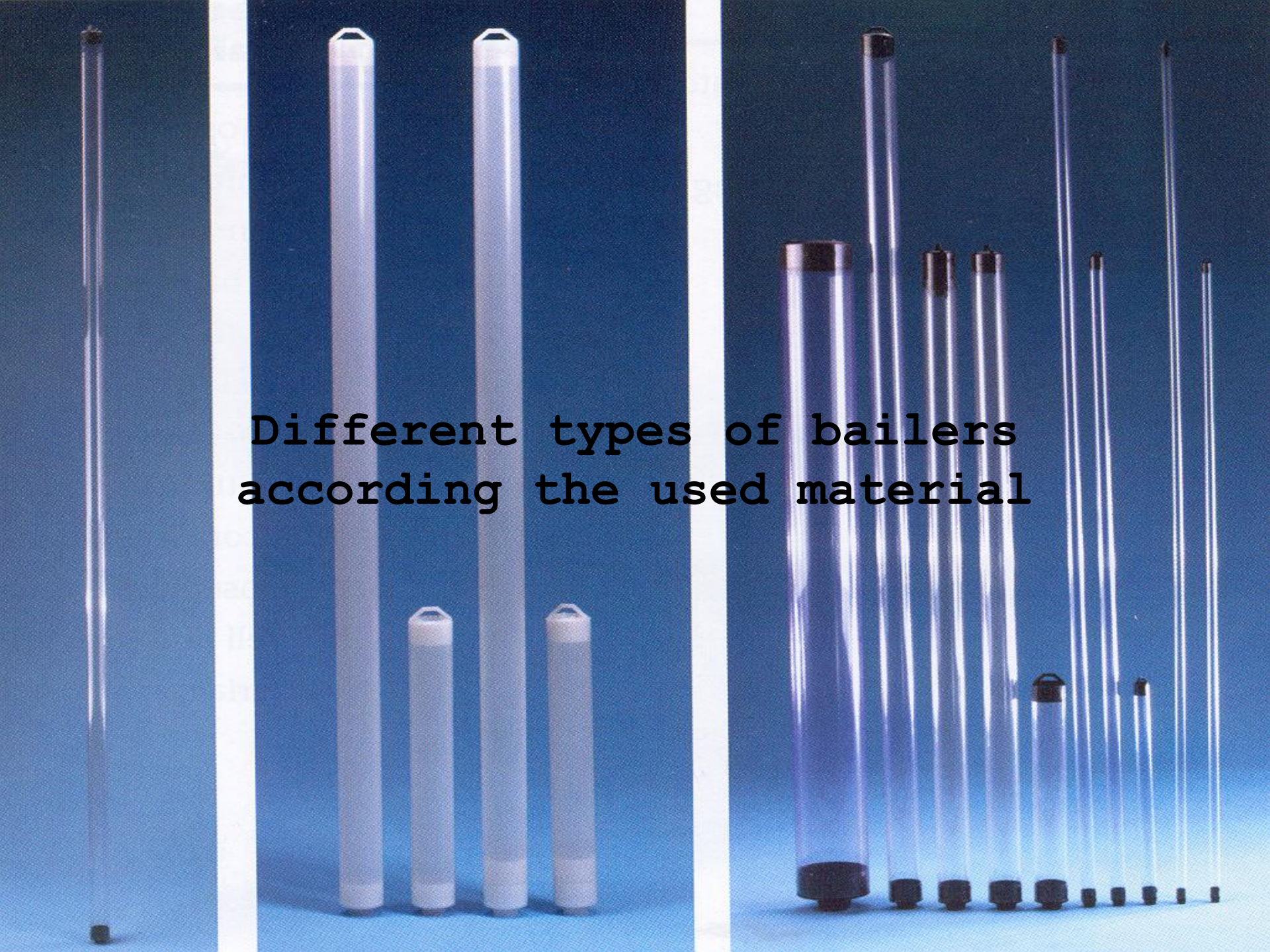
Sampling of surface waters

Sampling equipment - water

exact
point
sampler

bailers – zonal and classics
(stainless steel version)

