Environmental Management Plan

Loan 2860 (SF)
Updated in July 2015

ARM: Water Supply and Sanitation Sector Project – Additional Financing

Improvement of Water Supply Systems in Noyemberyan Town and Berdavan

Prepared by the Armenian Water and Sewerage Closed Joint Stock Company (AWSC) for the Asian Development Bank.

STATE COMMITTEE OF WATER SYSTEM UNDER THE RA MINISTRY OF TERRITORIAL ADMINISTRATION AND EMERGENCY SITUATIONS;"ARMWATERSEWERAGE" CJSC

ASIAN DEVELOPMENT BANK FUNDED

WATER SUPPLY AND SANITATION SECTOR PROJECT - ADDITIONAL FINANCING

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Subproject V **IMPROVEMENT OF TAVUSH REGION WATER SUPPLY SYSTEMS**

L2860-ICB-1-05/1 **IMPROVEMENT OF WATER SUPPLY SYSTEMS IN NOYEMBERYAN TOWN AND BERDAVAN**

ENVIRONMENTAL MANAGEMENT PLAN
UPDATED VERSION

Yerevan,
July, 2015

JINJ Ltd

ASIAN DEVELOPMENT BANK FUNDED

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Subproject V	**IMPROVEMENT OF TAVUSH REGION WATER SUPPLY SYSTEMS**
L2860-ICB-1-05/1	**IMPROVEMENT OF WATER SUPPLY SYSTEMS IN NOYEMBERYAN TOWN**
Book V.1.3	**ENVIRONMENTAL MANAGEMENT PLAN**

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Yerevan,
July, 2015

Subproject V **IMPROVEMENT OF TAVUSH REGION WATER SUPPLY SYSTEMS**

L2860-ICB-1-05/1 **IMPROVEMENT OF WATER SUPPLY SYSTEMS IN NOYEMBERYAN TOWN AND BERDAVAN VILLAGE**

COVER OF THE DETAILED DESIGN

Book V.1.1 - General provisions and explanatory part

Book V.1.2 - Technical specifications

Book V.1.3 - Environmental management plan

Book V.1.4 - Working drawings

Book V.1.5 - Bill of quantities

Book V.1.6 - Cost estimates

TABLE OF CONTENTS

1. BACKGROUND OF THE PROJECT 6
2. ENVIRONMENTAL AND SOCIAL SAFEGUARD DOCUMENTS 6
3. INTRODUCTION 6
4. SCOPE OF WORKS 7
4.1 Description of existing water supply systems 7
4.2 Description of proposed rehabilitation works 8
5. BASELINE ENVIRONMENTAL CONDITIONS 10
5.1 Geographic location and climate of Noyemberyan town 10
5.2 Geographic location and climate of Berdavan village 10
5.3 Biodiversity 10
6. ENVIRONMENTAL AND SOCIAL IMPACTS 11
7. ENVIRONMENTAL IMPACT MITIGATION MEASURES 12
8. INSTITUTIONAL FRAMEWORK OF ENVIRONMENTAL MANAGEMENT 14
9. ENVIRONMENTAL CONSULTATIONS 15
APPENDIX 1: ENVIRONMENTAL MANAGEMENT MATRIX 20
APPENDIX 2: SITE SPECIFIC ENVIRONMANTAL MANAGEMENT PLAN 22
APPENDIX 3: FIELD VISITS CHECKLIST 24
APPENDIX 4: COMPLAINTS LOG 27
APPENDIX 5: UNANTICIPATED IMPACT / SIGNIFICANT INCIDENT / ACCIDENT NOTICE 28
APPENDIX 6: EMISSIONS / AMBIENT MONITORING FORM 29
APPENDIX 7: SUBPROJECT LAYOUT 30
APPENDIX 8. ENVIRONMENTAL CONSULTATIONS, LIST OF PARTICIPANTS 32

LIST OF ABBREVIATIONS

AWSC ADB PMU	Armenian Water and Sewage Company/ Project Management Unit of Asian Development Bank
DD	Detailed Design
DRR	Daily Regulating Reservoir
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
IEE	Initial Environmental Examination
JV	Joint Venture
LSGB	Local Self-Governmental Bodies
RA	Republic of Armenia
RA MoC	RA Ministry of Culture
RA MoH	RA Ministry of Healthcare
RA MoNP	RA Ministry of Nature Protection
RA MoT&C	RA Ministry of Transport and Communication
SSEMP	Site Specific EMP
WSS	Water Supply and Sanitation
W&W Systems	Water and Wastewater Systems

1. BACKGROUND OF THE PROJECT

Project implementation for the improvement of W&W systems will improve public health and environment for about 400,000 people (households and other consumers) are living in 18 towns and up to 92 villages through providing safe, reliable and sustainable water supply. The outcome of the Project is improved access to safe, reliable, and sustainable WSS services managed on commercial principles and environmentally sound practices.

The Project will also support poverty reduction by (i) reducing the incidence of waterborne diseases and costs of medical care; (ii) improving the time poverty of women due to labor intensive housework such as water collection, which may allow them to participate more in social and economic activities; (iii) providing safer and more reliable water supply; and (iv) improving the quality of life of the households in all the project towns and villages by improving their access to safe and sustainable drinking water.

Similar to the original W&W first project, the additional financing project also will fund two project components which include: (i) municipal infrastructure rehabilitation and improvement; and (ii) management improvement and development which include gender features.

2. ENVIRONMENTAL AND SOCIAL SAFEGUARD DOCUMENTS

In accordance with the ADB Environmental policy (2002) the Subproject is ranked to B category which does not need extended EIA. According to the RA law on “Environmental Impact Assessment and Expertise” (issued on June 21, 2014) this design documentation, which summarizes the types of activities planned under the sub-project, is not subject to environmental impact assessment and expertise, based on the insignificant impact of the planned activity on the environment.

As a B Category Project ADB Policy required development of Initial Environmental Examination/ IEE reports for each Subproject and site specific Environmental Management Plan/EMP (separately report for each lot of the subproject).

3. INTRODUCTION

This report is developed for the Subproject on the Improvement of W&W Systems in Noyemberyan town of Tavush region, the design of which has been performed by the JV agreement of HGSN and JINJ LLCs. The Water supply systems rehabilitation involves activities on reconstruction of DRRs, reconstruction of water supply distribution network, as well as construction of new ones, construction of valve junctions and water metering chambers of individual houses.

As a result of the construction work implementation, as well as further operation and maintenance of the water supply systems there might be undesirable negative impacts on the environment.

