Dushanbe Water Supply Project Coordination Unit

Second Dushanbe Water Supply Project

ENVIRONMENT MANAGEMENT AND MONITORING PLAN (EMMP)

December 2010

Dushanbe, the Republic of Tajikistan
1. Foreword

This document – the Environment Management and Monitoring Plan (EMMP) is the fundamental for the Project activity, including rehabilitation (reconstruction) of the Dushanbe Water Supply System, which is provided in accordance with the World Bank requirements for environment evaluation described in OP/BP/GP 4.01, as well as with the legislations and standard acts of the Republic of Tajikistan on the environment expertise and influence assessment and is used as the best practice for the environment protection. The aim of EMMP is to determine the main effect on the environment, social field and people’s health as a result of the Project implementation continuance, suggestion of arrangements for reduction of significant negative impacts and establishment of a monitoring program.

The investment program in the Second Dushanbe Water Supply Project is financed from the funds of the World Bank International Development Association (IDA) and the Tajikistan Republic Government contribution. At the implementation of the EMMP the Project will not have a negative influence on environment and will not create a hazard to people’s health: thus the World Bank for the purposes of OP 4.01 awarded a category “B” to the Project. The Project gives significant benefits for the Environment and the people’s health, in particular, improvement of stable water supply sources through the cleaning the water supply system, reduction of water irrational use, decrease of energy consumption through the high effectiveness of functioning and improvement of the population’s health through the good quality of treated water.

The EMMP consists of 9 sections. After the Foreword Section 2 briefly describes the Project; the Section 3 provides the summary of the environment policy, legal and administrative frameworks on this issue; the Section 4 describes the baseline conditions/analysis; the Section 5 defines the Project’s impact; the Section 6 defines the mitigation measures; the Section 7 describes the measures for the EMMP implementation and monitoring; the Section 8 describes the costs for realization of EMMP and the Section 9 is dedicated to the EMMP disclosure and consultation. The summary of environment issues and the mitigation program is given in Table 1.

2. Prerequisites and interim Project implementation achievements.

The Dushanbe city is the capital of Tajikistan and has about 679,400 of population. In accordance with the investment policy of the urban infrastructure and the standards of the Former Soviet Union, as the capital of the independent republic, the Dushanbe city was provided with a water supply and sewerage system, the level of service outreach as per the official statistics was close to 90%. The investments and the current costs for the water supply services same as for other main service areas mostly were covered by subsidies of the central and other authorities. The tariffs were established based on social considerations and did not relate to the service costs, the effectiveness of which was much limited due to the inapplicable projects and extremely low quality of establishments and equipment. Upon acquisition of the independence of Tajikistan in 1991 the inter-republican budget payments have been suspended and the civil war in 1992 has ruined the economy of the country. And the costs for minimum operation and maintenance of the water supply and sewerage system via activity were too limited. The lack of necessary resources, in its turn, expedited the deterioration of physical state of water pumping facilities and the water distribution network. The influence of floods one by one in 1992, 1993, 1996 and 1998 also promoted extensive worsening. As a result the Dushanbe water supply
system became unsafe and ineffective. It is worth mentioning that the total output of water treated per capita in Dushanbe city amounts to about 1400 liter/day, which is 11 times more than in the Western Hemisphere. Approximately 60% are the losses of water produced due to the leakages through the damaged networks, sewerage sanitary devices and irrational water consumption.

Institutionally the performance of services for water supply and sewerage is the obligation of the Municipality of the Dushanbe city, which is the owner of the SUE “DushanbeVodokanal”. The SUE “DushanbeVodokanal” in point of financial and administrative view is considered as an independent enterprise of public sector, which principally operates on a commercial basis, but in the present time it is a debtor.

For the complete reconstruction of the water supply service level in a good manner is required an amount of more than 150 million US Dollar. Now this aim is far from the financial means of the SUE “DushanbeVodokanal”.

According to the above as per the Credit agreement signed between the Republic of Tajikistan and the World Bank International development Association dated July 03, 2002 and the subsequent Financing Agreement for Additional Financing in order to implement the Dushanbe Water Supply Project was allocated a credit in amount of 13.5 million XDR (on the date of signature is equivalent to 17 million US Dollar) and credit and grant in amount of 3.4 million XDR (on the date of signature 5 million US Dollars) correspondingly.

The proposed Second Dushanbe Water Supply Project with total funding equivalent to 12 million US dollars, will continue promoting the DVK to improve the water quality and water supply safety through: a) cleaning the water supply system; b) preparation and performance of the effective demand management program for reduction of abundant water consumption and demand; c) water quality improvement through the rehabilitation and renovation of the key elements in the treatment chain; e) financial, institutional and operational performance improvement of the SUE “DushanbeVodokanal”.

