No.49 Shenavan

Information on Existing Water Sources (Aragatsotn)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.49 Community Shenavan
District Aparan
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Spring	40	29	24.7	44	16	6.8	2,451	2.0	6.0	4.0
2	spring	40	29	21.4	44	17	10.4	2,314	0.4	2.0	1.0
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Acceptable
Notes	The water main and the internal network are in a destroyed condition, there is 60% leakage. The spring intakes are in a destroyed condition.
Alternative sources if any	In case of proper water collection in springs and repair of spring intakes, the flows will increase.

No.49 Community Shenavan
District Aparan
Marz Aragatsotn
Sampling date 31/Jul/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		7.3				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	9.3					
c	TDS	Mg/L	27				1000	1000
1	Al:Aluminum	Mg/L	0.02				0.10	0.50
2	B:Boron	Mg/L	n.d				0.70	0.50
3	Cl:Chloride	Mg/L	4				250	350
4	Cr:Chrome	Mg/L	<0.01				0.05	0.05
5	Cu:Copper	Mg/L	n.d				2	1
6	F:Fluoride	Mg/L	0.03				1.50	
7	Hardness	Mg/L	40				500	700
8	Fe:Iron	Mg/L	n.d				0.30	0.30
9	Mn:Manganese	Mg/L	n.d				0.40	0.10
10	Mo:Molibdenum	Mg/L	n.d				0.070	0.250
11	Ni:Nickel	Mg/L	n.d				0.020	0.100
12	Nitrate(NO3+)	Mg/L	1.3				50.0	45.0
13	SO4:Sulfate	Mg/L	5.0				250.0	500.0
14	Zn:Zink	Mg/L	n.d				3.0	5.0
15	As:Arsenic	Mg/L	n.d				0.0	0.1
16	Ba:Barium	Mg/L	<0.01				0.70	0.10
17	Be:Berillium	Mg/L	n.d				NA	0.00020
18	Cd:Cadmium	Mg/L	n.d				0.0030	0.0010
19	Pb:Lead	Mg/L	0.001				0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002				0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001				0.010	0.010
22	Sr:Strontium	Mg/L	n.d				NA	7.0
23	CN:Cyanide	Mg/L	n.d				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml	<3				-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml	n.d				0	0
26	Total bacteria	bacteria per 1 ml	30				-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.49 Community Shenavan
District Aparan
Marz Aragatsotn

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not Identified	Not Identified
1	1			0.0	Not Identified
2	2			0.0	Not Identified
3	4			0.9/1; 2.1/1	Not Identified
4	5			0.4/4	Not Identified
5	6			2.3/3; 2.8/1; 4.3/3; 9/2	Identified in 2 sample
6	7			4.3/2, 7.5/1; 9/2	Identified in 5 sample

No. 49 **Marz** Aragatsotn **Community** Shenavan

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Difficult	Unknown	
2	Transmission pipeline	Difficult	Unknown	Pipeline is mostly far from the road
3	Reservoir	Fair	Possible	

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°29'24.7″	44°16'06.8″	2,451	1978	reinforced concrete	4.0	Yes
2	Spring	40°29'21.4″	44°17'10.4″	2,314	1964	reinforced concrete	1.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	11,050	150	Steel	2.0	1981	Huge	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°28'48.3″	44°21'46.9″	1,961	reinforced concrete	Rectangular	2x(12x12x4)	2x500	Yes

5. CHLORINATION

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	Yes	Reservoir	Powder	2time per month

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	4,000	150	Steel	1981	Huge	Yes
2	800	125	Steel	1981	Huge	Yes
3	7,550	100	Steel	1981	Huge	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
No							

8. PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
12	1981		Yes	50	Yes

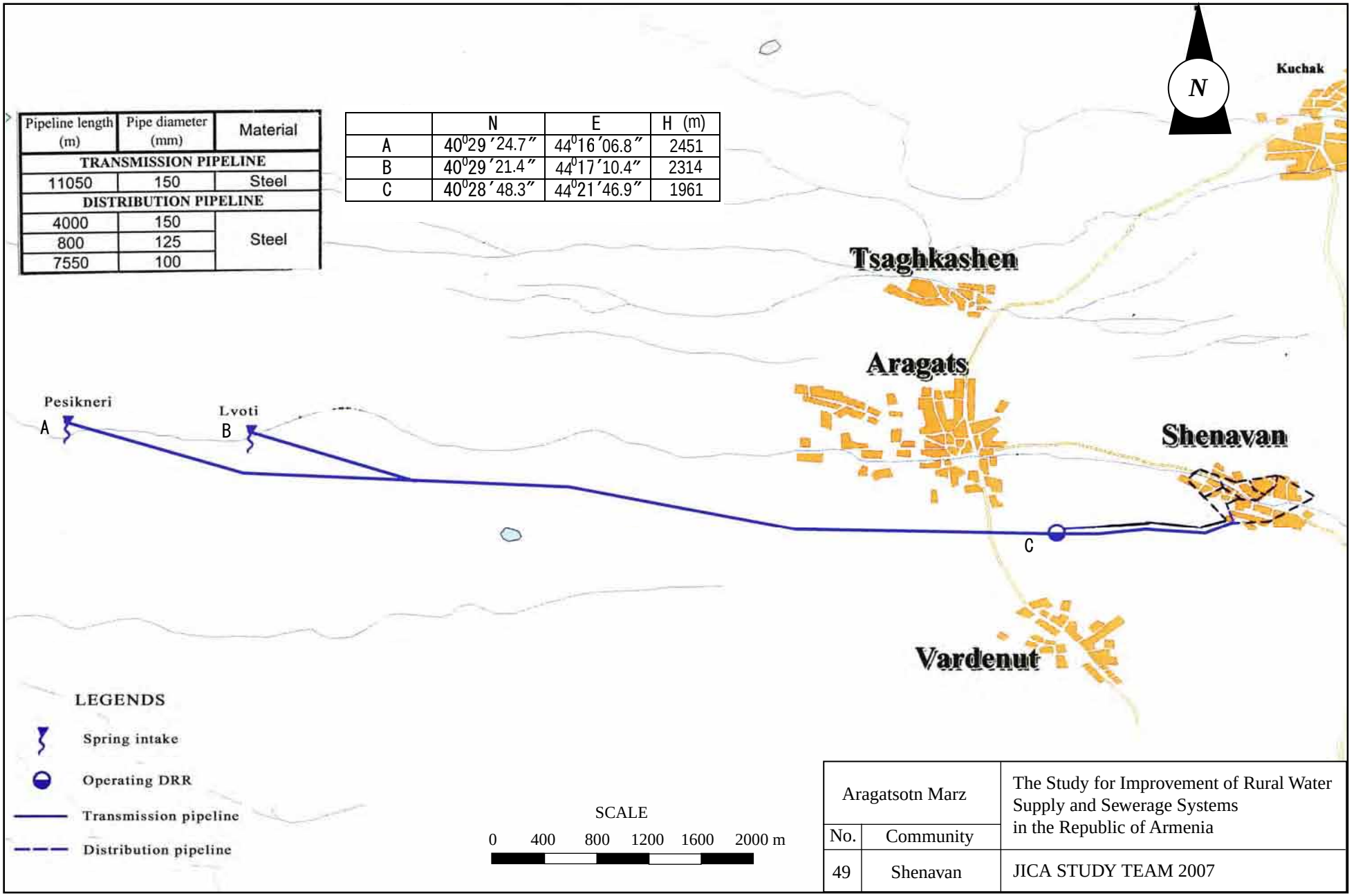
9. DRAINAGE SYSTEM

Existence (Y/N)	Rehabilitation Necessity	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.49 Shenavan**
District	**Aparan**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	1,958
A2	Actual population in 2007	1,700
A3	Number of households	378
A4.1	Elderly people	490
A4.2	Population in labor force (age from 16 to 62)	650
A4.3	Children	550
A5.1	Pensioners	500
A5.2	Unemployed	0
A5.3	Receiving benefits	42
A6	Average monthly income of household (AMD)	15,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	400
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	2,200
	Annual Budget of the community 2005, in thousand AMD	3,000
	Annual Budget of the community 2006, in thousand AMD	7,000
	Annual Budget of the community 2007, in thousand AMD	1,720
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	300
	Amount spent in drinking water sector 2005, in thousand AMD	400
	Amount spent in drinking water sector 2006, in thousand AMD	800
	Amount spent in drinking water sector 2007, in thousand AMD	700
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned.
C: Socio-Economic Survey		
C1	Major industries of the community:	cereals, vegetables
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1-Yes, 2-No	yes
D2	Water use permit number	0748
D3	Date of expiry of water use permit	2006-2009
D4	Planned date of obtaining water use permit	-
D5	Present condition of the water supply volume of Domestic use	insufficient
D6	Present condition of the water supply volume of Irrigation water	insufficient
D7	Number of house connection to drinking water system	378
D8	How many house connection household set the water meter	0
D9	Number of public taps	15
D10.1	How is the regime of water supply in your community in the dry season?	regularly 5 hrs
D10.2	How is the regime of water supply in your community in the wet season?	regularly 6 hrs
D11	What time of day water is given?	9-14;
D12	Are you pleased with duration of domestic water supply?	mainly displeased
D13	Are hours of water supply convenient?	fully convenient
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	1,000
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	1,100
D16	Drinking water monthly water fee per household	250
D17	How often do you usually pay water fees?	irregularly, when affordable
D18	Water fee structure 1Flate rate, 2 Having water tariff	flat rate
D19	Where do you acquire the irrigation water?	spring
D20	Are you satisfied with irrigation water supply volume?	is not sufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Grigoryan Taron
E2	Position	architecture
E3	Telephone	(093)651304
E4	Quantity and present condition of the water supply facilities: spring/ intake	2 deteriorated
E5	Quantity and present condition of the water supply facilities:	1 deteriorated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	1 deteriorated
E7	Quantity and present condition of the water supply facilities: net/distribution pipes	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	deteriorated
E9	Quantity and present condition of the water supply facilities: pump	absent
E10	Who is the owner of the water supply facilities?	community
E11	Who is engaged in the water supply facilities repairing works?	residents
E12	How do you repair the water supply facilities?	hired specialist
E13	Who is in charge of the repair work in the community?	specialist in the community with fee
E14	How you prepare O&M costs?	community budget
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	100,000
	Repair cost(AMD)	700,000
	Others(AMD)	0
	Total (AMD)	800,000
E16	Do the residents participate in the O&M works?	DRR cleaning, earthwork
E17	What kind of OM method is preferable to you?	water fee
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	yes
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
11050	150	Steel
DISTRIBUTION PIPELINE		
4000	150	Steel
800	125	
7550	100	

	N	E	H (m)
A	40°29′24.7″	44°16′06.8″	2451
B	40°29′21.4″	44°17′10.4″	2314
C	40°28′48.3″	44°21′46.9″	1961

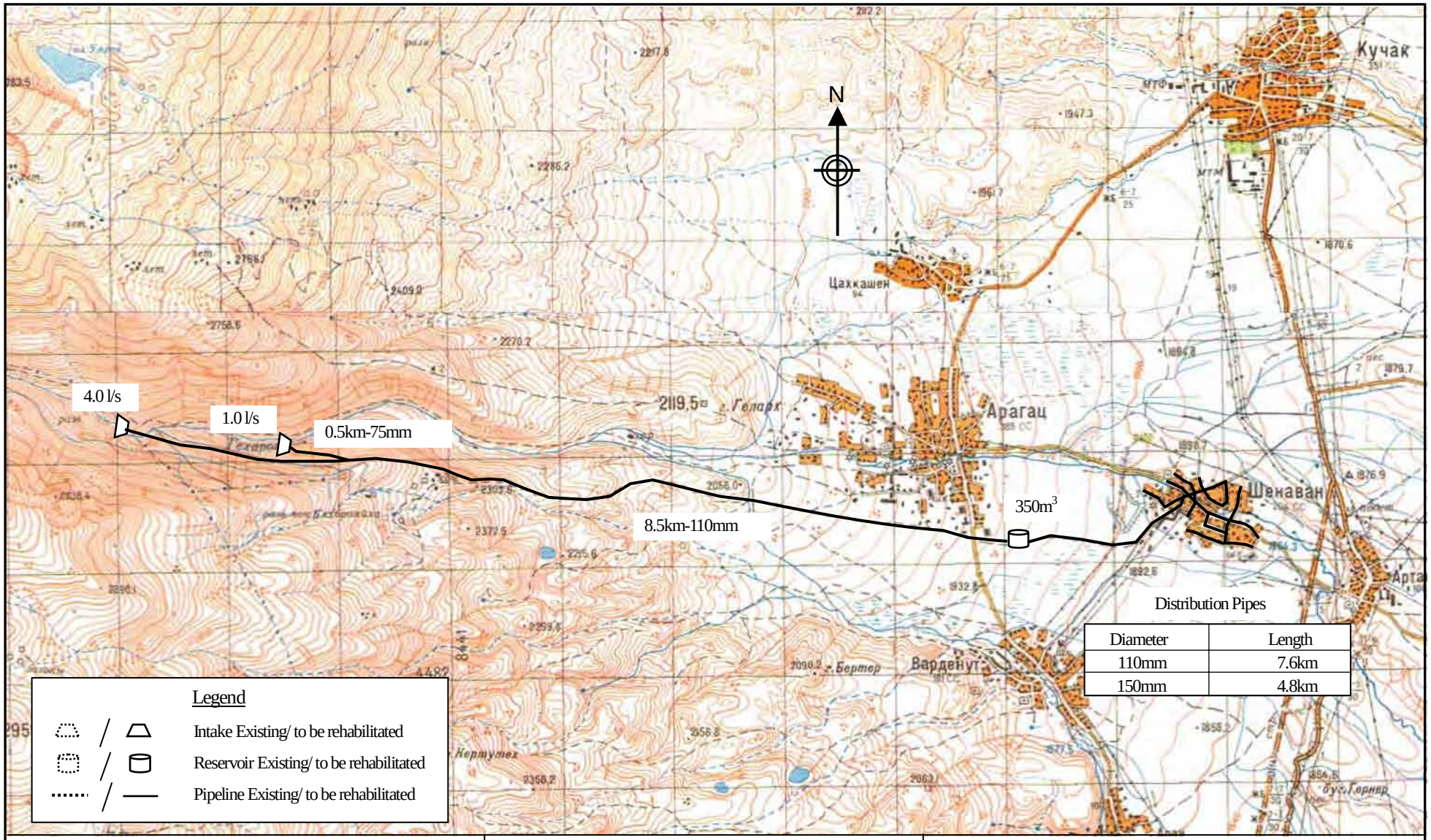
Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
49	Shenavan	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.49
Name : **Shenavan**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	1,700	persons	170.0	
	2 Factory	-	nos	0.0	
	3 School (pupils)	400	pupils	4.0	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	378	household	32.9	
	Sub-total			206.9	
	Unaccouted for water (20%)			41.4	
1	Average Daily Water Demand		146.3	248.3	m3/day
2	Maximum Daily Water Demand			297.9	m3/day
3	Maximum Hourly Water Demand			29.0	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	2	5.0	lit/sec		432.0	m3/day
`	Total					432.0	m3/day
	2 Required reservoir volume					349	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**		
	No Item	Quantity	Unit
	1 Intake		
	1m3	2	nos
	2m3		nos
	3m3		nos
	4m3		nos
	2 Transmission pipe		
	50mm diameter		m
	75mm diameter	500	m
	90mm diameter		m
	110mm diameter	8,500	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
	3 Reservoir		
	350m3 capacity	1	nos
	4 Distribution pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	7,600	m
	150mm diameter	4,800	m
	200mm diameter		m
	250mm diameter		m
	5 House connection	-	nos
	6 Water meter installation	378	nos
	7 Public tap	4	nos
	8 Chlorination	1	nos
	9 Pumps	-	nos



Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Aragatsotn	
No. 49	Shenavan	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **49**
Name : **Shenavan**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	2	nos	367,700	735,400
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					735,400
2	Transmission Pipe					
		50mm		m	5,520	
		75mm	500	m	7,160	3,580,000
		90mm		m	8,040	
		110mm	8,500	m	9,680	82,280,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					85,860,000
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3		nos	18,804,500	
		200m3		nos	22,524,600	
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3	1	nos	33,528,700	33,528,700
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					33,528,700
4	Distribution Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	7,600	m	9,680	73,568,000
		150mm	4,800	m	13,140	63,072,000
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					136,640,000
5	House Connection			nos	74,000	
6	Water Meter Installation		378	nos	80,000	30,240,000
7	Public Tap		4	nos	90,000	360,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	4,960	m	3,600	17,856,000
	Total				AMD	305,720,100
					Equivalent to USD	1,000,655
					Equivalent to JPY	105,569,097
					AMD	USD
	Investment Cost per household		378	HH	808,783	2,647
	Investment Cost per person		1,700	persons	179,835	589

