

VISIT REPORT

Visit program from 18.10-22.10.04 for NCHMEN/BG in Berlin

Participants from Bulgaria:

Dr. Galina Gopina	NCHMEN
Dr. Veska Kambourova	NCHMEN
Dr. Kosta Vasilev	NCHMEN

Participants from Germany:

Malin Ahlberg	Umweltbundesamt
Hans-Werner Althoff	Umweltbundesamt
Dipl.-Ing. Karin Brennecke	Berliner Wasserbetriebe (OWA Tegel)
Jelena Butter	Berliner Wasserbetriebe (Wassermuseum)
Prof. PD Dr. Hermann H. Dieter	Umweltbundesamt
Dr. Uwe Dünnbier	Berliner Wasserbetriebe (Jungfernheide)
Tatjana Ernst	student apprentice
Dr. Jutta Fastner	Umweltbundesamt
Dr. Gesche Grützmaker	Umweltbundesamt
Petra Hantsche	DNWAB
Michael Kempf	Berliner Wasserbetriebe (Ruhleben)
Dr. Peter Lepom	Umweltbundesamt
Dr.-Ing. Hans-Martin Mulisch	Umweltbüro Dipl.-Ing. Mulisch GmbH
Peter Schumann	Berliner Wasserbetriebe (Tegel)
Dr.-Ing. Burkhard Wricke	DVGW- Technologiezentrum Wasser

Monday, October 18th , 2004

1. Visitation of the Federal Environmental Agency, meeting point at Bismarckplatz 10:30 a.m. (Ahlberg)

The aim of the morning was to convey an impression to the guests of Bulgaria about the tasks and functions of the Federal Environmental Agency.

a. Visitation of the library (*library team*)

The library team guided the guests through the rooms of the library and informed about laws, regulations, administrative regulations of the laender and technical books. To receive further information in the internet, the library team explained the library catalogue to the guests.

Agreements

- On request the Bulgarian guests will get further information or literature by email (bibliothek@uba.de) or over the internet site of the Federal Environmental Agency (www.umweltbundesamt.de).
- Library catalogue: <http://www.umweltbundesamt.de/uba-info/d-fabib.htm>.

b. Inspection of the water laboratory of the Federal Environmental Agency (*Lepom*)

Lepom explained the tasks of the water laboratory und showed the different laboratories. The guests learned that the water laboratory is in use primarily for examination of surface water.

Agreements

- Further experience should be exchange between Bulgaria and Germany. It should be checked, whether the water laboratory of the Federal Environmental Agency can be used for the project. *Lepom* gives with pleasure further information about quality assurance in the laboratory area.

c. Presentation about the Federal Environmental Agency (*Dieter*)

- *Dieter* informed about the tasks and structure of the Federal Environmental Agency, particularly the drinking water department.

The Federal Environmental Agency is the largest scientific environment authority of the federation.

Tasks of the Federal Environmental Agency:

- Scientific work

The Agency works out scientific, technical, medical and social scientific basic knowledge as well as proposals for solution, which serve the Federal Ministry for the environment as basis for decisions.

- Analysis, description and assessment

- e.g. environmental label „Blue Angel“
- Inspection of methods
 - e.g. Classification of water endangered substances in endangering classes
- Collection of data
- Informing the public e.g. environmental perils
- Cooperation on legal regulations
- Cooperation on international projects

- Publications about chemical safety in the internet: www.blac-info.de

d. Presentation about the project progress in Bulgaria (*Kambourova*)

- Presentation of the progress report (cp. progress report).

e. Agreements

- In the after-meeting was decided, that in the context of WP5, at least 5 suspicious parameter should be measured in Bulgaria. *Mulisch* will suggest and justify the 5 parameters. It should be checked, whether the water laboratory can be used for the analytic. (*Dieter*)

**2. Visitation of the water works Ludwigsfelde, DNWAB,
Meeting point 3.30 p.m. (*Hantsche*)**

- The Bulgarian guests get information about the communal drinking water and sewage supply in Berlin.