The total funds allocated for the project including the proposed grant for the repeater cover just 23% of the necessary investments for rehabilitation and reconstruction of the Dushanbe water supply system, in connection with this the proposed proceeds are intended to be applied to continue implementation of the primary tasks, where the immediate investment is required. The components of the proposed project include:

Component 1 (US$ 9.3 million of which financed by IDA US$8.7 million): Water system upgrades for improved quality, reliability and efficiency of service, including: (i) network cleaning, (ii) NAP pump station and reservoir rehabilitation, (iii) SAM filter rehabilitation, (iv) chlorination systems rehabilitation; (v) water quality monitoring units; (vi) bulk metering and pressure zoning;

Component 2 (US$ 16.8 million of which financed by IDA US$ 0.0 million): Demand management for higher commercial revenue and reduced water wastage, including: (i) installation of 165,000 residential and master meters; (ii) rehabilitation of plumbing in apartment buildings; (iii) rehabilitation of house connections.

Component 3 (US$ 2.7 million of which financed by IDA US$2.7 million): Capacity building for operational performance improvement, including (i) technical assistance to O&M; (ii) Consultancy for water master plan & hydraulic modeling, network information system, SCADA system and leak reduction strategy; (iii) TA for implementing NIS and hydro models; (iv) hardware and software; (v) training in energy efficiency; (vi) training for water quality monitoring; and (vii) TA for specialized O&M aspects.
Component 4 (US$ 1.4 million of which financed by IDA US$ 0.0 million): Capacity building for corporate development and financial performance improvement, including: (i) TA for corporate development and finance; (ii) Support accounting department; (iii) accounting and customer service/billing software; (iv) planning and budgeting of tariffs; (v) support billing and metering program; (vi) strengthen human resources functions; (vii) Customer relationship management.

Component 5 (US$ 2.2 million of which financing by IDA US$ 1.34 million): including (i) Engineering design and supervision of physical investments; (ii) PCU operating cost; (iii) Annual project audits.

3. Political-legal and administrative frameworks.

For regulation of the environment protection issues with regard to this project the main documents are the following laws, standards and norms:

- Law of the Republic of Tajikistan about the population’s health protection #419 dated 15.06.1997;
- Law of the Republic of Tajikistan on Ecological Expertise
- Law of the Republic of Tajikistan about the wastage and usage # 44 dated 10.05.2002;
- Law of the Republic of Tajikistan about protection of the ambient air No. 228 dated 01.02.1996;
- Water Code of the Republic of Tajikistan (2000);
- Land Code of the Republic of Tajikistan (1996);
- Provision about the state monitoring of environment protection (approved by the resolution of Council of Ministers # 21 dated 24.01.94);
- Relevant Construction standards and rules (SNiP), sections for the Environment protection.
- Provision of the subsoil usage licensing order of Tajikistan (resolution of the Government of the Republic of Tajikistan # 92 dated 04.03.2002);
- Provision of the underground water protection (1984)
- Resolution of the Government of Republic of Tajikistan about differentiation of authorizations of specific authorized state bodies for regulating of water usage and protection # 39 dated 04.02.02;
- Resolution of the Government of Tajikistan about the order of administrating the State water cadastre of the Republic of Tajikistan #193 date 30.04.2002;

Basic EA Laws. There are two laws in the country that stipulate all aspects of the EA: (a) Law on Nature Protection; and (b) Law on Ecological Expertise. The Chapter V, Articles 33-37 of the Law on Nature Protection (1993), introduces the concept of state ecological review (literally, state ecological “expertise” – SEE) which seeks to examine the compliance of proposed activities and projects with the requirements of environmental legislation and standards and ecological security of the society. The mentioned laws stipulate the mandatory cross-sectoral nature of SEE, which shall be scientifically justified, comprehensive, and objective and which shall lead to conclusions in accordance with the law. SEE precedes decision-making about activities that may have a negative impact on the environment. Financing of programs and projects is allowed only after a positive SEE finding, or conclusion, has been issued. The following activities and projects subject to state ecological review: a) draft state programs, pre-planning, pre-project, and design documentation for economic development; b) regional and
sectoral development programs; c) spatial and urban planning, development, and design; d) environmental programs and projects; e) construction and reconstruction of various types of facilities irrespective of their ownership; f) draft environmental quality standards and other normative, technology, and methodological documentation that regulates economic activities; g) existing enterprises and economic entities, etc. The laws stipulate that all types of economic and other activities shall be implemented in accordance with existing environmental standards and norms and shall have sufficient environmental protection and mitigation measures to prevent and avoid pollution and enhance environmental quality. The EA studies analyzing the short- and long-term environmental, genetic, economic, and demographic impacts and consequences shall be evaluated prior to making decisions on the sitting, construction, or reconstruction of facilities, irrespective of their ownership. If these requirements are violated, construction will be terminated until necessary improvements are made, as prescribed by the State Committee for the Environment Committee under the Government of the Republic of Tajikistan and/or other duly authorized control bodies, such as sanitary, geological, and public safety agencies.

The Environment Committee under the Government of the Republic of Tajikistan, Ministry of Melioration and Water Resources of the Republic of Tajikistan and the Chief Directorate for Geology under the Government of the Republic of Tajikistan “Glavgeologiya” are the specific authorized bodies of the Republic of Tajikistan in field of the natural environment protection and are competent for regulation of the SUE “DushanbeVodokanal” activity for the environment and therefore are responsible for provision of state expertise of actual aspects of the EMMP which are under their jurisdiction. Additional arrangements of the monitoring and supervision are provided for the day to day review as the part of Project implementation.

The Environment Committee under the Government of the Republic of Tajikistan looks after the state of water resource and the quality of sewerage.