Teflon bailers – manual measuring of LNAPL/DNAPL


Different types of bailers
according the used material

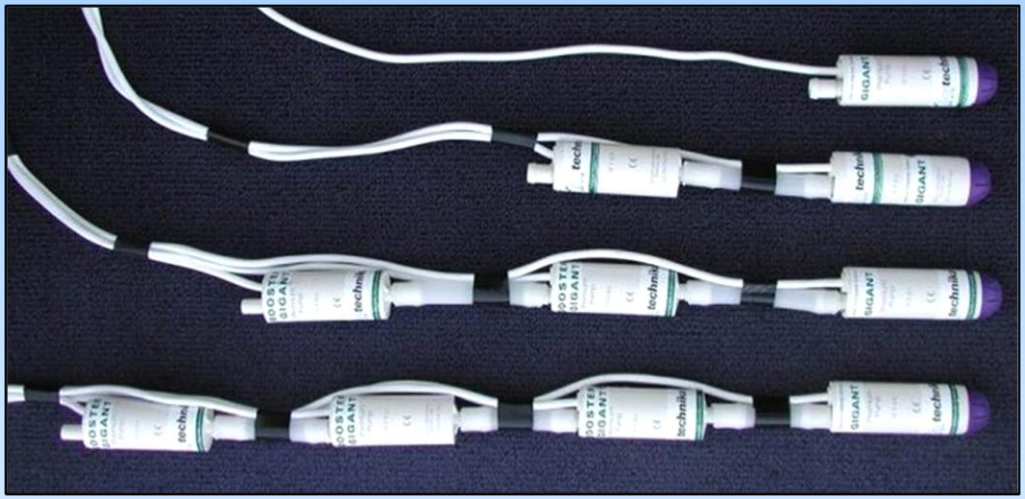
Interface meters:

Czech made NPK …

Solinst IM

Sampling set

Sampling pumps Gigant Eijkelkamp



Submersible pump – luxury set

Sampling of soils, sediments and sludges

-fields of application

Soil and sludge sampling is used to determining the degree, nature and extent of site pollution - unsaturated zones

The results of the analyzes of the samples taken are used in case of contamination to choose the method and extent remedial intervention, for precise determination or confirmation of the boundaries of the contaminated area and to verify the suitability and effectiveness of remediation activities. SOP 03.0.6.

-principle of sampling

From the appropriate depth and place with the help of sampler remove the soil / sludge that is collected in prepared sample container.

Soil samples are taken during drilling - manual or machine, according to individual requirements geological supervisor decisions. Soil samples are removed from the drill core and put into the pre-prepared sample containers in specified quantities according the type and number of required analyzes.

The amount of sample takes ranges from 0.1 to 2 kg according to the lab requirements specified in the sampling plan.

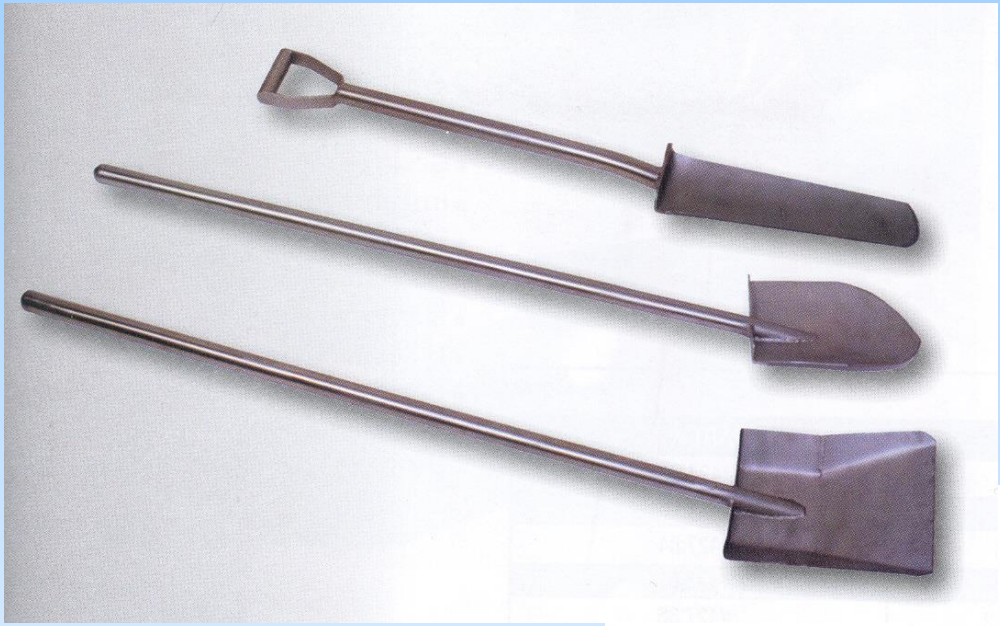
Sample of soil taken by hand drilling set