Hantsche informed about the specific problems in the field of the water works Ludwigsfelde. These are primarily contaminations of the ground water as a result of the high industrial use in the past (e.g. airplane industry).

After the presentation the water works was inspected and *Hantsche* explained the modern ground water monitoring system. This system serves the prevention of supply failures and the optimisation of the water supply.

Agreements

Further exchange of experience regarding:

- Construction of a ground water monitoring system
- Processing techniques

Tuesday, October 19th 2004

Visit appointment at the Berliner Wasserbetriebe, meeting point in Tegel, 10:00 a.m.



1. Surface water- treatment plant (OWA) Tegel (Brennecke)

- *Brennecke* informed about the history of the drinking water supply in Berlin, the problems of the Tegeler lake due to the increased phosphate concentration in the past and she informed about the technical solution process in the surface water treatment plant Tegel. As a result of the irrigation fields and the discharge of the sewage plant Schönerlinde it got to an eutrophication of phosphate in the Tegeler lake. Strong alga growth was the result of the eutrophication. In the year 1985 a phosphate

concentration of 700 µg/l were measured and the lake was in bad condition. To improve the conditions the surface water treatment plant was built. The plant should reduce the phosphate inflow from the Nordgraben and the Tegeler Fließ. This led to a considerable improvement in the water quality with the time (phosphate concentration 2003: 80µg/l). The Tegler lake is due to the permanent processing in an ecologically stable condition.

- *Brennecke* showed the principle scheme of the surface water treatment plant. After that the plant was inspected.

The first step in the plant is the mechanical pre-purification by coarse and fine screen. After this the raw water is pumped into the distributor tower and micro flocculation is initiated by adding flocculants. Macro flocculation, assisted by adding flocculants aid, takes place in the pipe flocculation section after the distribution tower. The water then flows through sedimentations- and filter plants and a cascade to enrichment with air oxygen back into the Nordgraben. The sedimentation phosphate sludge is pumped out in the sewage plant Ruhleben.

(Cp.: http://www.bwb.de/deutsch/abwasser/owa/owa_tegel.html)



Inspection of the sedimentation tank

2. Water works incl. artificial groundwater recharge, meeting point Tegel, 12:00 a.m. (*Schumann*)

- *Schumann* introduced the overall plan of the water supply of Berlin. He also described the effects of the separation of the water supply between East and West Berlin after the division. After the presentation the water works was inspected, particularly the filter plants.

- Inspection of the infiltration area:

The Berliner Wasserbetriebe takes care about the enrichment of the ground water by an artificial infiltration of surface water. This is necessary to compensate for the ground water withdrawal. The percipitations and the bank filtration not suffices for this. After a mechanical treatment process by course screen and micro sieves, the lake water is pumped to the infiltration area.

- Cp.: www.bwb.de





Inspection of the infiltration area

**3. Labor Jungfernheide, Meeting point Jungfernheide, 3:00 p.m.
(Dünnbier)**

Dünnbier showed the different laboratories and informed about the analysis equipments for chemical and microbiological investigation of drinking water. After the laboratory inspection *Dünnbier* explained the modern computer system for registration of samples, examinations and results. These informations can be easily called about a search mask.

Agreements

Further exchange of experience by email regarding:

- Literature
- Analysis regulations
- Equipment producer

Wednesday, October 20th 2004

Visitation at the Berliner Wasserbetriebe

a. Irrigation fields (*Kempf*), meeting point Karolinenhöhe 9 a.m.

Kempf guided and informed the guests about the irrigation fields. Nowadays the irrigation fields only take the outflow from the sewage plant Ruhleben. (Limited operating license).

b. Visitation of the sewage plant Ruhleben (*Kempf*), meeting point Ruhleben 10:30 a.m.

- The aim of the visitation was to convey an impression of the problems and solutions of the wastewater treatment in Berlin. *Kempf* informed the guests about the history and the size of the sewage plant. The several stages of expansion and the technical data were represented. One problem for the water quality is the enrichment of mercury as a result of the slow exchange of the water balance.
- The sewage plant Ruhleben has a mechanical and a biological purification of wastewater. The first step is the mechanical pre-purification by screens, sand trap and preliminary sedimentation. Microorganisms remove floating substances, solved organic and solved inorganic substances from the wastewater in the biological treatment. At this process a biological phosphate elimination is also carried out. Since 1985 the sludge is drained and burned.