The Ministry of Melioration and Water Resources of the Republic of Tajikistan:
- establishes within the allocated to the Ministry of Water Resources consumers’ water consumption limits, non-depending on their type of ownership, issuance of allowance for specific water consumption for irrigation, informing the Environment Committee under the Government of the Republic of Tajikistan about the summary data for water consumption and overflowing by the national economy fields;
- provides accounting of quality and quantity of the surface and underground water, development and issuance of state Water Cadastre;
- distributes the water resources by the national economy fields.

The Chief Directorate for Geology under the Government of the Republic of Tajikistan “Glavgeologiya” administrates the State Water cadastre on the underground water section. While administrating the State Water Cadastre on the underground water section the Chief Directorate for Geology under the Government of the Republic of Tajikistan “Glavgeologiya” carries out the following functions: analysis, systematization and storage of data on water objects and water consumers; relevant and prospective assessment of water and its quality and etc., with authorization to approve the regime of underground water wellfields and monitoring for usage and protection of underground water objects from exhaustion and pollution. The State Architecture and Construction Control Inspectorate (SACCI) of the Agency for Construction and Architecture under the Government of the Republic of Tajikistan controls the corresponding of the construction works provided with the existing construction standards and rules.

The Ministry of Health of the Republic of Tajikistan is a specific authorized body competent for regulation of the DVK activity. The Ministry and its structural division, in particular the State Sanitary Epidemiological Supervision Center, provides the state sanitary supervision of the
quality indicators of drinking water and sewerage in accordance with the relevant standards, sanitary rules and norms, as well as provides the state preventive sanitary supervision for the construction process and reconstruction of water supply objects according to the sanitary norms and rules.

For performance of excavation works (trenching) and other appropriate necessary repair and rehabilitation works it is necessary to get a special permission from the SACCI, Agency for Construction and Architecture under the Government of the Republic of Tajikistan and to agree with the management of the Central Heat Network Dushanbegorelectroset, Dushanbe Gas Economy Enterprise “Dushanbegas”, Ministry of Transport and Communication of the Republic of Tajikistan, State Motor Vehicle Inspectorate, Ministry of Internal Affairs of the RT.

While pipelining and testing new pipes as well as while its operation we would need to get a special allowance from the State Sanitary Epidemiological Center of Dushanbe City.

4. Fundamental Conditions.

The Dushanbe city territory is divided into four administrative-territorial districts:
- Ismoili Somini District surrounding the Northeast part of the city;
- Sino District surrounding the western and south-western part of the city;
- Firdavsi District surrounding the Southern part of the city;
- Shohmansur District surrounding the eastern and southeastern part of the city.

The existing water supply system of the city for its destination is jointed: Household-fire prevention-industrial; by the way of water supply – mixed (pressure-gravitational); by the water supply sources – mixed (using the surface and underground water). The water supply to apartment blocks and most of industrial enterprises is provided by the “Samotechnaya”, “Napornaya”, “Kafernigan” and “South-West” water pumping stations. The Samotechnaya and Napornaya stations use the water from the Varzob river, Kafernigan – underground water of the Kafernigan river, and the South-West – underground water of floodplain terrace of the Dushanbinka river.

Samotechnaya Water Treatment Plant (SAM WTP); is located in the northern part of the city on the level of 930-940 m. The diversion flow is provided from the derivation channel of the Varzob hydroelectric power stations, through the sedimentation pond by siphon pipelines. The station supplies the water to the Northern part (Ismoili Somoni District) and central parts (Part of the Sino District) of the city up to the level of 840 m.

Napornaya Water Treatment Plant (NAP WTP); is located southward of the SAM WTP, diversion is provided from the derivation channel of the Varzob hydroelectric power station. The water from this station is supplied to the central part of the city (Ismoili Somoni District) with interval in height of 850…890 m. and to the right bank of the city (small part of the Sino District).

South-West Wellfield (SWW); the station is located at a distance of 0.2 km from the south-west border of the city, within the plain territory at a level of 740-750 m. South-west wellfield supplies water to the Firdavsi and Sino Districts.

Kafernigan wellfield (KAF); the area of the wellfield is located in the high water bed of the Kafernigan river on the right bank of it, at a distance of 0.6 km from the south borders of the
city. The height position is characterized by the level of 773-783 m. The station supplies water to the eastern (Shohmansur District) and south districts of the city up to the level of 850 m.

The location of water treatment plants and wellfields is given on the diagrammatic plan in the Attachment 1.

The water supply and distribution system has a long length consisting of about 690 kilometers (including conduits – 174 km., main line – 297 km., distribution network – 220 km) and mainly consists of steel (60%), iron cast (35.5%) pipelines and a little number of asbestos (1%) and plastic (3.5%) pipes.

The sanitary conditions in Dushanbe are not so satisfactory even in comparison with the regional level. The water supply system is characterized by high production and insufficient water treatment, much leakage, irrational water use.