Soil sample taken from the core of the sampler

dtto


Soil/sludge
sampling equipment

Sludge/sediments samplers



showels

… different types and sizes…

River/lagoon bed sediments samplers

Peat sampler

hand set for soil sampling

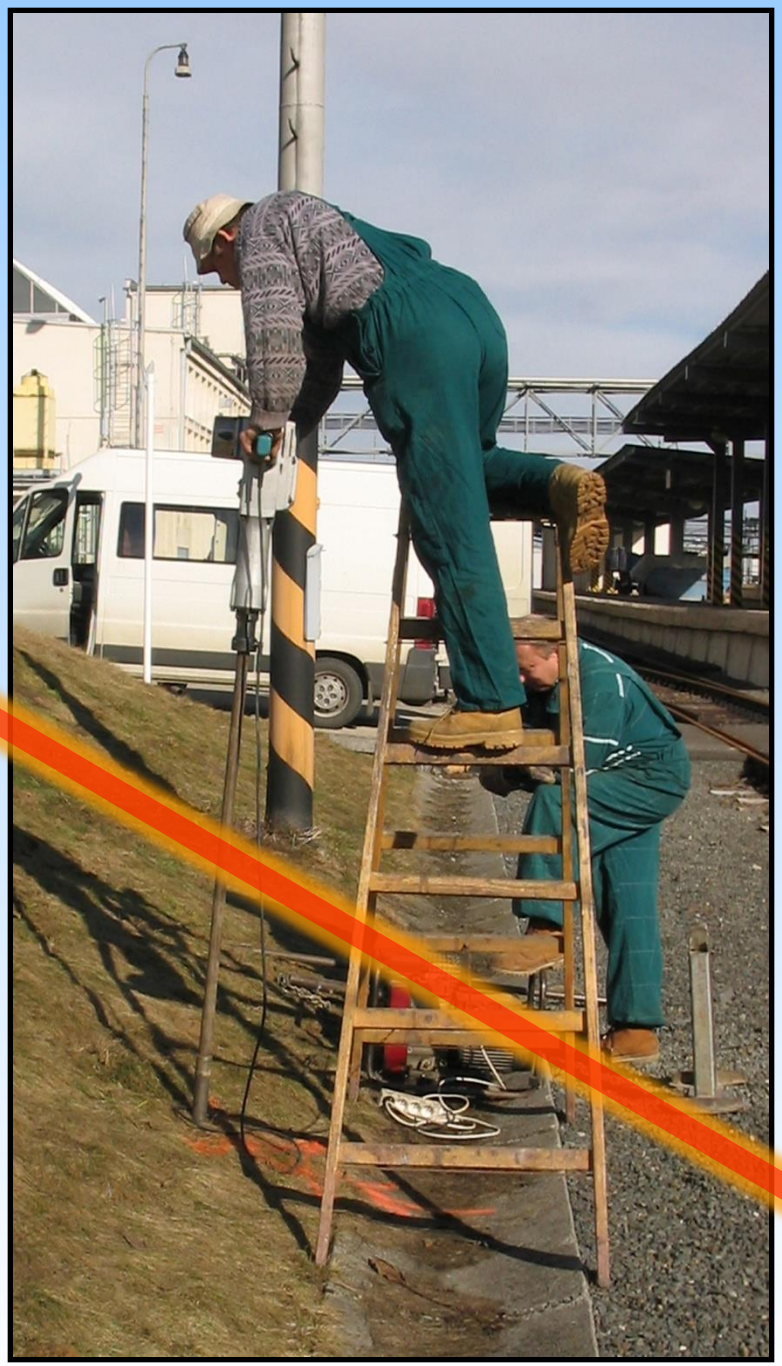
intact soil sample collector

different types of hand drills

Manually operated hammer core sampler – gambo – range of operation up to 5 m

machine hammered core sampler - rage of operation up to 30m

Sampling of bed sediments with Power Probe (GeoProbe) – taking untouched samples, recording of lithology



Air / vapor sampling

- Field of application

Atmogeochemical sampling is used for an overall assessment of the degree, character and the extent of volatile soil air pollution by organic substances. SOP 03.0.4-5

SOIL VAPOR

Survey - principle:

-*non-selective and selective sampling procedure*

-non-selective - portable analyzers(Ecoprobe, Portafid …)

-non-selective procedure – at the first phase for locating critical points, source of cont.