It is expected that the impacts during construction work implementation will be the least and temporary, probably involving vegetation cut, soil erosion, air pollution, as well as

soil and water resource pollution by lubricants, chlorine compounds, household and construction waste.

At the operation stage the environmental impact, the main reason of which might be improper execution of operation requirements, will decrease.

The significant among positive impacts of the environment is the reservation of water resources and its stable use.
The social and economic effects as a result of water supply system improvement are expected to be mostly positive, such as excluding potable and wastewater mixture, minimization of water pollution risk, prevention and exclusion of infection disease agents penetration into potable water, as well as water supply extension, providing steady water supply and rational water use.
Below the description of possible impacts and facilitating measures required during different stages of water supply systems rehabilitation project is provided.

- ***Design stage***

The design works on water systems have been performed by the JV of HGSN and JINJ LLCs, which was selected as a consultant of the engineering design within the framework of ADB "Water Supply and Sanitation Sector Project – Additional Financing".

The design documents include articles on climatic conditions, relief, natural soil types, hydrology and biodiversity of the very package, as well as requirements on obtaining the RA MoNP and other ministries' agreements. They also include environmental and social articles, as well as EMP of this package and EMP of specific site. The project consultant is in charge to follow the appropriate statements of the RA environmental and social legislation, as well as ADB instructions and strategy requirements which are mentioned in the contract.

- ***Construction stage***

The list of measures required to mitigate the environmental impact during construction stage is provided in the EMP matrix (Appendix 1).

- ***Operation stage***

During the operational stage it should be performed in accordance with operational rules and standards of the water supply to decrease the environmental impact.

During the construction stage the operation should be performed in accordance with the Operational rules and standards.

4. SCOPE OF WORKS

4.1 Description of existing water supply systems

The total length of water supply distribution network of Noyemberyan town covered by the subproject is 35.0km which was built in 1950-60s.
Water supply of Noyemberyan town is carried out from "Berdavan" deep wells by mechanic method from "Gizh sar", "Varar aghbyur", "Spitakashen" and "Srocahanq" springs by gravity system. The regulation of the water supply system of the town was planned to carry out by the help of 6 DRRs.

Water of "Gizh sar" is pumped into 2x500m^3 և 250m^3 DRRs situated in the north high land of the town through the waterlines of 56km length. 2x500m^3 DRRs are in good condition, they have a sanitary zone. There are a chlorination plant structure and a guardhous in DRRs area. The waterline of "Gizh sar" was built in 80s and some sections of the waterline are worn out and need replacing.

"Varar aghbyur" is situated at 4km distance from the town and provides 1.5-3 l/s discharge. Varar aghbyur-Noyemberyan pipeline is mainly made of cast iron pipes, there are also some sections of steel pipes. Water of "Varar aghbyur" is accumulated in 2x250m^3 DRRs situated in the north part of the town and serve the central neighbourhood of the town. These DRRs are in emergency condition and one of them is operated now.

The discharge of "Spitakashen" springs is 1.5-2l/s. Water of the spring is accumulated in "Spitakashen" DRR of 100m^3 volume which is situated in the east part of the town and was reconstructed in 2004. Water is given to the town through the pipelines of about 5-6km length, which is in good condition.

250m^3 DRR situated in highest land of the west part of Noyemberyan town is fed from Berdavan pumping station and it needs repairing. 500m^3 DRR situated in north-west part of the town is also fed from Berdavan pumping station. These two DRRs need repairing.

Berdavan village water supply is carried out from the 4 deep wells which jointly are providing about 20 l/sec water. The water conveyed from the deep wells is stored in 500mcapacity DRR, which feeds about 50% households. The remaining DRRs of 160m and 120m capacities are fed from the operating pump stations. These DRRs need to be repaired. One more DRR of 120m capacity currently does not operate.

The water supply system of Noyemberyan town (wateline of about 5km length and catchment structure) is designed and constructed by own means of AWS LLC from "Srotsahank" springs. Drilling and connection of 2 deep wells to the system of Berdavan as well as repair of Berdavan pumping station by installing new pumping units have been implemented by the loan project of ADB.

In 2010, the deep wells were repaired, new wells were bored and pump stations were built up within the Project funded by the ADB. There were about 10 km long 50-160 mm diameter pipelines laid for the distribution network, including set-up of over 300 individual water metering chambers. Some parts of the village still lack steady water supply. Besides, there are some pipelines which are in technically bad condition.

4.2 Description of proposed rehabilitation works

The following measures were proposed by the detailed design for the improvement of water supply system of.

Noyemberyan town

- Repair of DRRs of 2x500m^3, 2x150m^3, 1x250m^3 and 1x500m^3 capacities in Noyemberyan town including reinforcement of the welding junctions of DRR bottom and walls, construction (4pcs) and repair (1pcs) of regulation and valve chambers, as well as improvement of the area.

- Construction and reconstruction of the distribution network waterlines with polyethylene pipes of de50-de200 diameter, and with total length of about 26km.
- Capital reconstruction of entry lines for total of 1150 house connections of private houses and with construction of water metering chambers.
- Replacement of entry lines (de63) for total of 25 appartment buildings and public units with their buried valve junctions.
- Construction of round chambers in different sections of the town to regulate the water supply distribution network with the installation of fire hydrants.
- Construction of 85 baried valve junctions (BVJ) in the distribution network.

v. Berdavan

- Reconstruction of the existing V=160m and V=120m DRRs;
- Reconstruction and construction of polyethylene pipes of L=3980.0 m total length, de50-de90 diameter;
- Replacement of entry lines of 430 private houses, set-up of water metering chambers,
- Construction and reconstruction of hydrant chambers (2 pieces), valve junctions (6 pieces) and buried valve junction (1 piece).

Works implemented in the scope of this package are summed up in ***Table 1***.

Table 1: Brief description of the works

Works	M/U	Noyemberyan town	v. Berdavan	Total
Repair DRRs	m^3	2050	280	2330
Reconstruction of water supply internal network with de50-de200 dimeter pipes, washing, testing and disinfection	lkm	26,05	3,98	30,03
Construction of entry lines of private houses-with construction of water metering chambers	pcs	1150	430	1580
Construction of entry lines of appartments buildings and public units	pcs	25	-	25
Construction of the buried valve junction	set	85	7	92
Construction of water supply round chambers	set	20	2	22

Under this DD it is planned to rehabilitate the cover of asphalt covered streets in good condition after laying of water lines to its previous quality condition (see General Provisions Book V-1.1).
In all trenches where the backfill on the sand protective layer is planned to be done with sand, it is planned to lay net polyethylene tape at 30.0cm height from the upper level of pipe, throughout the length of the trench.