5. Identification of impacts.

Possible potential impacts include:

- Improvement of the population’s health: The project increases the reliability of water supply service provision to domestic customers and will noticeably improve the quality of drinking water supplied to the population (particularly in physical and microbiological indicators), which lead to reduction of sickness rate related to water and will improve the population’s health.
- Effect on the water resource quality: The project decreases the amount of source water taken from the Varzob river and increases the effectiveness of the water treatment plant, makes the parameters of the treated sewerage closer to the standard level, which were taken into account for the Water Treatment Plant. This in its turn excludes the further worsening of the existing river water quality downstream (from the city). The project has no opposite effect on the river water quality formed upstream in Dushanbe city and its outskirts.
- Effect on stream and level of the underground water: The Project has no opposite influence on general regime and the level of underground water, as the underground water wellfield will not be extended.
- Removal of sediment of treated and disinfected water: Sediments created in sedimentation facilities at the treatment of source water and sewerage are the potential sources of soil and water pollution. The appropriate procedures of removal and utilization of sediments will be stipulated and maintained.
- Security of disinfection process: chlorinated reagents are the source of danger to people’s health. The reagents used for water disinfection will be the object of standard measures for protection and control of its content in the water.
- Pollution with building refuse: A negative influence on the underground water may obviously be temporal and insignificant. Construction works will be provided within the short term and normally the dry weather conditions in the Dushanbe city will promote the limitation of negative influence. Additional measures will be implemented and local standards for protection of the underground water from pollution will be taken into account.
- Temporal discomforts during the performance of the repair and rehabilitation works: These discomforts and impact will take place during the repair and rehabilitation works on the main water pipeline networks and other water distribution network, usually for a short term and will influence on different people in different time. The negative impact
include: the dust from construction works, noise while trenching, and possible effect of vibration on the old buildings, prohibition of entrance to buildings, closing of roads and their sites and traffic barrier, and moving of the construction works. The inhabitants of streets where the repair and rehabilitation works are provided will suffer these impacts for some short time. The effect will also be temperate for people using or crossing these places. For the mitigation of temporal discomforts appropriate measures stipulated and construction skills applied.

- Removal of the construction waste: The construction waste will arise during the repair and rehabilitation works in the facilities, in the main water pipelines and water distribution networks. These impacts will be localized and minimized through the corresponding procedures of removal and placement upon mandatory reception of permission from the Dushanbe Environment Protection Department for placement of the construction waste.

- Damage of the existing communal sites: old water pipeline networks, transmission equipment and telephone lines can be damaged while provision of the repair and rehabilitation works. During the construction there will be necessary measures undertaken including coordination and permission of the appropriate state bodies and enterprises of urban municipal economy listed in the Section 3.

- Labor security at the construction works: No danger is expected while the construction of the sites stipulated in the Project, as there will be applied the appropriate construction skills and safe conditions of work in accordance with the existing construction norms, rules and regulations.

- Leakage of POL during the construction: The usage of fuel and lubricants will be minimal at such a low scope of work on this site, and therefore the negative potential effect is insignificant. However the right construction skills shall be insured in order not to allow the water pollution.

- Damage of trees and plants: Effect on the green plantations will be short, local and will relate to the construction. The impacts can be mitigated by undertaking necessary measures stipulated by the conditions of Contract with the Contractor.

- Damage of cultural sites: As the works include the rehabilitation of the existing systems, where the unearthing took place earlier, no damage will be made on the archeological and other cultural values during the Project implementation.

6. Measures to mitigate environmental impact.

The necessary mitigation measures for this project are standard and widely applied in the construction practice. During the Project implementation the environment protection authorities can request for special plans of environment management, if the separate project components warrant developing such plans (for the sites costing more than 500,000 US Dollar or by particularities of workload determined by the Project Coordination Unit (PCU) or the Environment Protection authorities). Preparation of such specific mitigation plans is included in the scope of work of the Consultant for preparation of detailed design and bidding documents. Further mitigation measures in case of necessity shall be accepted and applied in the Project:

6.1 Preventive Measure Program for discomforts arose during the construction.

No doubt here will take place the short discomforts and traffic barrier. In order to avoid the discomforts the construction program shall include in the Contract with the Contractor the following new provisions:

- Definition of the water pipelines rehabilitation work performance consequence in order to decrease the discomfort up to a maximum low level.
- Definition of coordinating measures for decrease of water supply delays with the purpose of decrease of delay up to a minimum.
- Establishment of special methods of construction in densely populated settlements, decrease of discomforts related to the trenching up to a minimum, dismantling of temporal catwalks. Appropriate comforts for the day to day work will be warranted by possible methods to the limit.
- Requirements to the Contractor about approval of construction phases and negotiation of sites.
- Requirements to the Contractor about usage of the established route for performance of works. Shall be insured the traffic security, security signs to be established and the traffic lights shall operate according to the traffic rules. Safe by-passes and foot-paths shall be determined in appropriate manner.


Through the regime and specific limit of noisy operations (works) during the construction it is somehow possible to reduce the noise. Excavation and works related to it shall not be performed in residential area at night time. The daily control of the whole equipment operation applied in construction and transport shall insure the allowable noise. During the construction on all the construction sites the overvibration from heavy machines and mechanisms will be maximally reduced in order to reduce the damage to the surrounding area. The benching earthwork will be provided in exceptional cases. If the construction standards and rules stipulate more strict measures they will be applied.