-portable flame detectors devices, photodetection analyzers for petroleum hydrocarbons and volatile chlorinated organic compounds

-selective –sorption on AC, laboratory analyzes

more detailed research, use of sorption tubes

-methods of sampling

- field portable detectors

From the appropriate depth of drilled probe or directly from the hole with help of a perforated needle is pumped air through the inlet hose of the device through the air filter into the analyzer, where the detected values are processed immediately and displayed on the digital display of the device.

Field survey of surface pollution

Pollutant concentration measuring - ECOPROBE venting well; air flow measurement - rotameter

Taking sample by help of sealing cone

Sampling equipment - air, terrain analysis

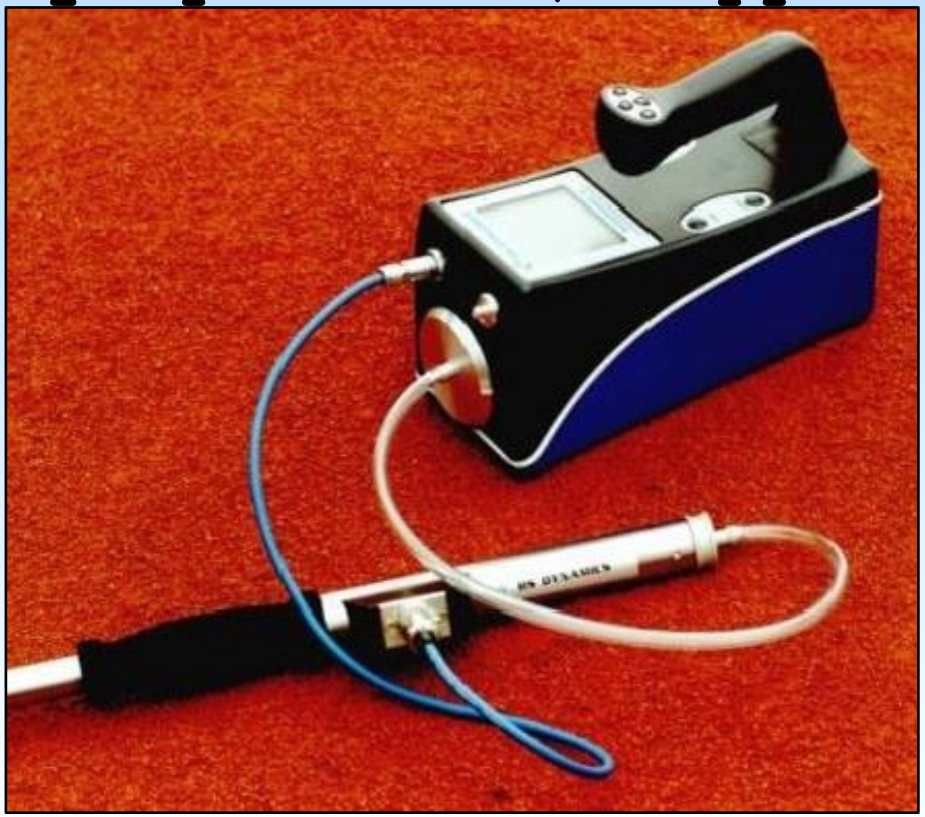
- realization of narrow profile probes for collection sample of vapour

Sampling from probes

Field analysers:

-PORTAFID- flame detection device, sensitivity up to 10,000ppm, no recording

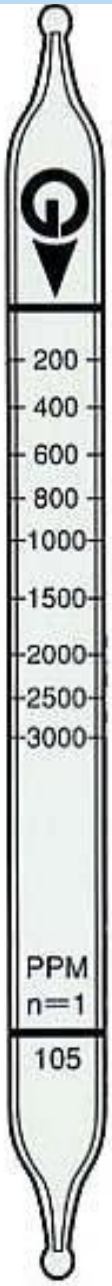
-ECOPROBE 5- photoionization and infrared Detection, sensitivity up to 500,000ppm