5. BASELINE ENVIRONMENTAL CONDITIONS

5.1 Geographic location and climate of Noyemberyan town

Noyemberyan town is situated in the north part of Tavush region, on Armenia-Georgia interstate road. The total area is about 3800 ha. The town is the centre of the region and Noyemberyan district, it is located on the slopes of Voskepar mountain range, at the right streamlet valley of Koghb river.

Gugarac mountains stretch in the west and the plain of Bagratashen is in the north. It is 187km away from capital Yerevan. The absolute elevations varry between 400 – 900m.

The relief is compound, the slopes are inclined and dissected, the surface is mountainous, strictly parted. Only the central part of the area is even.

From the geological point of view the area is presented with the rocks of folded block compasition, which are mainly covered by moder alluvial, diluvial-proluvial sediments.

Noyemberyan is located in slightly wet subtropical zone, it has a mild climate with temperate warm summers and mild winters. The average temperature in January is – 1^0C , the average annual temparature is 10.4^0 C. The spring is short and rainy, the summer is long, comparatively cool. The autumn is long-term and mild. The snow cover thickness varries between 10-12cm.

The average annual precipitations is 541mm. South-western and north-eastern winds dominate during the whole year.

5.2 Geographic location and climate of Berdavan village

Village Berdavan is in the northern part of Tavush region, situated nearby the Armenia-Georgia inter-state highway. The area is located on the slopes of Voskepar mountain chain arm of the similar name, in Koghb River valley. The neighborhood hydrological network belongs to the Kura River water intake basin.

The Gugarats mountain chain is in the west and Bagratashen plain is in the north. The distance from Yerevan is 187 km. The absolute elevations range between 400-900 m.

Zorakan and Berdavan villages are situated respectively at distance of 54 and 60 km to the north-west. Berdavan village is located on the Koghb River bank. The area relief is complicated, the slopes are inclined and ragged, and the surface is mountainous, sharply partitioned. Only the area centre is plain.

From the geological aspect the area is presented by the folded clastic rocks which are generally covered by the recent alluvial, diluvial-proluvial sediments.

The area is located in the slightly wet tropical zone with typical moderate hot summers and mild winters. The average temperature in January is -10^0C, and the average annual is 10.4^0C. The spring is short and rainy; summer is long, relatively cool. The autumn is mild and long. The snow cover depth ranges within 10-12 cm. The rainfall average annual amount is 541 mm. During the entire year the south-western and north-eastern winds prevail.

5.3 Biodiversity

Flora: The investigated settlement is situated in Ijevan floristic region of RA, where dominate treses and pushes among the biodiversity of forests. Flora is mainly presented

with the domination of warmwood and mountainous xerophyte species peculiar to dry steppe landscape zone.

Fauna: Fauna species peculiar to mountainous steppe of low height are spread in the observed area. Mammals are presented with rodents, the majority of which have an underground life pattern. Raptiles and amphibians are little in number. We may encounter many species here flying away in spring and autumn seasons.

Dominant fauna species peculiar to that area which are spread in Armenia are the following: wolf, fox, field mouse, partridge, crane and etc.

It should be noted that cultural, archeological or inherited territories are missing in the observed area. The existing areas are situates at a distance of 2-5km from Noyemberyan town and “Zitakar reserve is far from the town about 14km.

Works designed by the subproject are carried out at the town territory where the natural landscape misses.

6. ENVIRONMENTAL AND SOCIAL IMPACTS

As a result of the implementation of works aimed at the improvement of W&W systems the expected positive environmental and population health effects are as follows:

- water resource protection and sustainable use,
- excluding mixing of drinking, irrigation and sewerage water,
- preventing, excluding penetration of infectious disease viruses into drinking water,
- reduction of drinking water pollution hazard,
- providing high drinking water quality,
- improvement of health condition of population,
- water loss reduction,
- increasing duration of water supply to population,
- introduction of water metering system,
- increasing water consumption efficiency.

IEE revealed that the implementation of works aimed at W&W systems improvement will have probable harmful effects on the selected for this purpose area – landscapes, river ecosystems, environment and human health.

The negative effects on the environment, aquatic ecosystems and people might be mainly caused by construction works implementation, and expected to do little damage and be temporal. They can be prevented or mitigated as a result of best construction practice.

Based on the initial assessment, the following adverse impacts can be expected:

- air pollution
- noise
- traffic and pedestrian roads congestion
- soil erosion and soil eroding processes
- environment and water resources pollution by construction and household waste

- soil and water resources pollution by fuels and lubricants,
- soil and water resources pollution by chlorine.

Subproject implementation will have positive social effects directly improving the population life quality in Noyemberyan town and in Berdavan village, providing sustainable and reliable water supply and water resource rational use for about 8 thousand people.

7. ENVIRONMENTAL IMPACT MITIGATION MEASURES

Adverse impacts on the environment and human health while implementing construction works for the improvement of Noyemberyan and Berdavan communitiy's water supply system are possible during the construction of: (i) trenches for water lines, (ii) pits for regulating and water metering nodes, (iii) rehabilitation of pump station.

To prevent soil erosion and drilling processes**,** the following is to be implemented: in inclined sites of the water line route implement measures for retaining the inclinations, minimize the time during which trench and pit excavations for regulation and metering nodes are open.

At works near river and tributary bed areas, the inclinations should be retained to prevent soil erosion and sediment transport.

- remove the excess soil mass and building material from the construction sites after completion of construction activity,
- recover the asphalt – concrete pavement, providing its previous good condition and quality,
- provide graveling with compaction on the streets with damaged and half-destroyed asphalt-concrete pavement, as well as on earth roads.

To prevent the *topsoil layer damage, or landscape degradation*, the topsoil should be stored on the assigned site, thereafter used for the areas restoration. The construction site should be cleaned from the household and construction waste providing the previous state of landscape.

To exclude *land and water resources pollution with fuels and lubricants***,** the latter must be stored on a sealed surface, away from water resources, plan use of special tanks for their collection, which will then be removed to special sites envisaged for re-treatment.

To prevent *environment pollution with construction and household waste***,** remove construction waste to corresponding landfill of the community, having in advance a contract agreement with the community heads or landfill operators.

To exclude *land and water resources pollution with chlorine***,** organize works for washing the water supply distribution network with chlorine, according to calculations. Provide appropriate technical means; implement chlorine discharge to surface water

body or land area after washing the pipes, according to the regime planned under the design.