ARAGATSOTN MARZ
Aparan District
No 49 Shenavan

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		75.5																																							
Unit rate	AMD/m3				40.00	40.00	40.00	41.32	70.00	72.31	74.70	77.16	115.65	119.47	123.41	127.48	131.69	136.03	140.52	145.16	149.95	154.90	160.01	165.29	170.75	176.38	182.20	188.21	194.42	200.84	207.47	214.31	221.39	228.69	236.24	244.04	252.09	260.41	269.00	277.88	287.05	296.52
Sub-total		421.54	0.00	0.00	1.11	2.23	2.72	2.81	4.76	4.91	5.08	5.24	7.86	8.12	8.39	8.66	8.95	9.25	9.55	9.87	10.19	10.53	10.88	11.23	11.61	11.99	12.38	12.79	13.21	13.65	14.10	14.57	15.05	15.54	16.06	16.59	17.13	17.70	18.28	18.89	19.51	20.15
B Operating Costs																																									
1. Staff salary																																									
Inspectors	person				1																																				
Pump operators	person				0																																				
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		17.70			0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.51	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80
2. Chlorine																																									
Pouring volume	kg/yr				454																																				
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		19.88			0.11	0.23	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.50	0.52	0.54	0.56	0.57	0.59	0.61	0.63	0.65	0.68	0.70	0.72	0.75	0.77	0.80	0.82	0.85	0.88	0.91
3. Electricity (for pump)		0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Maintenance cost		59.83			0.34	0.69	0.88	0.90	0.93	0.96	1.00	1.03	1.06	1.10	1.13	1.17	1.21	1.25	1.29	1.33	1.38	1.42	1.47	1.52	1.57	1.62	1.68	1.73	1.79	1.85	1.91	1.97	2.04	2.10	2.17	2.24	2.32	2.39	2.47	2.55	2.64	2.73
Pump repair					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe repair					0.34	0.69	0.88	0.90	0.93	0.96	1.00	1.03	1.06	1.10	1.13	1.17	1.21	1.25	1.29	1.33	1.38	1.42	1.47	1.52	1.57	1.62	1.68	1.73	1.79	1.85	1.91	1.97	2.04	2.10	2.17	2.24	2.32	2.39	2.47	2.55	2.64	2.73
5. Pump replacement		0.00																0.00															0.00									
Sub-total		97.41	0.00	0.00	0.69	1.17	1.43	1.46	1.51	1.56	1.62	1.67	1.72	1.79	1.84	1.90	1.96	2.04	2.10	2.16	2.24	2.31	2.39	2.46	2.55	2.63	2.73	2.81	2.90	3.00	3.10	3.20	3.32	3.42	3.53	3.65	3.77	3.89	4.01	4.15	4.29	4.44
C Gross Income (A-B)		324.13	0.00	0.00	0.42	1.06	1.29	1.35	3.25	3.35	3.46	3.57	6.14	6.33	6.55	6.76	6.99	7.21	7.45	7.71	7.95	8.22	8.49	8.77	9.06	9.36	9.65	9.98	10.31	10.65	11.00	11.37	11.73	12.12	12.53	12.94	13.36	13.81	14.27	14.74	15.22	15.71
D Depreciation cost		290.50						8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30
E Interest paid		87.53	0.02	0.04	1.51	3.03	3.72	3.73	3.73	3.73	3.73	3.73	3.73	3.62	3.51	3.40	3.29	3.18	3.07	2.96	2.84	2.72	2.61	2.49	2.37	2.25	2.13	2.00	1.88	1.75	1.63	1.50	1.37	1.24	1.11	0.97	0.84	0.70	0.56	0.42	0.28	0.14
F Net Income		-53.90	-0.02	-0.04	-1.09	-1.97	-2.43	-10.68	-8.78	-8.68	-8.57	-8.46	-5.89	-5.59	-5.26	-4.94	-4.60	-4.27	-3.92	-3.55	-3.19	-2.80	-2.42	-2.02	-1.61	-1.19	-0.78	-0.32	0.13	0.60	1.07	1.57	2.06	2.58	3.12	3.67	4.22	4.81	5.41	6.02	6.64	7.27
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		-53.90	-0.02	-0.04	-1.09	-1.97	-2.43	-10.68	-8.78	-8.68	-8.57	-8.46	-5.89	-5.59	-5.26	-4.94	-4.60	-4.27	-3.92	-3.55	-3.19	-2.80	-2.42	-2.02	-1.61	-1.19	-0.78	-0.32	0.13	0.60	1.07	1.57	2.06	2.58	3.12	3.67	4.22	4.81	5.41	6.02	6.64	7.27
OM Cost Recovery Ratio (A/B)		433%	0%	0%	161%	191%	190%	192%	315%	315%	314%	314%	457%	454%	456%	456%	457%	453%	455%	457%	455%	456%	455%	457%	455%	456%	453%	455%	456%	455%	455%	455%	453%	454%	455%	455%	454%	455%	456%	455%	455%	454%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	-53.90	-0.02	-0.04	-1.09	-1.97	-2.43	-10.68	-8.78	-8.68	-8.57	-8.46	-5.89	-5.59	-5.26	-4.94	-4.60	-4.27	-3.92	-3.55	-3.19	-2.80	-2.42	-2.02	-1.61	-1.19	-0.78	-0.32	0.13	0.60	1.07	1.57	2.06	2.58	3.12	3.67	4.22	4.81	5.41	6.02	6.64	7.27
2. Depreciation cost	290.50	0.00	0.00	0.00	0.00	0.00	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30
3. Interest Paid	87.53	0.02	0.04	1.51	3.03	3.72	3.73	3.73	3.73	3.73	3.73	3.73	3.62	3.51	3.40	3.29	3.18	3.07	2.96	2.84	2.72	2.61	2.49	2.37	2.25	2.13	2.00	1.88	1.75	1.63	1.50	1.37	1.24	1.11	0.97	0.84	0.70	0.56	0.42	0.28	0.14
Sub-total	324.13	0.00	0.00	0.42	1.06	1.29	1.35	3.25	3.35	3.46	3.57	6.14	6.33	6.55	6.76	6.99	7.21	7.45	7.71	7.95	8.22	8.49	8.77	9.06	9.36	9.65	9.98	10.31	10.65	11.00	11.37	11.73	12.12	12.53	12.94	13.36	13.81	14.27	14.74	15.22	15.71
B Finances																																									
1. Project Loan	372.88	2.36	1.67	147.28	152.00	68.93	0.36	0.28																																	
2. Local fund	127.63	0.79	0.56	49.90	52.19	23.98	0.12	0.09																																	
Sub-total	500.51	3.15	2.23	197.18	204.19	92.91	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	138.60	0.02	0.04	1.09	1.97	2.43	2.38	0.48	0.38	0.27	0.16	8.31	8.12	7.89	7.68	7.45	7.24	7.00	6.74	6.50	6.22	5.96	5.68	5.39	5.09	4.80	4.46	4.14	3.80	3.45	3.08	2.72	2.33	1.92	1.51	1.09	0.64	0.17	0.00	0.00	0.00
Sub-total	138.60	0.02	0.04	1.09	1.97	2.43	2.38	0.48	0.38	0.27	0.16	8.31	8.12	7.89	7.68	7.45	7.24	7.00	6.74	6.50	6.22	5.96	5.68	5.39	5.09	4.80	4.46	4.14	3.80	3.45	3.08	2.72	2.33	1.92	1.51	1.09	0.64	0.17	0.00	0.00	0.00
Total Cash Inflow	963.24	3.17	2.27	198.69	207.22	96.63	4.21	4.10	3.73	3.73	3.73	14.45	14.45	14.44	14.44	14.44	14.45	14.45	14.45	14.45	14.44	14.45	14.45	14.45	14.45	14.45	14.44	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.44	14.74	15.22	15.71
APPLICATION OF FUNDS																																								
D Project disbursement	500.51	3.15	2.23	197.18	204.19	92.91	0.48	0.37																																	
E Total debt services																																								
1. Loan repayment	372.86											10.72	10.83	10.93	11.04	11.15	11.27	11.38	11.49	11.61	11.72	11.84	11.96	12.08	12.20	12.32	12.44	12.57	12.70	12.82	12.95	13.08	13.21	13.34	13.48	13.61	13.75	13.88	14.02	14.16	14.31
2. Interest paid	87.53	0.02	0.04	1.51	3.03	3.72	3.73	3.73	3.73	3.73	3.73	3.73	3.62	3.51	3.40	3.29	3.18	3.07	2.96	2.84	2.72	2.61	2.49	2.37	2.25	2.13	2.00	1.88	1.75	1.63	1.50	1.37	1.24	1.11	0.97	0.84	0.70	0.56	0.42	0.28	0.14
Sub-total	460.39	0.02	0.04	1.51	3.03	3.72	3.73	3.73	3.73	3.73	3.73	14.45	14.45	14.44	14.44	14.44	14.45	14.45	14.45	14.45	14.44	14.45	14.45	14.45	14.45	14.45	14.44	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.44	14.44	14.44	14.44	14.45
Total Cash Outflow	960.90	3.17	2.27	198.69	207.22	96.63	4.21	4.10	3.73	3.73	3.73	14.45	14.45	14.44	14.44	14.44	14.45	14.45	14.45	14.45	14.44	14.45	14.45	14.45	14.45	14.45	14.44	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.44	14.44	14.44	14.44	14.45
F Net Surplus Cash (A+C2)-E	2.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.78	1.26	
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	70%	0%	0%	28%	35%	35%	36%	87%	90%	93%	96%	42%	44%	45%	47%	48%	50%	52%	53%	55%	57%	59%	61%	63%	65%	67%	69%	71%	74%	76%	79%	81%	84%	87%	90%	92%	96%	99%	102%	105%	109%
Cost recovery by water fee + subsidy ((A+C2)/E)	101%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	102%	105%	109%