- GA 2000 - measuring of landfill gases

-CO_2, CH_4, O_2,H_2S

Collection of air for laboratory analyzes:



- sorption tubes
- manual sampling set

Conservation, transport and sample storage, choice sample containers

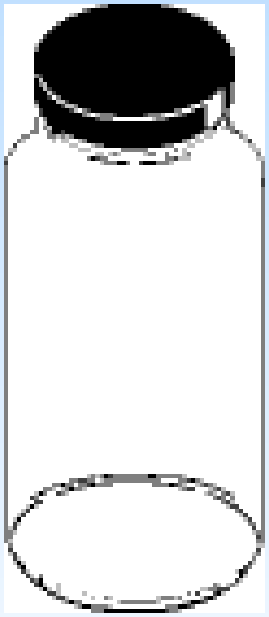
•The transport of samples should be without any delay, at a temperature of max. 4st.C (portable refrigerators).

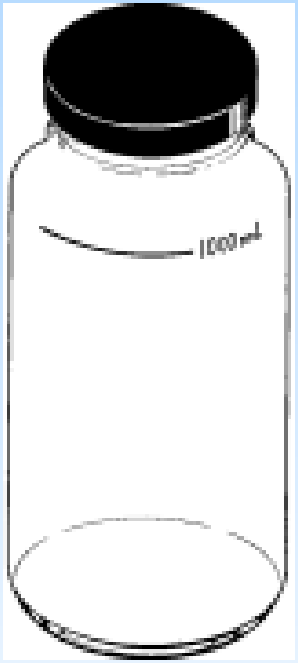
• Sampling for microbiological analyzes must be reported to the laboratory on time (minimum 24 hours before.

•It is recommended to consult the whole sampling process with the lab already at preparing phase a sampling plan

Transport of samples

Labeling samples and recordings / protocols





labels!

název vzorku .....

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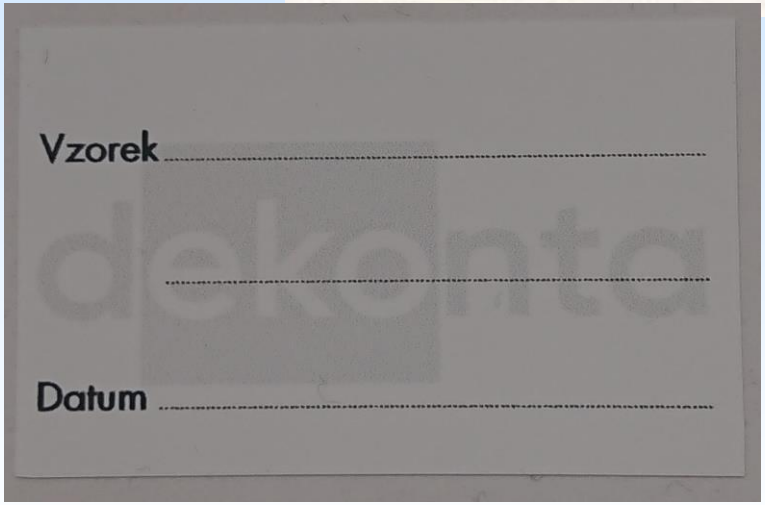
datum odběru ..... odebral .....

lokalita ..... analýza .....

znečištění: slabé střední silné



F/PP 03.0/2/ 181002

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PROTOKOL O ODBĚRU VZORKŮ

č. 2/20

1. Zakázka **(název / číslo): Sanace znečištění ropnými látkami v obcích Lunga a Mărculeşti v Moldavsku III číslo: 116 120 ČRA : MD-2016-009-FO-14020**	
2. Lokalita: Lunga, Mărculeşti - Moldavsko	
3. Účel vzorkování: Režimní monitoring podzemních a povrchových vod	
4. Označení vzorku	ST: 44, 68, 143
5. Vzorkované médium	Podzemní voda z domovních a veřejných studní -kontrolní vzorky
6. Místo odběru	Viz mapu dokumentačních bodů
7. Datum a čas odběru	11.09.2020
8. Metodika odběru	Odběr z používané studny instalovaným odběrovým zařízením
9. Použité zařízení	hladinoměr NPK, WTW
10. Vzorkovnice	Tmavé sklo 1 l
11. Kontrolní činnost **(dle plánu odběru vzorků)**	**l, o, r**
12. Stanovení:	NEL
13. Poznámky:	fixace H_2SO_4