Water quality change – Environmental monitoring plan must include also control over water quality and residual chlorine level.

To reduce *dust during the construction works*, the construction site and roads are to be regularly watered.

To prevent *noise,* night work in residential areas is to be limited, and usage of machines/equipment with extra noise is to be avoided; installation of silencers if needed.

To reduce disturbance to population because of overloaded roads safe area for trucks is to be provided; waste on the construction site must not be accumulated and burnt, construction should be implemented in stages, adequate notice of construction activities must be given to the population the traffic flow should be regulated if required. As well as effective road signs, temporary safety bridges as alternative walk way and tape fencing safety purposes are to be provided. Diversions or barricades are to be organized. Adequate street lighting in suitable places when passers-by or entry by public is likely is to be provided.

To prevent *hazards for workers and the population* during the construction, the following must be implemented: install fencing around construction site; control access of unauthorized persons to site; place warning signs in dangerous places; carry out regular examination of equipment by highly qualified staff, as well as make regular safety audits; provide first aid and safety training to construction staff.

Provide community participation in subproject design, which will minimize disruption to community social activities.

Drinking water quality change: Environmental monitoring plan must include also control over water quality and residual chlorine level.

To provide drinking water quality in subproject communit's, AWSC will implement planned sampling of water from the water sources feeding the town, checking all the parameters required by the Ministry of Health. Water quality monitoring is carried out also by State Hygienic and Epidemiological Surveillance Inspectorate, according to "Drinking Water. Requirements to the Centralized Water Supply System's Water Quality"; Quality Control № 2-III-A'2-1 sanitary rules and norms" (registered on 28.12.2002), document, which establishes the requirements to the drinking water quality, as well as the rules for quality control of water produced and supplied to residential area through water supply systems.

Since disinfecting is done by chlorine, also residual chlorine level monitoring must be done.

For mitigation or prevention of the above mentioned adverse impacts, mitigating measures are planned and environmental management plan EMP (Appendix 1), as well

as site specific environmental management plan EMP (Appendix 2) were developed, which shall be followed by the contractor, controlling and supervising units.

The EMP is an environmental assessment document and is included in the detailed designs.

8. INSTITUTIONAL FRAMEWORK OF ENVIRONMENTAL MANAGEMENT

The organizational obligations for the proposed mitigating measures are distributed among the following agencies:

- ***Executive agencies, which are responsible for implementation of the measure.***

1. For this special task the executive agency (HGSN LLC and JINJ Ltd. joint venture) must provide in the design stage obtaining of all the required agreements and permits from corresponding state and local authorities, before tendering the construction works;
   - Conclusion of environmental expert examination (if needed),
   - Agreement of the State Agency for Protection of Historical and Cultural Monuments, if impact is envisaged by the design.
2. The executive agencies in the construction stage (construction cotractors) will be responsible for physical implementation of mitigating measures planned under the EMP, as well as for obtaining of all permits and agreements required during the construction implementation. Those are:
   - Agreements from the local self-governing authorities for the sites alloted for transportation of wastes and construction garbage,
   - Agreement of the State Agency for Protection of Historical and Cultural Monuments, if unexpectedly historical and cultural or archaeological monuments are discovered during the construction implementation.
3. Before commencement of the construction, the following permits and certificates must be obtained from ADB/PMU, if needed:
   - Cadastre certificate on the land allotment;
   - Water use permit, if needed.

- ***Controlling agencies, which are responsible for controlling the executive units to provide implementation of the EMP measures by the latter***

1. AWS CJSC/ADB PMU environmental specialists will be responsible for in time, due and reliable implementation of the works and measures in the order under the EMP and SSEMP. The mentioned specialists will regularly visit the construction sites to provide due implementation of the measures aimed at mitigation of work impact. During the visits the possible gaps will be identified and the infringements in implementation of mitigating measures will be discovered, in accordance with the field visits checklist (Appendix 3).

The AWS CJSC/ADB PMU has the right also to require and check whether all permits are available and valid, all the measures and monitoring part under the EMP are implemented during the construction, in accordance with ADB guidelines and the RA environmental and social legislation.

2. HGSN LLC and JINJ LLC joint venture will also implement control of implementation of mitigating measures, during the construction. The environmental specialist shall make visits to control the EMP and SSEMP implementation and assess the situation according to the Emissions/Ambient Inspection Monitoring Form (Appendix 6).

- ***State monitoring agencies, which are responsible for observing the extent and efficiency of EMP implementation and making corrections in the project, if needed.*** The state monitoring agencies are as follows:
  - State Environmental Inspectorate under the Ministry of Nature Protection, RA
  - Public Healthe State Inspectorate under the Ministry of Healthcare, RA
  - The State Agency for Protection of Historical and Cultural Monuments, RA, if necessary,
  - The RA local self-governance bodies,
  - The RA Ministry of Transport and Communication.

The amounts envisaged for implementation of environmental measures included in the EMP and SSEMP are included in the detailed design.

Implementation of mitigating measures for environmental impacts will be controlled regularly through visits to the construction sites. With the help of the specially developed check list the gaps and drawbacks will be discovered.

In case of not implementing or infringing the implementation of the mitigating measures, after warning, the next payment will be terminated until the infringement is completely eliminated.

9. ENVIRONMENTAL CONSULTATIONS

During the meetings organized within the framework of public awareness campaigns, the environmental and social impacts of the planned works were represented to the beneficiary and affected communities of Noyemberyan town sincluded in the sub-project.

To provide the presence of all beneficiaries, preliminary agreements were gained with the community head (Mayor), company staff, Environmental Information Center functioning in Tavush region, environmental NGOs and other stakeholders.

The meeting in Noyemberyan, which was held on 26.08.2013 AWS Noyemberyan administration, was attended by the Mayor, head of AWS administration, school and kindergarten staff members, teachers, community inhabitants, particularly women and

elderly people from the most vulnerable group, for whom the improvement of the water supply systems is of vital importance (24 people in total, see *Figure 1*) .

The meeting in Berdavan village was held on December 18 in the administrative center of the village involving participation of theheads of the mentioned villages, staff of the administrative centre, representatives of the council, personal of medical ambulatories, schools and kindergartens, housewives and elderly citizens (17 people in total).

During the meetings the works planned under the detailed design in each community were represented, after which the environmental specialist represented the possible adverse environmental impacts described in the environmental management plan for each design.

The latter is the description of the negative impacts on the environment, population health and safety of construction workers, which are possible during the subproject implementation in design, construction and operation stages. The list of the measures mitigating or preventing these possible negative impacts was also represented.