ARAGATSOTN MARZ
Aparan District
No 49 Shenavan

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	421.54	75.3%
	Subsidy	138.60	24.7%
	Total	560.14	100.0%
2	**Expenditure**		
	OM cost	97.41	17.4%
	Loan repayment	372.86	66.6%
	Interest paid	87.53	15.6%
	Surplus cash	2.34	0.4%
	Total	560.14	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																								
1. Investment Cost	332.47	2.30	1.64	134.37	134.42	59.15	0.33	0.26																																
2. Operation and Maintenance Cost																																								
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	10.42			0.11	0.23	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Electricity	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mantenance cost	30.53			0.34	0.67	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Pump replacement																	0.00															0.00									
Sub-total	50.07			0.69	1.14	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
Total Outflow	382.54	2.30	1.64	135.06	135.56	60.49	1.67	1.60	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
B BENEFIT																																								
1. Water Tariff	264.66	0.00	0.00	1.11	2.23	2.72	2.81	4.76	4.91	5.08	5.24	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86
2. Subsidy	70.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.58	4.50	4.38	4.28	4.16	4.06	3.93	3.78	3.66	3.50	3.35	3.19	3.02	2.84	2.67	2.46	2.26	2.05	1.82	1.58	1.35	1.09	0.81	0.54	0.25	0.00	0.00	0.00	0.00
Total Inflow	334.77	0.00	0.00	1.11	2.23	2.72	2.81	4.76	4.91	5.08	5.24	12.44	12.36	12.24	12.14	12.02	11.92	11.79	11.64	11.52	11.36	11.21	11.05	10.88	10.70	10.53	10.32	10.12	9.91	9.68	9.44	9.21	8.95	8.67	8.40	8.11	7.86	7.86	7.86	7.86
NET BENEFIT	-47.77	-2.30	-1.64	-134.0	-133.3	-57.8	1.14	3.16	3.57	3.74	3.90	11.10	11.02	10.90	10.80	10.68	10.58	10.45	10.30	10.18	10.02	9.87	9.71	9.54	9.36	9.19	8.98	8.78	8.57	8.34	8.10	7.87	7.61	7.33	7.06	6.77	6.52	6.52	6.52	6.52	6.52

FIRR = **-0.79%**

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-148.92	-2.53	-1.80	-147.4	-146.8	-63.7	1.11	3.13	3.57	3.74	3.90	11.10	11.02	10.90	10.80	10.68	10.58	10.45	10.30	10.18	10.02	9.87	9.71	9.54	9.36	9.19	8.98	8.78	8.57	8.34	8.10	7.87	7.61	7.33	7.06	6.77	6.52	6.52	6.52	6.52
	2	Capital cost 20% up	-180.08	-2.76	-1.97	-160.8	-160.2	-69.6	1.07	3.11	3.57	3.74	3.90	11.10	11.02	10.90	10.80	10.68	10.58	10.45	10.30	10.18	10.02	9.87	9.71	9.54	9.36	9.19	8.98	8.78	8.57	8.34	8.10	7.87	7.61	7.33	7.06	6.77	6.52	6.52	6.52	6.52
2	1	OM cost 10% up	-121.25	-2.30	-1.64	-134.0	-133.4	-57.9	1.01	3.03	3.44	3.61	3.77	10.97	10.89	10.77	10.67	10.55	10.45	10.32	10.17	10.05	9.89	9.74	9.58	9.41	9.23	9.06	8.85	8.65	8.44	8.21	7.97	7.74	7.48	7.20	6.93	6.64	6.39	6.39	6.39	6.39
	2	OM cost 20% up	-124.74	-2.30	-1.64	-134.1	-133.6	-58.0	0.87	2.89	3.30	3.47	3.63	10.83	10.75	10.63	10.53	10.41	10.31	10.18	10.03	9.91	9.75	9.60	9.44	9.27	9.09	8.92	8.71	8.51	8.30	8.07	7.83	7.60	7.34	7.06	6.79	6.50	6.25	6.25	6.25	6.25
3	1	Revenue 10% down	-140.63	-2.30	-1.64	-134.1	-133.6	-58.0	0.86	2.68	3.08	3.23	3.38	9.86	9.78	9.68	9.59	9.48	9.39	9.27	9.14	9.03	8.88	8.75	8.61	8.45	8.29	8.14	7.95	7.77	7.58	7.37	7.16	6.95	6.72	6.46	6.22	5.96	5.73	5.73	5.73	5.73
	2	Revenue 20% down	-163.51	-2.30	-1.64	-134.2	-133.8	-58.3	0.58	2.21	2.59	2.72	2.85	8.61	8.55	8.45	8.37	8.28	8.20	8.09	7.97	7.88	7.75	7.63	7.50	7.36	7.22	7.08	6.92	6.76	6.59	6.40	6.21	6.03	5.82	5.60	5.38	5.15	4.95	4.95	4.95	4.95

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-1.27%	-3.73	-26.83%
	2	Capital cost 20% up	-1.69%	-5.29	-18.89%
2	1	OM cost 10% up	-0.88%	-1.00	-100.22%
	2	OM cost 20% up	-0.97%	-1.82	-54.85%
3	1	Revenue 10% down	-1.41%	-4.37	-22.89%
	2	Revenue 20% down	-2.09%	-6.20	-16.13%

No.50 Shgharshik

Information on Existing Water Sources (Aragatsotn)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.50 Community Shgharshik
District Talin
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Ulubulagh spring	40	24	44.0	43	58	36.0	2,039	5.0	20.0	8.0
2	Garnaghbyuz spring	40	24	27.6	43	58	47.0	2,026	2.0	5.0	3.0
3	Inter comm. Spring	40	24	38.9	43	57	59.4	1,999	3.0	10.0	6.0
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Not acceptable
Notes	Spring intakes are in deteriorated condition, there are leakages. Transmission pipelines are also deteriorated. Rural community feels poor wter quality.
Alternative sources if any	The community has a prospective source, which cannot use in dry season.