6.3. Protection of air from the construction dust and pollution

The Contractor will apply measures for air cleaning from the dust while the process of construction and materials transportation, for instance, periodical water splashing in some sites, removal of unnecessary materials from the construction areas. All streets, pavements and construction areas shall be cleaned up upon the completion of construction works.

In order to reduce the vehicle waste the Contractor shall use the by-passes. This will even require the control of the whole equipment operation used while construction and transportation of materials, as well as usage of equipment if needed only.

6.4. Removal of unnecessary materials formed while the provision of excavation works.

The construction norms and rules relevant in the republic of Tajikistan require the undertaking of necessary measures for cleaning of construction areas from unnecessary materials and construction waste. These materials shall be removed from the construction site and placed in established zones. The junk materials will be warehoused in the appropriate places and protected from corrosion.

6.5. Removal of silt and sludge formed after the water treatment.

There are some relevant construction standards and rules (MKS ChT – 40.01-2008) which require undertaking of special measures for collection and utilization of sediment from the water treatment stations. For these purposes will be used the special drawn places, previously approved by the authorized bodies. The sediment will never be drawn into permeable soils, close to the surface water and buildings.

6.6. Prevention of pollution of underground water while the provision of the construction works.
The construction standards and rules acting on the territory of the Republic of Tajikistan stipulate the undertaking of measures for protection of the underground water from the construction waste. On the construction sites is controlled the collection of moderate amount of wastes and the drainage control is being provided. In order to prevent the development of erosion all the damaged plantation shall be transplanted and all the formed pits and trenches shall be brought to original state. Negative impacts on the underground water will be temporal and insignificant.

6.7. Prevention of chlorine leakage and reduction of its influence.

For prevention of potentially serious hazards to the chlorination operators’ health the liquid chlorine systems shall operate under the vacuum for prevention of leakages, and the chlorinators shall be produced from the materials having capacity to stand the corrosion effect of chlorine and the chlorine meter shall be installed inside the chlorination unit. There are the protection and emergency equipment stipulated in the chlorination units.


The Contractors shall take all necessary precautions in all fields of construction works, in particular, in the residence places and heavy traffic. The precautions will be directed to protection of labor and the constructors’ health. The public access to the construction sites shall be limited. The international experience applied and relevant rules shall assist in recovery of health and security insurance.

6.9. Control of fuels and lubricants (POL).

All the overground tankages shall be kept in impervious beds, the tankage capacity shall be of 110% of the amount stored. Necessary measures for prevention of POL leakages shall be taken during the operation of equipment. The POL leakage on the ground and sewerage is forbidden. Relevant requirements for the environment protection shall be strictly followed.

6.10. Restoring of plantations.

As a mandatory condition, all the damaged vegetation/flora shall be restored. Ornamental trees to be cut shall be also restored.

6.11. Additional special measures.

All the wood necessary for the usage during the construction shall be purchased from officially allowed places. All wastes (except for the construction wastes) such as wood, paper, glass, plastic and others shall be gathered, graded, warehoused and placed in the places agreed with the Environment Protection Department of Dushanbe City. All the construction sites shall be kept clean and maintained with good sanitary conditions.

7. Implementation and Monitoring.

The EMMP will be implemented by the SUE “DushanbeVodokanal” with the PCU assistance through the Contract with Consultant. The EMMP provisions and Environment protection standards relevant in the Republic of Tajikistan will be included in the Contract content.
The Environment Committee under the Government of the Republic of Tajikistan, Bodies of the State Sanitary Service of the Ministry of Health of the Republic of Tajikistan, Ministry of Melioration and Water Resources and the Chief Directorate for Geology “Glavgeologiya” under the Government of Tajikistan will bear responsibility for compulsion on using the relevant local standards and rules stated in the Section 3. General observation of the EMMP accordance with the works performed will be provided by the PCU water supply expert. This job is a part of his functional duties.

All the contracts of minor construction works will include the requirements for performance of special measures stipulated by the present EMMP provisions and international specifications. Daily supervision and observation of the construction works is a part of the Consultant’s obligations.

Through the usage of new laboratory equipment funded by the Project the water quality indicators will be controlled according to international and local standards. The water quality will be one of the key parameters in the Contract performance.

8. **Expenditures for implementation of the EMMP.**

As specified in the Section 5 the positive effect of the Project on environment has a significant and important sense.

Expenses (costs) for the mitigation measures are made by the Contractors, who introduce the stipulated mitigation conditions as an integral part of their Contract. These conditions include applying good construction experience and are included in the cost estimates and Contract price of the construction works performance.

The general monitoring costs, operational security and the environment plan and legal assistance are stipulated as the PCU operational costs.

9. **EMMP Disclosure and Consultations**

This is the basic principle and the most applicable method of environment management during the Project implementation, which requires a necessity in inter-agency coordination, training, public recognition, high quality of facility construction, monitoring and such a management is generally recognized. The social survey which was provided during the preparatory works under the project has confirmed this point of view. The Project Coordination Unit (PCU) will continue cooperating with the investors, interested public groups and governmental organizations.