14. Povětrnostní podmínky při odběru – **teplota: 25°C počasí: polojasno**

15. Laboratoř - termín předání: **Laboratorul investigatii de mediu, Kišiněv**

Předáno dne: 18.10.2020

16. Vzorkovací skupina **(vedoucí, členové),** osoby přítomné při odběru (členové moldavského partnera střídavě)**:**

V.Kurkov, Martin Polák

V Mărculeşti , dne 14.09.2020

Vyhotovil: Přezkoumal: Schválil:

DEKONTA, a.s., Volutová 2523, 158 00 Praha 5, tel. 2 35 52 22 52-5

protocol of sampling

protocol for lab with analyses requirements

F/PP 06.0/5/051007

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www.dekonta.cz, laborator@dekonta.cz

DEKONTA, a.s. Dřetovice 109, 273 42 Stehelčeves
Laboratoře Dřetovice : +420 602 133 383, +420 312 292 962
Laboratoře Ústí : +420 724 681 525, +420 475 511 635

Zakázkový list laboratoře

Zákazník / Řešitel:	
Jméno/ ~~Adresa: Martin~~ Polák SEP	e-mail / ~~telefon: 602~~ 160 703 polak@dekonta.cz
Název / Číslo zakázky: ~~Lovochemie - monitoring~~ - 127 113	Laboratorní číslo: (doplní laboratoř):

Datum a čas odběru vzorků:	18.11.2020
Vzorek odebral:	Martin Polák
Vzorek předal dne:	18.11.2020
Způsob a podmínky dopravy vzorku do laboratoře:	osobní ~~automobil - lednice~~
Způsob provedení analýz: (nehodící se škrtněte)	- požaduji akreditované stanovení - požaduji stanovení u jiné laboratoře (které): ~~Ústí~~ nad Labem..... - bez specifických požadavků na stanovení
Požadovaný termín dodání výsledků:	
Požadavek na archivaci vzorků po dobu:	

Označení vzorku	Popis vzorku / Matrice	Požadovaná stanovení	Poznámky
HV - 2	podzemní voda	~~CHSKcr,TOC,N anorg.,P celk.~~	2x 500 ml
HV - 4		~~CHSKcr,TOC,N anorg.,P celk.~~	2x 500 ml
HV - 6		~~CHSKcr,TOC,N anorg.,P celk.~~	2x 500 ml

Sampling safety

It is recommended to focus in the following areas:

- Organization responsibility
- Employee health and safety training
- Knowledge of fire protection principles
- Working with hazardous substances
- Personal protection
- Environment protection
- Decontamination
- Description of possible emergencies
- Principles of the protective equipment usage
- Principles of the first aid

Duties of the sampling group:

- Have the necessary entrance permits
- Meet the requirements of the contracting authority concerning safety and healthy protection (training, protective equipment, operating conditions, etc.)
- Check, before starting the work related to digging in the land (boreholes, probes, etc.), presence of underground structures (landowner and relevant network administrators), in particular:
- Gas distribution pipes
- Electrical cables
- Telecommunication networks
- Water supply and sewerage systems
- Production and heat lines

If the health and safety conditions are not secured, work must not start!

Quality assurance:

Quality assurance:

1. Clear tasking with exact technical specifications
2. Qualified and experienced staff
3. Appropriate and verified procedures - SOP
4. Suitable equipment, accessories and material
5. Suitable laboratories

Quality control:

- Control samples
- Control analyzes

Used methodologies and standards, related legal regulations

Methodology of the Ministry of the Environment "Quality assurance of remediation works ", 2000 (Project PPŽP 550/1/97) ČSN EN 25667-1 Guidelines for program design sampling ČSN EN 25667-2 Instructions for sampling methods samples ČSN ISO 5667-3 Guidelines for sample preservation and handling them ČSN ISO 5667-11 Sampling instructions groundwater

Practical Guide for Ground-water Sampling, Barcelona, Gibb ...ISWS, 1985
Low Flow Sampling, Puls, Barcelona, EPA


The End

Contact:

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