No.50 Community Shgharshik
District Talin
Marz Aragatsotn
Sampling date 30/Aug/2007

	Parameters analysed	Units	No.1 Ulu bulakh	No.2 Hushardzani aghbyur			Guidelines	
							WHO	Armenia
a	pH		7.8	7.7			6.5-8	6.0 - 9.0
b	Temperature	Deg.C	6.7	8.8				
c	TDS	Mg/L	30	84			1000	1000
1	Al:Aluminum	Mg/L	n.d	n.d			0.10	0.50
2	B:Boron	Mg/L	n.d	n.d			0.70	0.50
3	Cl:Chloride	Mg/L	4	6			250	350
4	Cr:Chrome	Mg/L	<0.01	<0.01			0.05	0.05
5	Cu:Copper	Mg/L	n.d	n.d			2	1
6	F:Fluoride	Mg/L	0.09	0.18			1.50	
7	Hardness	Mg/L	70	190			500	700
8	Fe:Iron	Mg/L	n.d	n.d			0.30	0.30
9	Mn:Manganese	Mg/L	n.d	n.d			0.40	0.10
10	Mo:Molibdenum	Mg/L	<0.02	0.020			0.070	0.250
11	Ni:Nickel	Mg/L	<0.006	<0.006			0.020	0.100
12	Nitrate(NO3+)	Mg/L	1.3	3.0			50.0	45.0
13	SO4:Sulfate	Mg/L	3.0	4.0			250.0	500.0
14	Zn:Zink	Mg/L	n.d	n.d			3.0	5.0
15	As:Arsenic	Mg/L	n.d	n.d			0.0	0.1
16	Ba:Barium	Mg/L	<0.01	<0.01			0.70	0.10
17	Be:Berillium	Mg/L	n.d	n.d			NA	0.00020
18	Cd:Cadmium	Mg/L	<0.0001	<0.0001			0.0030	0.0010
19	Pb:Lead	Mg/L	<0.001	<0.001			0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002	<0.0002			0.00100	0.00050
21	Se:Selenium	Mg/L	n.d	n.d			0.010	0.010
22	Sr:Strontium	Mg/L	n.d	n.d			NA	7.0
23	CN:Cyanide	Mg/L	n.d	n.d			0.070	0.035
24	Coli form bacteria	bacteria per 100 ml					-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml					0	0
26	Total bacteria	bacteria per 1 ml					-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.50 Community Shgharshik
District Talin
Marz Aragatsotn

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not Identified	Not Identified
1	1		208	21.0	Not Identified
2	2		212	21.0	Not Identified
3	3		210	21.0	Not Identified
4	4		206	21.0	Not Identified
5	5		209	21.0	Not Identified
6	6		210	21.0	Not Identified
7	7		208	21.0	Not Identified
8	8		207	21.0	Not Identified
			137		Not Identified

No. **50** **Marz** Aragatsotn **Community** Shgarshik

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Possible	Possible	
2	Intake	Possible	Possible	
3	Transmission pipeline	Possible	Possible	Pipeline is mostly far from the road
4	Reservoir			No reservoir

2. INTAKE STRUCTURE

No.	Water main	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°24'44.0″	43°58'36.0″	2,039	1950	reinforced concrete	8.0	Yes
2	Spring	40°24'27,6″	43°58'47,0″	2,026	2000	reinforced concrete	3.0	Yes
3	Spring	40°24'38,9″	43°57'59,4″	1,999	1994	Masonry	6.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	2,000	200	AsbestosCement	4.0	1950	Medium	Yes
2	1,500	150	Steel	1.6	2000	Medium	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	No							

5. CHLORINATION EQUIPMENT

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	Yes	Intake	Powder	Once a year

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	500	200	AsbestosCement	1973	Medium	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
No							

8. PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
5	1973	1994	No	0	Yes

9. DRAINAGE SYSTEM

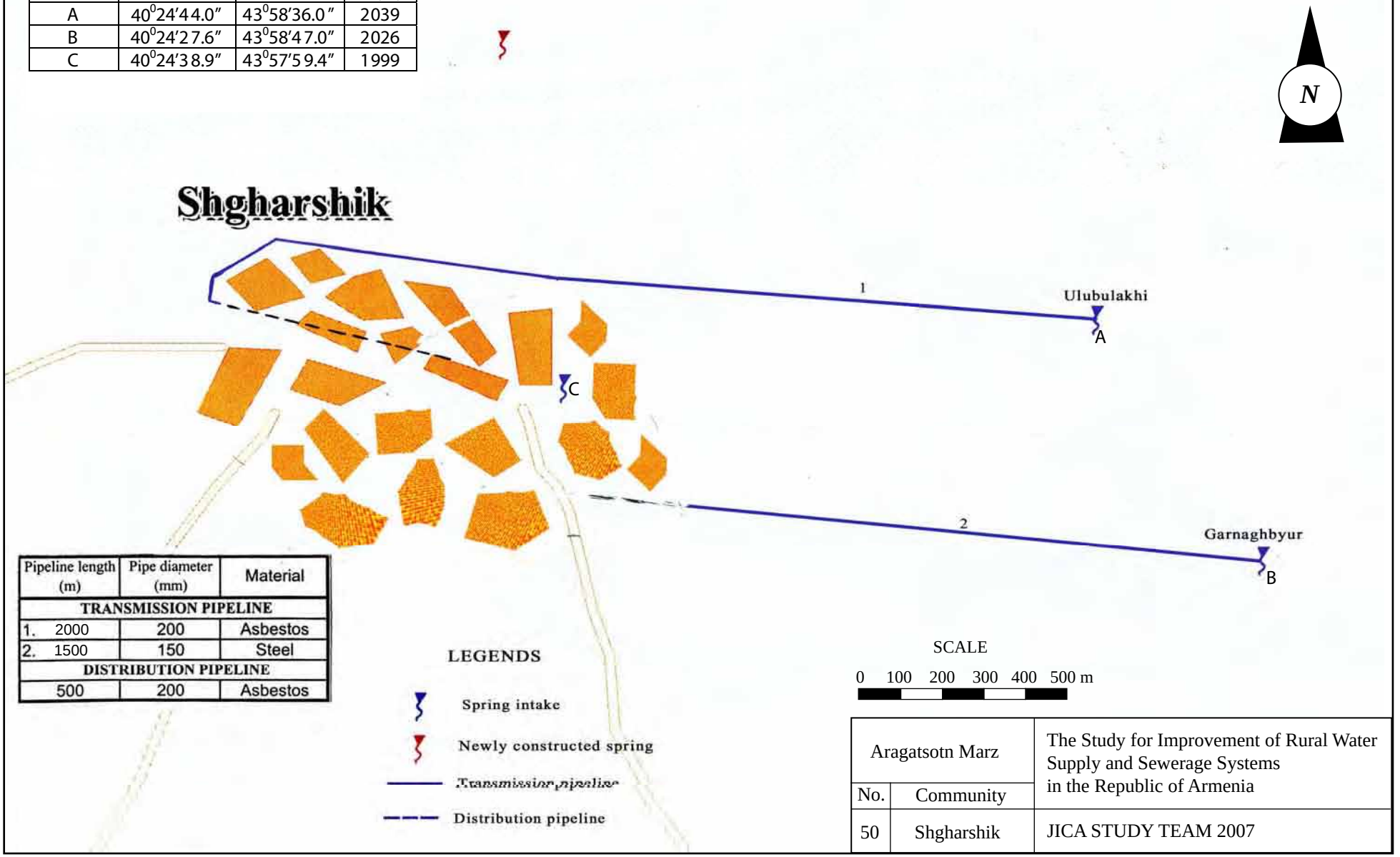
Existence (Y/N)	Rehabilitation Necessity (Y/N)	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.50 Shgharshik**
District	**Talin**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	510
A2	Actual population in 2007	540
A3	Number of households	200
A4.1	Elderly people	70
A4.2	Population in labor force (age from 16 to 62)	330
A4.3	Children	140
A5.1	Pensioners	80
A5.2	Unemployed	0
A5.3	Receiving benefits	35
A6	Average monthly income of household (AMD)	25,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	120
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	1,250
	Annual Budget of the community 2005, in thousand AMD	1,300
	Annual Budget of the community 2006, in thousand AMD	1,500
	Annual Budget of the community 2007, in thousand AMD	1,500
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	800
	Amount spent in drinking water sector 2005, in thousand AMD	900
	Amount spent in drinking water sector 2006, in thousand AMD	100
	Amount spent in drinking water sector 2007, in thousand AMD	120
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned.
C: Socio-Economic Survey		
C1	Major industries of the community:	dairy, meat, wool
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1-Yes, 2-No	no
D2	Water use permit number	-
D3	Date of expiry of water use permit	-
D4	Planned date of obtaining water use permit	is not planned
D5	Present condition of the water supply volume of Domestic use	insufficient
D6	Present condition of the water supply volume of Irrigation water	almost sufficient
D7	Number of house connection to drinking water system	70
D8	How many house connection household set the water meter	0
D9	Number of public taps	40 yard tap
D10.1	How is the regime of water supply in your community in the dry season?	24 hrs
D10.2	How is the regime of water supply in your community in the wet season?	24 hrs
D11	What time of day water is given?	-
D12	Are you pleased with duration of domestic water supply?	very pleased
D13	Are hours of water supply convenient?	-
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	100
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	200
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1Flate rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	spring
D20	Are you satisfied with irrigation water supply volume?	almost sufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Avushyan Soybab
E2	Position	water distributor
E3	Telephone	with the help of administration head
E4	Quantity and present condition of the water supply facilities: spring/ intake	1 deteriorated
E5	Quantity and present condition of the water supply facilities:	1 deteriorated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	absent
E7	Quantity and present condition of the water supply facilities: net/distribution pipes	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	deteriorated
E9	Quantity and present condition of the water supply facilities: pump	absent
E10	Who is the owner of the water supply facilities?	community
E11	Who is engaged in the water supply facilities repairing works?	residents
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	administration head
E14	How you prepare O&M costs?	community budget
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	120,000
	Repair cost(AMD)	0
	Others(AMD)	0
	Total (AMD)	120,000
E16	Do the residents participate in the O&M works?	earthwork, welding
E17	What kind of OM method is preferable to you?	as manpower, reduce water fee
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent

	N	E	H (m)
A	40°24′44.0″	43°58′36.0″	2039
B	40°24′27.6″	43°58′47.0″	2026
C	40°24′38.9″	43°57′59.4″	1999



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
1. 2000	200	Asbestos
2. 1500	150	Steel
DISTRIBUTION PIPELINE		
500	200	Asbestos

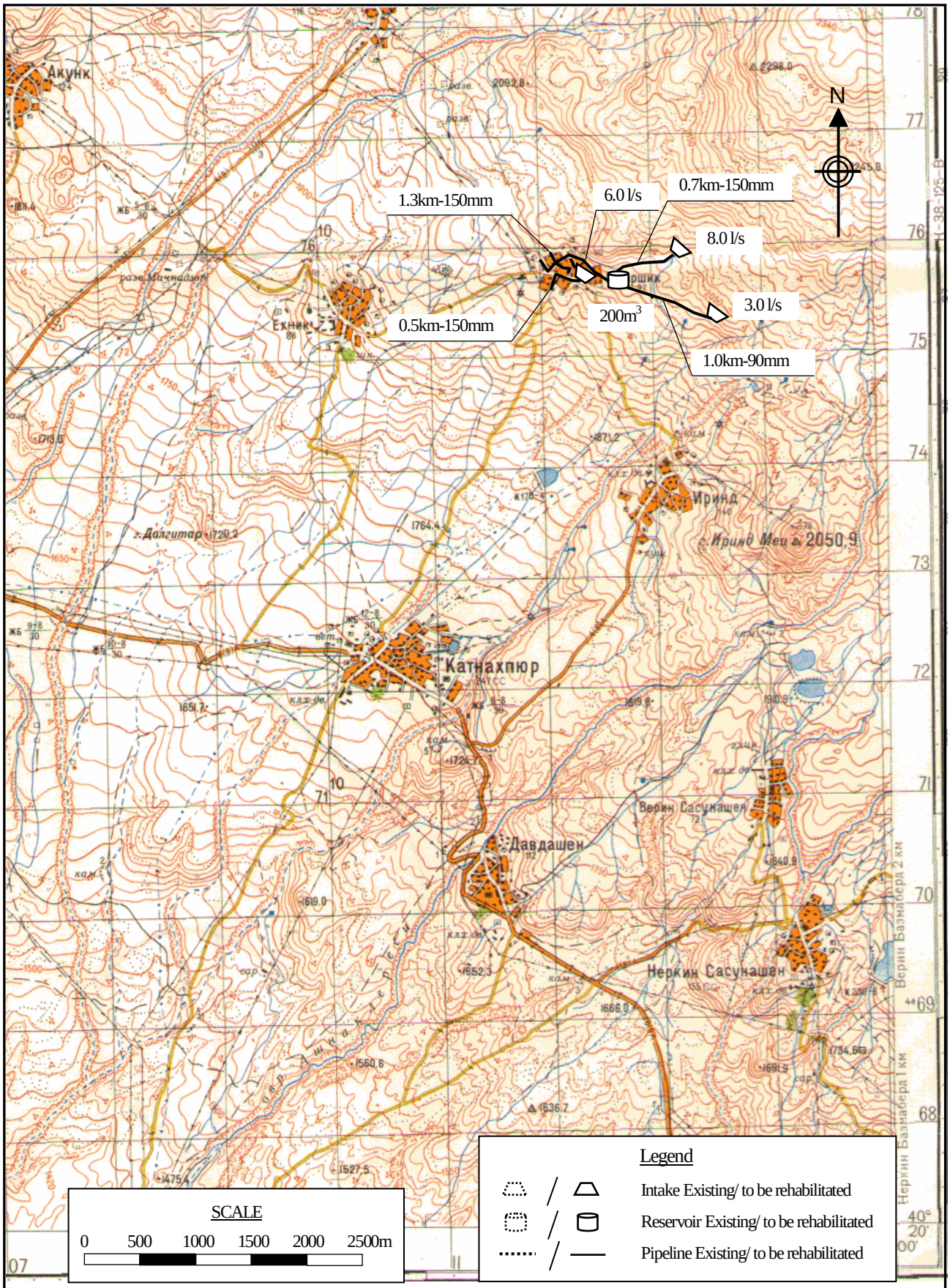
Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
50	Shgharshik	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.50
Name : **Shgharshik**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	540	persons	54.0	
	2 Factory	-	nos	0.0	
	3 School (pupils)	120	pupils	1.2	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	200	household	17.4	
	Sub-total			72.6	
	Unaccouted for water (20%)			14.5	
1	Average Daily Water Demand			87.1	m3/day
2	Maximum Daily Water Demand			104.5	m3/day
3	Maximum Hourly Water Demand			14.2	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	3	17.0	lit/sec		1,468.8	m3/day
`	Total					1,468.8	m3/day
	2 Required reservoir volume					170	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**		
No	Item	Quantity	Unit
1	Intake		
	1m3	3	nos
	2m3		nos
	3m3		nos
	4m3		nos
2	Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter	1,000	m
	110mm diameter		m
	150mm diameter	700	m
	200mm diameter		m
	250mm diameter		m
3	Reservoir		
	200m3 capacity	1	nos
4	Distribution pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter		m
	150mm diameter	1,800	m
	200mm diameter		m
	250mm diameter		m
5	House connection	130	nos
6	Water meter installation	200	nos
7	Public tap	2	nos
8	Chlorination	1	nos
9	Pumps	-	nos



Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Aragatsotn	
No. 50	Shgharshik	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **50**
Name : **Shgharshik**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	3	nos	367,700	1,103,100
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					1,103,100
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm	1,000	m	8,040	8,040,000
		110mm		m	9,680	
		150mm	700	m	13,140	9,198,000
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					17,238,000
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3		nos	18,804,500	
		200m3	1	nos	22,524,600	22,524,600
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					22,524,600
4	Distribution Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm	1,800	m	13,140	23,652,000
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					23,652,000
5	House Connection		130	nos	74,000	9,620,000
6	Water Meter Installation		200	nos	80,000	16,000,000
7	Public Tap		2	nos	90,000	180,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	720	m	3,600	2,592,000
	Total				AMD	93,409,700
					Equivalent to USD	305,740
					Equivalent to JPY	32,255,575
					AMD	USD
	Investment Cost per household		200	HH	467,049	1,529
	Investment Cost per person		540	persons	172,981	566