A public consultation and disclosure campaign of the EMMP was prepared, organized and carried out. The EMMP was publicly disclosed on the official site of the Dushanbe Municipality and is available at [http://www.dushanbe.tj/ru](http://www.dushanbe.tj/ru) in English and Russian languages. EMMP public consultations were carried out on January 14, 2011 and gave an opportunity for the community to comment and provide suggestions to the EMMP. Official announcement of the consultations and invitation to participate were published in the local newspapers and on the website prior to consultations. The Minutes of the Consultations are attached to the EMMP as Annex 1.
Table 1. Environment Management and Monitoring Plan.

<table>
<thead>
<tr>
<th>Component and activity</th>
<th>Possible negative effect or dampness</th>
<th>Mitigation opportunities</th>
<th>Responsible party for the mitigation</th>
<th>Requirements for monitoring</th>
<th>Responsible for monitoring and follow up with enactments of the Republic of Tajikistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Construction</td>
<td>Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recovery of capacity for water production and water distribution network</td>
<td>Soil and water pollution by sediment after the water treatment</td>
<td>Using the agreed proper placement sites; observe the standards of Tajikistan</td>
<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU</td>
<td>Periodical inspection of the unit rehabilitation activity</td>
<td>DVK, PCU, Environment Protection Department of Dushanbe City, Ministry of Melioration and Water Resources</td>
</tr>
<tr>
<td></td>
<td>Pollution of underground water by construction wastes</td>
<td>Taking of measures for maintenance of moderate wastes and drainage control</td>
<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU, Contractors</td>
<td>Periodical supervision of construction works</td>
<td>DVK, PCU, Department of Environment Protection of Dushanbe City, Glavgeologiya;</td>
</tr>
<tr>
<td></td>
<td>Pollution of soil and water from improper placement of construction waste</td>
<td>Usage of agreed placement sites only; immediate removal of wastes; proper storage and protection of salvage; collection, sorting and proper placement of wastes; observe the Tajikistan standards</td>
<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU, Contractors</td>
<td>Periodical supervision of construction works</td>
<td>DVK, PCU, Department of Environment Protection of Dushanbe City, Ministry of Melioration and Water Resources</td>
</tr>
</tbody>
</table>

**Component**

**Possible negative influence or significance**

**Result**

**Responsible party for the mitigation**

**Requirements for monitoring**

**Responsible for monitoring and follow up with enactments of the Republic of Tajikistan**
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Responsible Party</th>
<th>Action</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damages of trees and plant layer</td>
<td>Transplantation of all damaged plantation; use the official wood sources only</td>
<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU, Contractors of minor construction works</td>
<td>Periodical review of construction works and monitoring of the wood sources</td>
<td>DVK, PCU, Department of Environment Protection of Dushanbe City</td>
</tr>
<tr>
<td>Social-economic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disturbance caused by noise and vibration to the population while the performance of works</td>
<td>Establish a regime and other specific limits; if possible to limit the works at night time; development of equipment for supervision of noise; and proper care; limit for unnecessary vibration in the construction areas; observe local standards</td>
<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU, Contractors</td>
<td>Periodical check of construction works</td>
<td>DVK, PCU, Department of Environment Protection of Dushanbe City State Architecture and Construction Control Inspectorate</td>
</tr>
<tr>
<td>Dusting</td>
<td>Measures for reduction of dust; water splashing; removal of residual materials; cleaning of the construction sites after completion of works</td>
<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU, Contractors</td>
<td>Periodical check of construction works</td>
<td>DVK, PCU, Department of Environment Protection of Dushanbe City State Architecture and Construction Control Inspectorate</td>
</tr>
<tr>
<td>Access limits to footpaths and vehicle, to the work performance sites</td>
<td>Establishment of consequent work and methods (flooring on trenches and gravestones, establishment of nameplates) for reduce of undesirable access; provide safe access; equipment for by-passes and pavements</td>
<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU, Contractors</td>
<td>Periodical check of construction works</td>
<td>DVK, PCU, Department of Environment Protection of Dushanbe City State Architecture and Construction Control Inspectorate</td>
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<td>Temporal delay in water supply</td>
<td>Establishment of coordination for turn off procedures; reduction of time for replacement operations; to use night schedule if need</td>
<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU</td>
<td>Observe of turn off coordination</td>
<td>Dushanbe Municipality, DVK, PCU, Dushanbe Center of State Sanitary Epidemiological Service</td>
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<tr>
<td>B. Operation</td>
<td>Environment</td>
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<td><strong>Operation of recovery capacity for water production</strong></td>
<td><strong>Pollution of soil and water by the product (sediment) of water treatment</strong></td>
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<td>Increase of traffic discomforts (emissions, bottle-necks, traffic congestions)</td>
<td>Usage of traffic ways; insurance of coordination with local authorities; permanent control and care of equipment</td>
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<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU, Contractors</td>
<td>Periodical check, observe coordination of traffic ways</td>
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<td>DVK, PCU, Department of Environment Protection of Dushanbe City, State Motor Vehicle Inspectorate</td>
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<td><strong>Hazard to the workers’ security, transport during the construction</strong></td>
<td>Make sure that all the precautions are strictly followed; limit the access to construction areas; implementation of traffic security plan; insure the safety of the workers’ equipment; observe local rules</td>
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<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU, Contractors</td>
<td>Periodical check of construction works; observe the security plans</td>
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<td>DVK, PCU, State Architecture and Construction Control Inspectorate</td>
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<td><strong>Pollution with waste, construction wastes, sediments of lubricants and oil and damage of plantation</strong></td>
<td>Basic proper construction norms and standards applied while the construction</td>
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<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU, Contractors of minor construction works</td>
<td>Periodical check</td>
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<td>DVK, PCU, Department of Environment Protection of Dushanbe City, Ministry of Melioration and Water Resources</td>
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<td><strong>Operation of the leakage detection program</strong></td>
<td><strong>Establish vacuum-operating and corrosion-resistant systems; establish the chlorine leakage control; requirement of replicating protection</strong></td>
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<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU</td>
<td>Periodical check</td>
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<td>DVK, PCU, Department of Environment Protection of Dushanbe City, Dushanbe Center of State Sanitary Epidemiological Service</td>
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<td>Implementation of the leakage detection program</td>
<td>Noise, vibration, limited access, traffic discomfort, water supply delay and hazard to the workers’ security, pavements and traffic</td>
<td>Basic proper construction norms and standards applied while the construction</td>
<td>Consultant, SUE “DushanbeVodokanal”, Dushanbe Water Supply PCU, Contractors</td>
<td>Periodical check of State Sanitary Epidemiological ServiceDVK, PCU, Department of Environment Protection of Dushanbe City, Dushanbe Center of State Sanitary Epidemiological Service, State Motor Vehicle Inspectorate, State Architecture and Construction Control Inspectorate</td>
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MINUTES OF THE CONSULTATIONS