The community's residents were mainly concerned with the following problems arising during the construction works:

- infringement of traffic and pedestrians normal regime because of presence of open trenches for a long time, as well as improper rehabilitation of roads after the construction;
- hazardous situation for children and elders because of absence of warning signs and not limiting the construction site with tapes;
- pollution of the settlement with construction and household waste during the construction, as well as construction garbage not removed after the construction;
- termination of water supply for a long time (sometimes 1-2 days) during the construction;
- presence of dust during dry weather;
- Improper washing and disinfecting of new pipes, resulting in unclean water in flats for a long time.

During all meetings the women's presence and active participation was provided. Female employees of the local schools, kindergartens and ambulatory stations took part in the meetings.

After representing the EMP, the environmental specialist asked the two communities' residents to get acquainted in detail with the environmental management plan and during the construction follow implementation of the measures included in the plan.

The environmental management plan was copied and disseminated among the participants of the meeting, as well as in village halls.

Contact person of residential areas are:

Noyemberyan town	v. Berdavan
Mayor: Vanush Amiraghyan	Head of the village: Ararat Gabrielyan
Tel. (+374 266) 2 38 03;	Tel. (+374 266) 2 20 22
www.noyemberyan.am	E-mail: berdavan.tavush@mta.gov.am

Environmantal consultation


t. Noyemberyan


v. Berdavan

Figure 1: Environmental consultations.

10. GRIEVANCE MECHANISM FOR AFFECTED PUBLIC

A grievance mechanism for external stakeholders and affected public is a process focused mainly on receiving, evaluating, and addressing project-related grievances from affected communities at the level of the ASMWP. The grievance mechanism differ from other forms of dispute resolution (e.g. courts, administrative systems, etc.) in that is offers the advantage of a locally based, simplified, and mutually beneficial way to settle issues within the framework of the relationship between the ASMWP and the community.

Properly designed and implemented grievance management processes can benefit both the ASMWP and communities by increasing the likelihood of resolving minor disputes quickly, inexpensively, and fairly with solutions that reasonably satisfy both sides without taking the grievances to other (formal) dispute resolution body. Grievance mechanisms can help to identify and resolve issues before they are elevated to formal dispute resolution methods, including the courts. For a grievance mechanism to function effectively, it is important to define the grievance processing structure and to assign

responsibilities for the mechanism's implementation and make them clear for the stakeholders.

Contact details for questions, complains and recommendations from the external stakeholders of the ASMWP are as follows:

1 71 - AWSC Customers Support Calling Center,
Investment Program Coordination Department
Mrs. Lilit Hovhannisyan-Environmental and Social Impact Specialist

Address 8A Vardanants blind alley, Yerevan 0010, Armenia
Phone / Fax (+374 10) 542877
E mail: lhovhannisyan@armwater.am

AWS CJSC will register all the complaints.The Complaints Log form is provided in Appendix 4.
The focus of the grievance mechanism on the needs of affected communities is substantiated by the fact that they are directly, and in some cases significantly, affected during the project implementation but often lack viable options or capacity for raising their concerns through formal structures such as the courts. This is especially true for disadvantaged groups within communities. The ASMWP should periodically review the adequacy of the grievance process, with the participation of communities, and agree on modifications. The contact details will be provided in construction information posters and information leaflets distributed in the project affected communities during the public consultations. Questions and comments expressed during the public meetings will be recorded and addressed during the design and implementation of the ASMWP.
A grievance mechanism will be available to allow an AP appealing any disagreeable decision, practice or activity arising from disturbance during the construction works. APs during public consultation will be fully informed of their rights and of the procedures for addressing complaints whether verbally or in writing during consultation, survey, and time of compensation. This can be obtained through by ensuring full participation and consultation with the APs, and by establishing extensive communication and coordination among the affected communities, the PMU and town or community heads. The below grievance mechanism does not limit the citizen's right to submit the case to the court of law just in the first stage of grievance process.

10. ENVIRONMENTAL MANAGEMENT PLAN

The EMP and the SSEMP will be based on the results of IEE prepared by subproject and will include appropriate mitigation measures.

EMP consists of two components:

1. Mitigation measures and institutional responsibilities for implementation;
2. Environmental monitoring.

In case if an unanticipated environmental impact arises during the construction, the Table provided in Appendix 5. *Unanticipated Impact / Significant Incident / Accident Notice* will be filled up and attached to the varied orders.

The **Contractor** should strictly follow the environmental mitigation measures prescribed in the EMP and SSEMP. The costs foreseen for the implementations of all the measures prescribed in the EMP and SSEMP are included the total value of the Contract.

Notice on the failure to implement measures prescribed by the Technical Supervision Company (TSC) or the Client would be sent to the **Contractor** in written. After the Notice to Correct, the next recorded violation would trigger charging of liquidated damages in the amount of 0, 1% of the total value of the contract. The liquidated damages do not relieve the Contractor from remedying the violation. The recorded violation should be remedied in two working days period. Liquidated damages would be retained from the next Performance Certificate and after the completion of the construction activities the liquidated damages for the recorded violation will be retained from the Retention Money. In case of three liquidated damages the Contract could be terminated unilaterally.

Above described remedies of EMP violation will be included in the contracts for provision of works concluded by AWSC under the W&W project.

APPENDIX 1: ENVIRONMENTAL MANAGEMENT MATRIX

Works and possible impacts	Proposed mitigating measures	Monitoring	Responsible bodies
Construction			
1. Air pollution, noise, traffic congestion – Dust and noise during the construction works - Disturbance to population because of overloaded roads	- Install fencing around construction site - regularly water the construction site and roads, - limit night work in residential areas, - Avoid usage of machines/equipment with extra noise; installation of silencers if needed, - Provide safe area for trucks, - Do not accumulate and burn waste on the construction site, - Carry out construction in stages, give adequate notice of construction activities to the population, - Provide effective road signs, diversions or barricades, - Provide adequate street lighting, - Provide community participation in subproject design, which will minimize disruption to community social activities	Daily site inspection	Constructor, Consultant, PIU
2. Environmental pollution – Soil erosion and sediment transport – Environment pollution with construction waste – Land and water resources pollution with fuels and lubricants	- In inclined sites of the waterline measures for retaining the inclinations shall be carried out, - Minimize the time during which trench and pit excavations for regulation and metering nodes are open - Rehabilitate disturbed surfaces as soon as possible after completion of construction activity, according to the design - Store oil, fuels and lubricants on a sealed surface, away from water resources, - Remove construction waste to corresponding landfill of the community, having in advance a contract agreement	Daily inspection of construction contract and maintenance	Constructor, Consultant, PIU