ARAGATSOTN MARZ
Talin District
No 50 Shgharshik

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		26.5																																							
Unit rate	AMD/m3				40.00	40.00	40.00	41.32	70.00	72.31	74.70	77.16	115.65	119.47	123.41	127.48	131.69	136.03	140.52	145.16	149.95	154.90	160.01	165.29	170.75	176.38	182.20	188.21	194.42	200.84	207.47	214.31	221.39	228.69	236.24	244.04	252.09	260.41	269.00	277.88	287.05	296.52
Sub-total		148.00	0.00	0.00	0.42	0.84	0.95	0.99	1.67	1.72	1.78	1.84	2.76	2.85	2.94	3.04	3.14	3.24	3.35	3.46	3.58	3.69	3.82	3.94	4.07	4.21	4.35	4.49	4.64	4.79	4.95	5.11	5.28	5.45	5.63	5.82	6.01	6.21	6.42	6.63	6.85	7.07
B Operating Costs																																									
1. Staff salary																																									
Inspectors	person				1																																				
Pump operators	person				0																																				
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		17.70			0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.51	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80
2. Chlorine																																									
Pouring volume	kg/yr				159																																				
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		6.99			0.04	0.09	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32
3. Electricity (for pump)		0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Maintenance cost		10.27			0.06	0.13	0.15	0.15	0.16	0.16	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.40	0.41	0.42	0.44	0.45	0.47
Pump repair					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe repair					0.06	0.13	0.15	0.15	0.16	0.16	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.40	0.41	0.42	0.44	0.45	0.47
5. Pump replacement		0.00																0.00															0.00									
Sub-total		34.96	0.00	0.00	0.34	0.47	0.51	0.52	0.54	0.55	0.58	0.60	0.61	0.64	0.65	0.68	0.70	0.73	0.75	0.78	0.80	0.83	0.85	0.88	0.91	0.94	0.97	1.01	1.04	1.07	1.11	1.15	1.19	1.22	1.26	1.30	1.35	1.39	1.43	1.49	1.53	1.59
C Gross Income (A-B)		113.04	0.00	0.00	0.08	0.37	0.44	0.47	1.13	1.17	1.20	1.24	2.15	2.21	2.29	2.36	2.44	2.51	2.60	2.68	2.78	2.86	2.97	3.06	3.16	3.27	3.38	3.48	3.60	3.72	3.84	3.96	4.09	4.23	4.37	4.52	4.66	4.82	4.99	5.14	5.32	5.48
D Depreciation cost		88.90						2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
E Interest paid		28.48	0.02	0.04	0.53	1.05	1.19	1.21	1.21	1.21	1.21	1.21	1.21	1.17	1.14	1.10	1.06	1.03	0.99	0.96	0.92	0.88	0.84	0.80	0.77	0.73	0.69	0.65	0.61	0.57	0.53	0.48	0.44	0.40	0.36	0.31	0.27	0.23	0.18	0.14	0.09	0.05
F Net Income		-4.34	-0.02	-0.04	-0.45	-0.68	-0.75	-3.28	-2.62	-2.58	-2.55	-2.51	-1.60	-1.50	-1.39	-1.28	-1.16	-1.06	-0.93	-0.82	-0.68	-0.56	-0.41	-0.28	-0.15	0.00	0.15	0.29	0.45	0.61	0.77	0.94	1.11	1.29	1.47	1.67	1.85	2.05	2.27	2.46	2.69	2.89
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		-4.34	-0.02	-0.04	-0.45	-0.68	-0.75	-3.28	-2.62	-2.58	-2.55	-2.51	-1.60	-1.50	-1.39	-1.28	-1.16	-1.06	-0.93	-0.82	-0.68	-0.56	-0.41	-0.28	-0.15	0.00	0.15	0.29	0.45	0.61	0.77	0.94	1.11	1.29	1.47	1.67	1.85	2.05	2.27	2.46	2.69	2.89
OM Cost Recovery Ratio (A/B)		423%	0%	0%	122%	179%	186%	190%	309%	313%	307%	307%	452%	445%	452%	447%	449%	444%	447%	444%	448%	445%	449%	448%	447%	448%	448%	445%	446%	448%	446%	444%	444%	447%	447%	448%	445%	447%	449%	445%	448%	445%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	-4.34	-0.02	-0.04	-0.45	-0.68	-0.75	-3.28	-2.62	-2.58	-2.55	-2.51	-1.60	-1.50	-1.39	-1.28	-1.16	-1.06	-0.93	-0.82	-0.68	-0.56	-0.41	-0.28	-0.15	0.00	0.15	0.29	0.45	0.61	0.77	0.94	1.11	1.29	1.47	1.67	1.85	2.05	2.27	2.46	2.69	2.89
2. Depreciation cost	88.90	0.00	0.00	0.00	0.00	0.00	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
3. Interest Paid	28.48	0.02	0.04	0.53	1.05	1.19	1.21	1.21	1.21	1.21	1.21	1.21	1.17	1.14	1.10	1.06	1.03	0.99	0.96	0.92	0.88	0.84	0.80	0.77	0.73	0.69	0.65	0.61	0.57	0.53	0.48	0.44	0.40	0.36	0.31	0.27	0.23	0.18	0.14	0.09	0.05
Sub-total	113.04	0.00	0.00	0.08	0.37	0.44	0.47	1.13	1.17	1.20	1.24	2.15	2.21	2.29	2.36	2.44	2.51	2.60	2.68	2.78	2.86	2.97	3.06	3.16	3.27	3.38	3.48	3.60	3.72	3.84	3.96	4.09	4.23	4.37	4.52	4.66	4.82	4.99	5.14	5.32	5.48
B Finances																																									
1. Project Loan	120.51	2.36	1.67	49.79	51.24	14.81	0.36	0.28																																	
2. Local fund	41.16	0.79	0.56	16.86	17.58	5.16	0.12	0.09																																	
Sub-total	161.67	3.15	2.23	66.65	68.82	19.97	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	38.37	0.02	0.04	0.45	0.68	0.75	0.74	0.08	0.04	0.01	0.00	2.52	2.46	2.38	2.31	2.23	2.16	2.07	1.99	1.89	1.81	1.70	1.61	1.51	1.40	1.29	1.19	1.07	0.95	0.83	0.71	0.58	0.44	0.30	0.15	0.01	0.00	0.00	0.00	0.00	0.00
Sub-total	38.37	0.02	0.04	0.45	0.68	0.75	0.74	0.08	0.04	0.01	0.00	2.52	2.46	2.38	2.31	2.23	2.16	2.07	1.99	1.89	1.81	1.70	1.61	1.51	1.40	1.29	1.19	1.07	0.95	0.83	0.71	0.58	0.44	0.30	0.15	0.01	0.00	0.00	0.00	0.00	0.00
Total Cash Inflow	313.08	3.17	2.27	67.18	69.87	21.16	1.69	1.58	1.21	1.21	1.24	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.82	4.99	5.14	5.32	5.48
APPLICATION OF FUNDS																																								
D Project disbursement	161.67	3.15	2.23	66.65	68.82	19.97	0.48	0.37																																	
E Total debt services																																								
1. Loan repayment	120.50											3.46	3.50	3.53	3.57	3.61	3.64	3.68	3.71	3.75	3.79	3.83	3.87	3.90	3.94	3.98	4.02	4.06	4.10	4.14	4.19	4.23	4.27	4.31	4.36	4.40	4.44	4.49	4.53	4.58	4.62
2. Interest paid	28.48	0.02	0.04	0.53	1.05	1.19	1.21	1.21	1.21	1.21	1.21	1.21	1.17	1.14	1.10	1.06	1.03	0.99	0.96	0.92	0.88	0.84	0.80	0.77	0.73	0.69	0.65	0.61	0.57	0.53	0.48	0.44	0.40	0.36	0.31	0.27	0.23	0.18	0.14	0.09	0.05
Sub-total	148.98	0.02	0.04	0.53	1.05	1.19	1.21	1.21	1.21	1.21	1.21	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67
Total Cash Outflow	310.65	3.17	2.27	67.18	69.87	21.16	1.69	1.58	1.21	1.21	1.21	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67
F Net Surplus Cash (A+C2)-E	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.32	0.47	0.65	0.81
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	76%	0%	0%	14%	35%	37%	39%	93%	97%	99%	102%	46%	47%	49%	51%	52%	54%	56%	57%	60%	61%	64%	66%	68%	70%	72%	75%	77%	80%	82%	85%	88%	91%	94%	97%	100%	103%	107%	110%	114%	117%
Cost recovery by water fee + subsidy ((A+C2)/E)	102%	100%	100%	100%	100%	100%	100%	100%	100%	100%	102%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	103%	107%	110%	114%	117%