After the theoretical introduction the sewage plant was inspected.



Inspection of the sewage plant Ruhleben

**c. Water work museum, meeting point Friedrichshagen 2.45 p.m.
(Butter)**

- *Butter* guided the Bulgarian guests through the disused water works Friedrichshagen. The exhibition shows a cross-section of the history of Berlin's water supply and urban drainage from 1850 to 1950. The guests find out about the supply of the Berlin population by means of house and road wells and via wooden water pipes. The inadequate hygienic conditions in the city before the construction of the sewer were also depicted. *Butter* informed about the redevelopment following the end of the war and the separation of the water supply between East and West Berlin after the division of the city in 1949. In the machine hall the guests inspected three compound piston steam engines dated 1893. It wasn't until 1979 that steam operation was discontinued and the last engines with this drive mode in the Friedrichshagen waterworks were shut down.

- More information in the internet: www.museum-im-wasserwerk.de

Thursday, October 21st 2004

**DVGW – Technologiezentrum Wasser, Meeting point Dresden,
10:30 a.m. (Wricke)**

- Exchange of experience about nitrate concentration and manganese concentration in Germany and Bulgaria. *Wricke* informed the guests about technical solution to reduce nitrate and manganese. In the project *Wricke* is responsible for the cost calculation of technical solutions. Furthermore he informed about the possibility of contracts between agriculture and water management to reduce nitrogen fertilisation.

Agreements:

- *Wricke* will arrange further information about:
 - Examples of contracts between agriculture and water management
 - Essay of Mr. Kiefer about the technical nitrate removal
 - Examples of technologies for little plants to remove manganese and nitrate
 - List of specific costs of technologies
 - List for the cost comparison
 - Technisches Regelwerk, CD

Friday, October 22nd 2004

1. Test field, Federal Environmental Agency, meeting point Marienfelde, 10:00 a.m.

a. Visitation test field

- Tests are carried out in the area of bank filtration and river simulation. The test plant allows the simulation of aquatic lotic (flowing), lentic (stagnant) and flow-through systems. Through this substances or microorganisms can be examined of their effect on flora and fauna. *Grützmacher* guided the guests through the test plant.

Agreements

- Further exchange of experience and cooperation in bank filtration.

More information about the test field:

<http://www.umweltbundesamt.de/fsa/htm/fsa.htm>



Inspection of the test field Marienfelde

b. Technical renovation possibilities by iron-manganese reduction of ground water (*Althoff*)

Althoff informed about methods to reduce iron-manganese of ground water. *Althoff* advised the Fermanox[®]-water preparation process. As an underground preparation process part water is enriched with oxygen and is led back over well into the aquifer. Through this process iron and manganese oxidise to solid particles and fixed in the ground.

- *Althoff* gives with pleasure further information.

More information about iron-manganese reduction: www.fermanox.de .
Information about technical plants: www.dbta.tu-berlin.de .

2. Federal Environmental Agency, meeting point Corrensplatz (*Fastner*)

- *Fastner* informed about the Cyanobakteriatoxine Microcystin. At the advice showed, that Microcystin can be relevant in Bulgaria for the drinking water. A large part of the drinking water in Bulgaria is extract from surface water and in the summer months alga growth can be watched. *Fastner* explained, that most of algae are blue algae and these are as are rule toxic. Therefore it is reasonable to check the drinking water in the summer months.

Agreements

- Receipt of informative material (reference books, internet addresses), *Fastner* gives with pleasure further information about Microcystin.
- More information:
<http://www-cyanosite.bio.purdue.edu/index.html> and
http://www.who.int/docstore/water_sanitation_health/toxicyanobact/



Sightseeing: Checkpoint Charlie

Potsdam, November 5th, 2004

Tatjana Ernst