Works and possible impacts	Proposed mitigating measures	Monitoring	Responsible bodies
Construction			
- Land and water resources pollution with chlorine	with the community heads or landfill operators, - Organize works for washing the water supply distribution network with chlorine, according to technical calculations. Provide appropriate technical means. - Implementation of chlorine discharge to surface water body or land area after washing the pipes, according to the regime planned under the design, MPV.		
Health and Safety – Hazards for Workers and the population	- Install fencing around construction site - Control access of unauthorized persons to site - Place warning signs in dangerous places - Carry out regular examination of equipment by highly qualified staff, as well as make regular safety audits, - Provide first aid and safety training to construction staff	Daily inspection throughout construction stage. Monthly inspection of accident reports and complaints register	Constructor, Consultant, PIU, Population

APPENDIX 2: SITE SPECIFIC ENVIRONMANTAL MANAGEMENT PLAN

Water supply systems improvement of Noyemberyan town and Berdavan village - I package

No	Construction Activities	Hazards to Consider	Likelihood of risk/Value	*Cause of risk/ value*	Risk/Value	*Mitigation measures*
1.	Construction/reconstruction of DRRs, internal network and water water supply and metering chambers ,	Dust	Certine/5	Major/3	15	- Regularly water the construction site and roads.
		Noise	Likely/3	Major/3	9	- Limit night work in residential areas. - Avoid usage of machines/equipment with extra noise. Installation of silencers if needed.
		Disturbance to population because of overloaded roads	Certine/5	Major/3	15	- Provide safe area for trucks. - Carry out construction in stages, give adequate notice of construction activities to the population, and regulate traffic flow if required. - Provide effective road signs, temporary safety bridges as alternative walk way, and tape fencing safety purposes. - Organize diversions or barricades. - Provide adequate street lighting - Proper signage and lighting in suitable places when passers-by or entry by public is likely
		Construction and household waste	Certine/5	Major/3	15	- Do not accumulate and burn household waste on the construction site. - Accumulate the construction and household waste temporary at 100m

No	Construction Activities	Hazards to Consider	Likelihood of risk/Value	*Cause of risk/ value*	Risk/Value	*Mitigation measures*
						distance from the river banks. - Remove construction waste to corresponding landfill of the community, having in advance a contract agreement with the community heads or landfill operators. - Do not mix household waste with construction waste and place them into dustbins. - Filling of the construction and household waste into the river and its streamlets shall be excluded.
		Chlorinated water arised from the washing of pipes	Certine/5	Catastrophic/5	25	- Organize works for the disinfection of water supply pipes with chlorine, according to technical calculations - Provide appropriate technical means. - Implementation of chlorine discharge to surface water body or land area after washing the pipes, according to the regime planned under the design, and corrsponding background value.

ՀԱՎԵԼՎԱԾ 3. ԴԱՇՏԱՅԻՆ ԱՅՑԵՐԻ ՍՏՈՒԳԱԹԵՐԹԻԿ

APPENDIX 3: FIELD VISITS CHECKLIST

Ընդհանուր տեղեկատվություն General information	Ամիս/ամսաթիվ D/M/Y				**Corrective Action Request ուղղիչ միջոցառումների պահանջ**
	Ենթածրագիր / Subproject				
	Տեղակայում / Location				
	Շինարարականկազմակերպություն/ Constriction contractor				
	Մարզ / Marz				
Նախագծում Design					
Անհրաժեշտություն լտվություններ Required permissions	Բնապահպանական փորձաքննության եզրակացություն / EEC	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Հողհատկացման գրավոր համաձայնություն / writen consent on land acquisition	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Պատմամշակութային փորձաքննություն / assessment of impact on cultural heritage	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
Շինարարություն Construction					
Անհրաժեշտությույլ-տվություններ Required permissions	Շին.թափոնների տեղադրման գրավոր համաձայնություն / written consent on disposal of construction waste	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Անսպասելիորենհայտնաբերմանդեպքումպատմամշակ. համաձայնություն / written consent in case of sudden discovery of cultural heritage	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Հասարակության իրազեկում Public awereness				
	Շին.աշխատանքների վերաբերյալ բնակչության համապատասխան իրազեկում համաձայն նախագծի / awareness of population regarding construction works according to the project design	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Համայնքի մասնակցություն շինարարականաշխատանքներին՝ համաձայն նախագծի / community's participation in construction works according to the project design	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
Անվտանգություն Safety					

Բանվորների անվտանգություն Safety of workers	Բանվորների անվտանգության հանդերձանքի առկայություն /ականջակալներ, շնչադիմակ/ availability of safety uniforms (earflaps,mask)	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Շինարարության մեջ ներառված տեխնիկական միջոցների պարբերական զննումներ՝ անվտանգությունն ապահովելունպատակով / regular study of equipment used for construction for safety matter	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
Բնակչությանանվ տանգություն Safety of population	Երթևեկության սահմանափակման կամ խախտման ժամանակ համապատասխան ճանապարհային նշանների կամ պատնեշների տեղադրում, շրջանցիկազմակերպում / Installation of road signs or fences, organization of a bypass during interrupted or limited traffic	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
<u>Շինարարության իրականացման ժամանակ կառավարման միջոցառումներ</u> <u>Management measures during construction</u>					
Շին.հրապարակի/ տեղանքիշահագործում / Operation on area/construction site	Շին.հրապարակի/տեղանքի պարբերաբար ջրում / regular sprinkling to area/construction site	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Մեքենաներիհամարապահով տարածքի առկայություն շին.հրապարակում / availability of safe place at the construction site for vehicles	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Յուղերի և քսուկների համապատասխան պահեստների առկայություն շին.հրապարակում / availability of storage for oils and lubricants at the appropriate part of the construction site	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
<u>Օդի ժամանակավոր աղտոտում</u> <u>Temporary air pollution/dust</u>					
	Շինանյութ տեղափոխող բեռնատարների վրա ծածկի օգտագործում / use of cover for the vehicle transporting construction waste	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Շինարարության տարածքի խոնավեցում ջրի շիթով / moisturing of the construction site by water	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
<u>Հողի էրոզիա</u> <u>Soil erosion</u>					
	Զառիվար տեղերում հողի էրոզիայի կանխարգելման միջոցառումների իրականացում ըստ նախագծի / soil erosion prevention measures at the slope places according to the project design	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Փոսորակների ժամանակին հետլիցք / timely backfill of pits	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Շին.աշխատանքների ավարտից հետո վնասված մակերեսների վերանորոգումըստնախագծի / repair of damaged surface after completion of construction works	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
<u>Ջրի աղտոտում</u> <u>Water pollution</u>					