Environmental management and monitoring plan (EMMP)
Second Dushanbe Water Supply Project

January 14, 2011         Dushanbe

Attended by:

1. Mirzoyev K. First Deputy of the Managing Director / Chief Engineer
   SUE "Dushanbevodokanal"
2. Kadamov M. Representative of the Environmental Protection Committee under
   the Government of the Republic of Tajikistan.
3. Aslitdinov N. Representative of the Public Information Center.
4. Partoev K. Representative of the NGO “Hamkori ba hotiri fardo”.
5. Takhirov R. Representative of the NGO “Youth of the New Century”.
6. Ikromov B. Representative of the State Sanitary and Epidemiological
   Surveillance, Dushanbe.
7. Kabutov K. Representative of the NGO "Oftob”.
8. Ahmedov A. Head of Hydrogeology of the Main Department of Geology under
   the Government of the Republic of Tajikistan
9. Davlyatmirov D. Head of Water Supply and Sanitation Department. Tajik Technical
   University.
10. Normatov A. Associate Professor of Water Supply and Sanitation Department.
    Tajik Technical University.
11. Boboyev L. Representative of the NGO "Foundation to support civil
    initiatives"
12. Hushvahtov M. Director PMU Dushanbe Water Supply Project, financed by the IDB.
13. Alimov S. Chairman of the Teenager’s Association “Aurora”.
14. Fatrelaeva L. Deputy Director of the NGO “Rennesans”
15. Shukurov I Representative of the Management of Environmental
    Protection of Dushanbe.
16. Nozim Z. Director of Dushanbe Water Supply Project Coordination Unit
17. Rustamov K. Assistant to the Director of Director of DWSPCU
18. Primkulov D. Chief Specialist on Water Supply, DWSPCU.
19. Muzaffarov H. Chief Specialist on Water Supply, DWSPCU.
20. Khasanov A. Chief Procurement Specialist, DWSPCU.
21. Zahirov A. Procurement Specialist, DWSPCU.
22. Burkhanova M. Translator, DWSPCU.

AGENDA:

Discussion on the Environmental Management and Monitoring plan (EMMP)
Second Dushanbe Water Supply Project

STATED:
Nozimov Z. A. Introduced attendants and read the agenda of the “Discussion of the Environmental Management and Monitoring Plan” (EMMP) for the second Dushanbe Water Supply Project. Further, Mr. Nozimov noted that the first Dushanbe Water Supply Project is financing by the International Development Association of the World Bank (IDA) with participation of the Government of the Republic of Tajikistan. The total amount of the first main IDA Project of the World Bank is 13.5 million SDR (Special Drawing Rights), which at the date of signing was 17 million USD. With the view of the implementation of additional events of the first Project by the request of Government of Republic of Tajikistan, the World Bank has allocated an additional financing in the amount of 3.4 million SDR (5 million USD). The completion of all activities under the first phase of Dushanbe Water Supply Project is fixed on June 30, 2011.

On October 25, 2010 the Management of the World Bank approved a Concept Note Document for the Second Dushanbe Water Supply Project in the amount of 12 million USD of grant assets. The scope of this funding will be approved by the Board of Directors of the World Bank not later than June 30, 2011. In addition, there is the perspective of providing parallel financing for the Second Dushanbe Water Supply Project by the European Bank for Reconstruction and Development and other donors, the size of which will be determined precisely as the project prepared. The Government of the Republic of Tajikistan will also provide co-financing. Following-up policies and procedures of the World Bank an updated environmental management and monitoring plan for the second Dushanbe Water Supply Project was prepared, which was sent to you for review. EMMP was also published in the official website of Dushanbe for public information.

The original version of EMMP was published in August 2000 and updated in September 2006. The Second Dushanbe Water Supply Project is focused on work implementation similar to the first Project. Therefore, the first EMMP provisions are also applied to the actions of the second Project. Chief Project Engineer Primkulov Dilshod Nuritdinovich will tell in details about program components for further development of water supply in Dushanbe determined for IDA financing of under DWSP-2, as well as provisions and sections of the EMMP for the second Project.

Primkulov D. provided information on Dushanbe Water Supply Project and the importance of EMMP during implementation of the current project. Prior to the implementation of the first Project the initial draft of EMMP was developed in 2000. EMMP was reviewed and agreed with all concerned agencies and civic organizations. Upon detailed review, amendments and changes to the EMMP, the final version was approved by the World Bank. Actual implementation of Dushanbe Water Supply Project started in 2002. With the view of the operational Project management the International Operator (MVV / Hydroplane, German Company) was hired. A service contract was signed with Operator. According to the service contract the Operator was required to provide services under the plan of renovation and rehabilitation of fund. Services included the following types of work: improvement of drinking water quality, sanitary protection, reconstruction of water supply distribution networks, water meters installation, replacement of pumps and electrical equipment, procurement of machinery and consumables, as well as the institutional reorganization of DVK, introduction of International Accounting Standards (IAS), computer customer service, improvement of financial status and tariff policy. During the operator's activities from 2002 to 2006, 62 major contracts were implemented. Primkulov D.N. characterized some contracts relating to construction works, and noted that supervision of the contractors for followinf-up the rules of environmental protection in accordance with EMMP was carried out by representatives of the City Committee for Environmental Protection, Operator, SUE "Dushanbevodokanal” and Dushanbe Water Supply PCU.

In September 2006, in connection with additional financing of the Dushanbe Water Supply Project a new updated version of EMMP has been prepared. EMMP was shared to all interested
organizations and a number of NGOs. A round table discussion on EMMP has been also conducted. With the implementation of contracts of additional funding all EMMP items were strictly followed-up, which were obligatory for contractors, the EMMP was attached to the contracts and constitute theirs integral part. Then Primkulov D. read the main EMMP provisions, updated for the second Dushanbe Water Supply Project, i.e. implementation methods and management control.

Then NGOs representatives asked questions on various subjects regarding current Project achievements and further actions under additional financing.

**Kabutov K.** It is not clear what does the title of document EMMP convey. Environment Management and Monitoring Plan should include monitoring indicators, which facilitate supervision of its implementation. In order to keep study permanent and completely survey of the questions and issues it would be good to keep regularly meetings on these issues.

**Asliitdinov N.** In addition to the above said I want the management of the project to pay attention to the necessity of conduction permanent public awareness program on the project implementation progress and its feedback.

**Alimova S.** In the further stages of the project implementation it would be good to take into consideration opinion of the local population on the achieved progress of the project; In this regard I suggest to keep social survey of the population attracting to this assignment NGOs like ours. We have sufficient experience for implementation of similar tasks.

**Takhirov R.** I would like to note importance of the measures on improvement of water quality improvement, and at the same time want to pay attention to the necessity of conduction of public awareness on rational use, careful and economical consumption of drinking water. To develop this direction it would be helpful for you to have your internet blogs for public awareness and feedback. We can accordingly assist you in this.

**Davlatmirov D.** I want to note urgency of the measures on improvement of water supply and its reliability. I can say with satisfaction that Dushanbe water supply project has reached significant results on rehabilitation of water supply system upon completion of the first phase of the project.

**Normatov A.** The title of the document EMMP clearly reflects and corresponds its content. To my opinion EMMP embraces all the events related to protection of the nature, and observance of the EMMP in further implementation of the project remains required.

**Khasanov A.** In order to know the water customers view on the achievements of the first Dushanbe water supply project, referring to the recommendations of the World Bank, we have published request for expression of interest in the local newspaper “Asia-Plus” on January 10, 2011 for hiring a consultant on conduction of social survey and customer analysis. Taking the opportunity, Khasanov referred to the participants, NGOs and social organizations inviting them to take part in this assignment. He also noted, that Environment Management Monitoring Plan includes main events for the second Dushanbe water supply project. Monitoring and assessment indicators of the project implementation will be included into the Project Appraisal Document.

**Akhmedov A.** Currently the significant part of drinking water produced from underground water of South West and Kafernigan intake treatment plant. I want to note on full capacity load of gathered water in these intake plants and its impossible to have gather additional water there. It is necessary to take into regard this factor in regard during implementation of the second project.
Primkulov D. According to capacity standards of these plants it is not required to increase their capacity. Besides, the second Project is aimed on decrease of water loss what will let us to reduce the volume of produced water.

Decision:

The participants of the disclosure meeting after comprehensive discussion approved the Environment Management Monitoring Plan and noted on importance of implementation of all its events and details during the Second Dushanbe water supply project in framework of additional financing, defining precise requirements on supervision and issues on Environment protection, particularly in during conduction of civil works and utilization of reconstructed buildings.

Corresponding attention to the implementation of EMMP should be stressed by the local stakeholders, contractors/suppliers being in charge for construction and rehabilitation works.

Minutes recorded by: Khasanov A. __________

Presided by: Nozimov Z. __________