	Ջրի աղտոտում քսանյութերով և վառելանյութերով /water pollution caused by fuel and lubricants	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
	Խողովակների լվացումից հետո քլորի արտահոսք համապատասխան նախագծով նախատեսված ռեժիմի / Leakage of chlorine after wash up of the pipes according to the scheduled regime.	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
<u>Աղմուկ բնակավայրերի տարածքին մոտ</u> <u>Noise close to settlements</u>					
	Աշխատանքների իրականացում սահմանված աշխատանքային ժամերին, հակառակ դեպքում՝ սահմանվածկարգով / implementation of the works during working hours, otherwise in projected manner	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
<u>Շինարարականնկենցաղայինթափոններիտեղադրում</u> <u>Construction west disposal</u>					
	Շինարարական և կենցաղային աղբի տեղափոխում և տեղադրում համայնքի համապատասխան աղբավայրում / transportation and disposal of construction and consumer waste in appropriate community landfill	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	
<u>Շահագործում</u> <u>Operation</u>					
Խմելու ջրի աղտոտում / Drinking water pollution	Մնացորդային քլորի քանակի համապատասխանում խմելու ջրի որակի նորմերին / Correspondence of balance quantity of residual chlorine to the quality of potable water	**Այո Yes**	**Ոչ No**	**Ո/Կ N/A**	

APPENDIX 3: COMPLAINTS LOG

Log number	Date / Location	Complainant/ Date of Contact	Details of Complaint	Investigation / Mitigation Action	Resolution Status*

**Open or Closed (If closed include date)*

Filed by PIU Environmental Specialist: _____

Date:_____

APPENDIX 4: UNANTICIPATED IMPACT / SIGNIFICANT INCIDENT / ACCIDENT NOTICE

Date/ Location Of Incident	Description of incident/Impact including Magnitude and Control Action taken at the time	Evaluation of Consequences	Corrective Action Required including Deadline, and Lessons Learned

Jointly signed by:

Site Supervision Engineer:_____ Date:_____

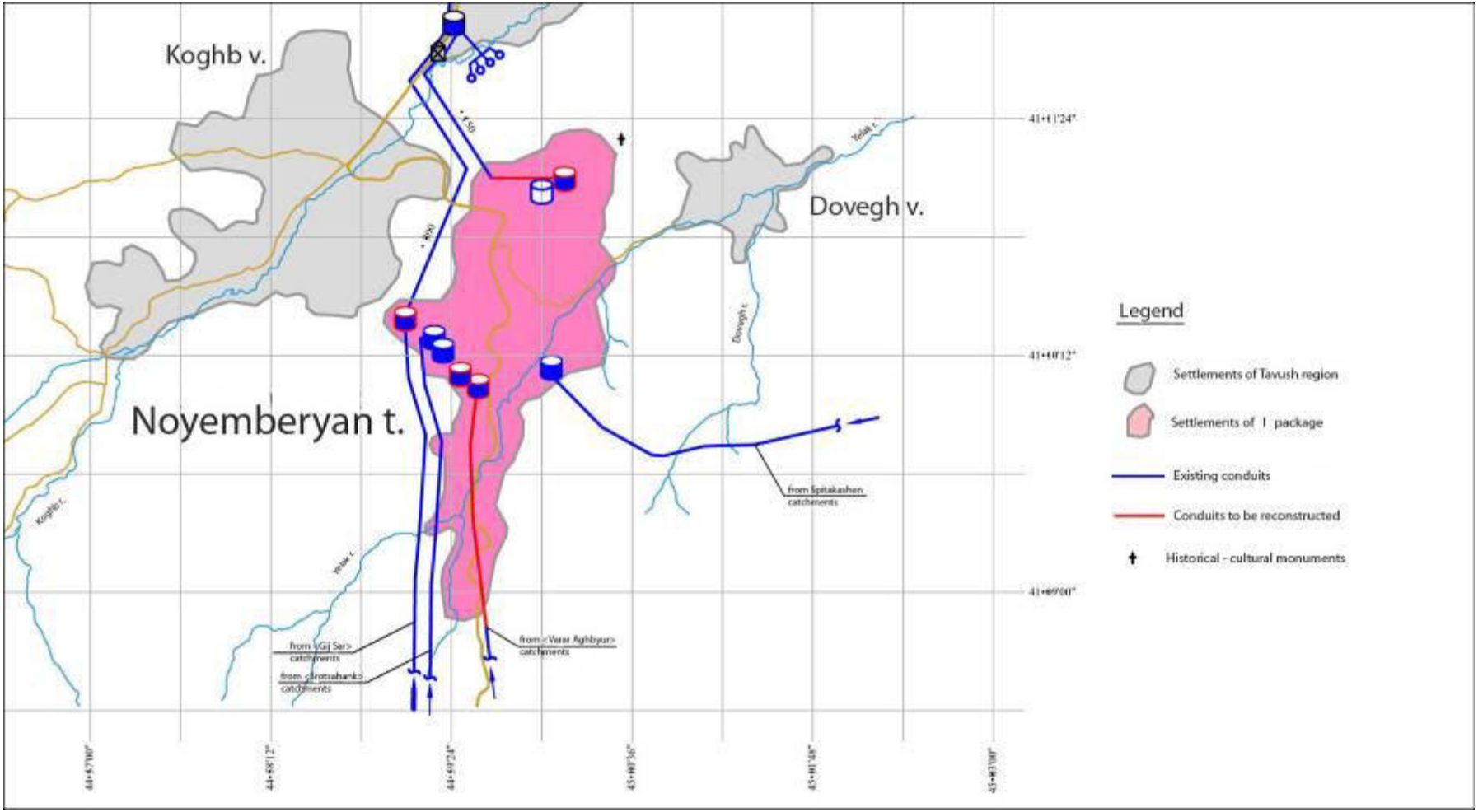
Contractor:_____ Date:_____

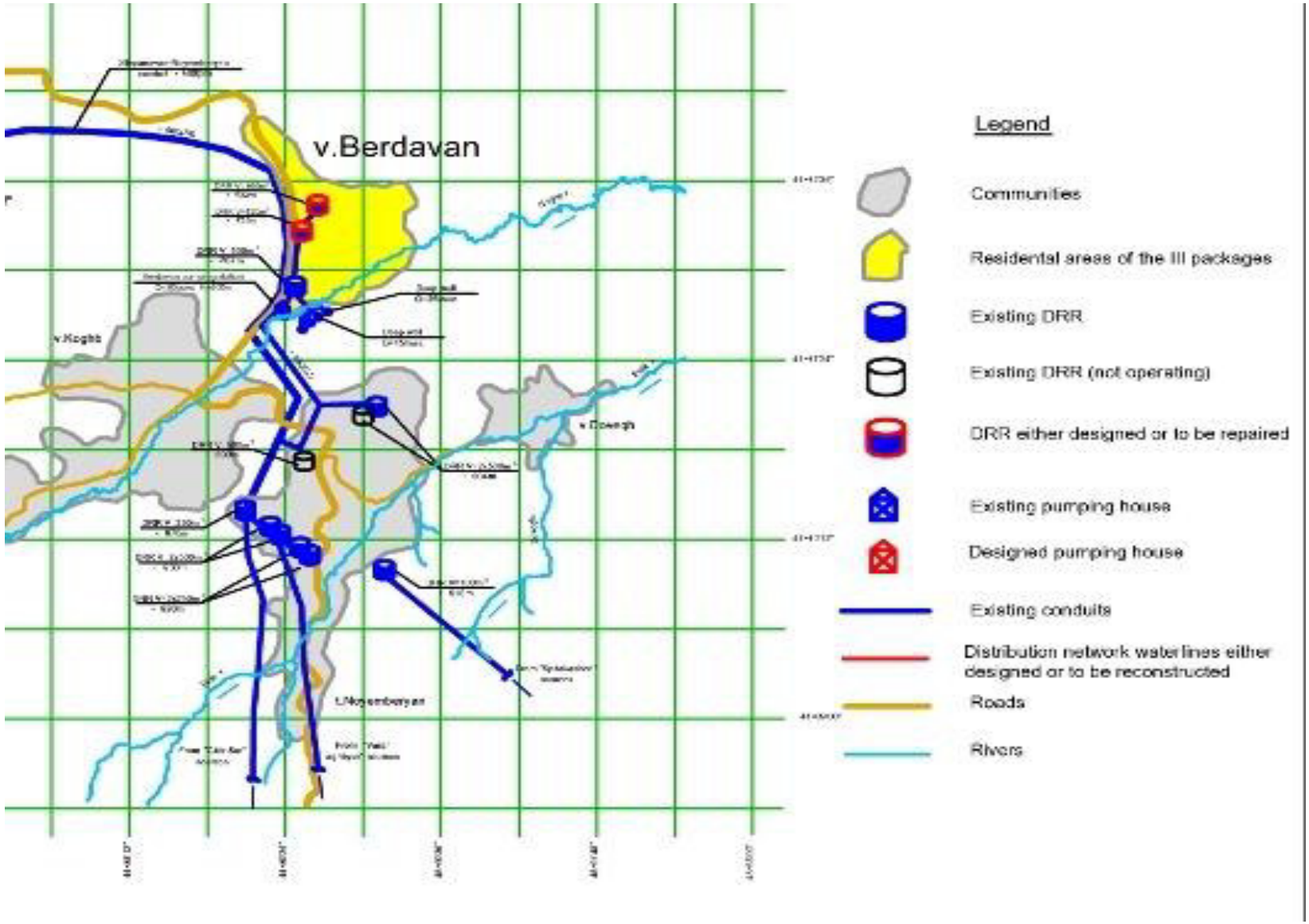
Appendices:
(e.g. photographs, laboratory reports, etc.)

APPENDIX 5: EMISSIONS / AMBIENT MONITORING FORM

Parameter	Date / Location	Measured By	Monitoring Method / Equipment used	Result	Performance Standard	% Exceedence	Reason for exceedence and Corrective Action Request if works related	Resolution Status of previous CAR

APPENDIX 6: SUBPROJECT LAYOUT




v.Berdavan
v.Koghb
v.Dsegh
Legend
Communities
Residental areas of the III packages
Existing DRR
Existing DRR (not operating)
DRR either designed or to be repaired
Existing pumping house
Designed pumping house
Existing conduits
Distribution network water lines either designed or to be reconstructed
Roads
Rivers

APPENDIX 8. ENVIRONMENTAL CONSULTATIONS, LIST OF PARTICIPANTS

village Berdavan

ՋՐԱՄԱՏԱԿԱՐԱՐՄԱՆ ԵՎ ՋՐԱՀԵՌԱՑՄԱՆ ՍԵԿՏՈՐԻ ԾՐԱԳԻՐ.
ԲԱՂԱԴՐԻՉ Բ. ԿԱՐՈՂՈՒԹՅՈՒՆՆԵՐԻ ԶԱՐԳԱՑՈՒՄ ԵՎ ՀԱՆՐԱՅԻՆ ԻՐԱԶԵԿՄԱՆ ԱՐՇԱՎ

/ Water Supply and Sanitation Sector Project:

Package B: Capacity Building and Awareness Campaign

«19 [illegible]» 2014թ.

Քաղաքի/Գյուղական համայնքի անվանում գ. Բերդավան

Քննարկման թեման [illegible]

Տևողություն 11³⁰

Թրեյների(ների) Անուն, Ազգանուն [illegible]

Մասնակիցների ցուցակ

No	Անուն, Ազգանուն	Պաշտոն	Հեռախոսի համար	Ստորագրություն
1	[illegible]	[illegible]	077-00-08-05	[illegible]
2	[illegible]	[illegible]	055072776	[illegible]
3	[illegible]	[illegible]	055612994	[illegible]
4	[illegible]	[illegible]	096-146-950	[illegible]
5	[illegible]	[illegible]	041 100888	[illegible]
6	[illegible]	[illegible]	093 86 27 97	[illegible]
7	[illegible]	[illegible]	055903124	[illegible]
8	[illegible]	[illegible]	091685380	[illegible]
9	[illegible]	[illegible]	055-769-668	[illegible]
10	[illegible]	[illegible]	077-57-79-30	[illegible]
11	[illegible]	[illegible]	043 061918	[illegible]
12	[illegible]	[illegible]	098313173	[illegible]
13	[illegible]	[illegible]	055-17-58-48	[illegible]
14	[illegible]	[illegible]	077-28-01-28	[illegible]
15	[illegible]	[illegible]	093-09-68-23	[illegible]
16	[illegible]	[illegible]	094-07-28-66	[illegible]
17	[illegible]	[illegible]	094590664	[illegible]
18				