ARAGATSOTN MARZ
Talin District
No 50 Shgharshik

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	148.00	79.4%
	Subsidy	38.37	20.6%
	Total	186.37	100.0%
2	**Expenditure**		
	OM cost	34.96	18.8%
	Loan repayment	120.50	64.7%
	Interest paid	28.48	15.3%
	Surplus cash	2.43	1.3%
	Total	186.37	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																								
1. Investment Cost	108.12	2.30	1.64	45.47	45.37	12.75	0.33	0.26																																
2. Operation and Maintenance Cost																																								
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	3.73			0.04	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Electricity	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mantenance cost	5.22			0.06	0.12	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Pump replacement																	0.00															0.00									
Sub-total	18.08			0.34	0.45	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Total Outflow	126.20	2.30	1.64	45.81	45.82	13.23	0.81	0.74	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
B BENEFIT																																								
1. Water Tariff	93.01	0.00	0.00	0.42	0.84	0.95	0.99	1.67	1.72	1.78	1.84	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76
2. Subsidy	17.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.31	1.29	1.24	1.21	1.17	1.13	1.08	1.03	0.97	0.93	0.86	0.81	0.74	0.67	0.60	0.54	0.46	0.38	0.30	0.23	0.14	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Inflow	110.14	0.00	0.00	0.42	0.84	0.95	0.99	1.67	1.72	1.78	1.84	4.07	4.05	4.00	3.97	3.93	3.89	3.84	3.79	3.73	3.69	3.62	3.57	3.50	3.43	3.36	3.30	3.22	3.14	3.06	2.99	2.90	2.80	2.76	2.76	2.76	2.76	2.76	2.76	2.76
NET BENEFIT	-16.06	-2.30	-1.64	-45.4	-45.0	-12.3	0.18	0.93	1.24	1.30	1.36	3.59	3.57	3.52	3.49	3.45	3.41	3.36	3.31	3.25	3.21	3.14	3.09	3.02	2.95	2.88	2.82	2.74	2.66	2.58	2.51	2.42	2.32	2.28	2.28	2.28	2.28	2.28	2.28	2.28

FIRR = -0.81%

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-49.05	-2.53	-1.80	-49.9	-49.5	-13.6	0.15	0.90	1.24	1.30	1.36	3.59	3.57	3.52	3.49	3.45	3.41	3.36	3.31	3.25	3.21	3.14	3.09	3.02	2.95	2.88	2.82	2.74	2.66	2.58	2.51	2.42	2.32	2.28	2.28	2.28	2.28	2.28	2.28	2.28
	2	Capital cost 20% up	-59.20	-2.76	-1.97	-54.5	-54.1	-14.8	0.11	0.88	1.24	1.30	1.36	3.59	3.57	3.52	3.49	3.45	3.41	3.36	3.31	3.25	3.21	3.14	3.09	3.02	2.95	2.88	2.82	2.74	2.66	2.58	2.51	2.42	2.32	2.28	2.28	2.28	2.28	2.28	2.28	2.28
2	1	OM cost 10% up	-40.16	-2.30	-1.64	-45.4	-45.0	-12.3	0.13	0.88	1.19	1.25	1.31	3.54	3.52	3.47	3.44	3.40	3.36	3.31	3.26	3.20	3.16	3.09	3.04	2.97	2.90	2.83	2.77	2.69	2.61	2.53	2.46	2.37	2.27	2.23	2.23	2.23	2.23	2.23	2.23	2.23
	2	OM cost 20% up	-41.42	-2.30	-1.64	-45.5	-45.1	-12.4	0.08	0.83	1.14	1.20	1.26	3.49	3.47	3.42	3.39	3.35	3.31	3.26	3.21	3.15	3.11	3.04	2.99	2.92	2.85	2.78	2.72	2.64	2.56	2.48	2.41	2.32	2.22	2.18	2.18	2.18	2.18	2.18	2.18	2.18
3	1	Revenue 10% down	-46.42	-2.30	-1.64	-45.4	-45.1	-12.4	0.08	0.76	1.07	1.12	1.18	3.18	3.17	3.12	3.09	3.06	3.02	2.98	2.93	2.88	2.84	2.78	2.73	2.67	2.61	2.54	2.49	2.42	2.35	2.27	2.21	2.13	2.04	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	2	Revenue 20% down	-53.95	-2.30	-1.64	-45.5	-45.2	-12.5	-0.02	0.60	0.90	0.94	0.99	2.78	2.76	2.72	2.70	2.66	2.63	2.59	2.55	2.50	2.47	2.42	2.38	2.32	2.26	2.21	2.16	2.10	2.03	1.97	1.91	1.84	1.76	1.73	1.73	1.73	1.73	1.73	1.73	1.73

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-1.28%	-3.64	-27.46%
	2	Capital cost 20% up	-1.70%	-5.20	-19.23%
2	1	OM cost 10% up	-0.91%	-1.06	-93.93%
	2	OM cost 20% up	-1.01%	-1.93	-51.70%
3	1	Revenue 10% down	-1.43%	-4.32	-23.15%
	2	Revenue 20% down	-2.12%	-6.16	-16.24%

No.51 Vosketas

Information on Existing Water Sources (Aragatsotn)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.51 Community Vosketas
District Talin
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Spring	40	26	46.2	44	0	33.2	2,393	15.0	25.0	20.0
2											
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Acceptable
Notes	From this spring also No.38 Karmrashen community takes water. From this spring 4,6l/sec is given to Vosketas community.
Alternative sources if any	No alternative water sources are available

No.51 Community Vosketas
District Talin
Marz Aragatsotn
Sampling date 10/Sep/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		7.4				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	12.5					
c	TDS	Mg/L	22				1000	1000
1	Al:Aluminum	Mg/L	0.02				0.10	0.50
2	B:Boron	Mg/L	n.d				0.70	0.50
3	Cl:Chloride	Mg/L	5				250	350
4	Cr:Chrome	Mg/L	<0.01				0.05	0.05
5	Cu:Copper	Mg/L	n.d				2	1
6	F:Fluoride	Mg/L	0.02				1.50	
7	Hardness	Mg/L	50				500	700
8	Fe:Iron	Mg/L	n.d				0.30	0.30
9	Mn:Manganese	Mg/L	n.d				0.40	0.10
10	Mo:Molibdenum	Mg/L	<0.02				0.070	0.250
11	Ni:Nickel	Mg/L	n.d				0.020	0.100
12	Nitrate(NO3+)	Mg/L	1.3				50.0	45.0
13	SO4:Sulfate	Mg/L	2.0				250.0	500.0
14	Zn:Zink	Mg/L	n.d				3.0	5.0
15	As:Arsenic	Mg/L	n.d				0.0	0.1
16	Ba:Barium	Mg/L	<0,01				0.70	0.10
17	Be:Berillium	Mg/L	0.00005				NA	0.00020
18	Cd:Cadmium	Mg/L	<0,0001				0.0030	0.0010
19	Pb:Lead	Mg/L	<0,001				0.010	0.030
20	Hg:Mercury	Mg/L	<0,0002				0.00100	0.00050
21	Se:Selenium	Mg/L	<0,001				0.010	0.010
22	Sr:Strontium	Mg/L	<0,7				NA	7.0
23	CN:Cyanide	Mg/L	n.d				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml					-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml					0	0
26	Total bacteria	bacteria per 1 ml					-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.51 Community Vosketas
District Talin
Marz Aragatsotn

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not Identified	Not Identified
1	2		24	1.4	Not Identified
2	3		23	1.4	Not Identified
3	4		30	2.1	Not Identified
4	5		18	1.4	Not Identified
5	6		19	1.4	Not Identified
6	7		28	1.4	Not Identified
7	8		26	6.4	Not Identified

No. **51** **Marz** Aragatsotn **Community** Vosketas

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Difficult	Difficult	
2	Transmission pipeline	Difficult	Difficult	Pipeline is mostly far from the road
3	Reservoir	Fair	Possible	

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°26'46,2″	44°00'33,2″	2,393	1989	reinforced concrete	20.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	4,000	125	Steel	3.7	1991	Medium	Yes
2	4,000	100	Steel			Medium	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°26'56,5″	43°56'50,6″	2,079	reinforced concrete	Rectangular	12×6×4	250	No
2	40°26'56,5″	43°56'50,6″		reinforced concrete	Rectangular	12×6×4	250	No

5. CHLORINATION

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	Yes	Reservoir	Tablet	4time per week

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	1,050	50	Steel	1989	Huge	Yes
2	3,500	100	Steel		Huge	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
No							

8. PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
6	1992	2002	Yes	100	No

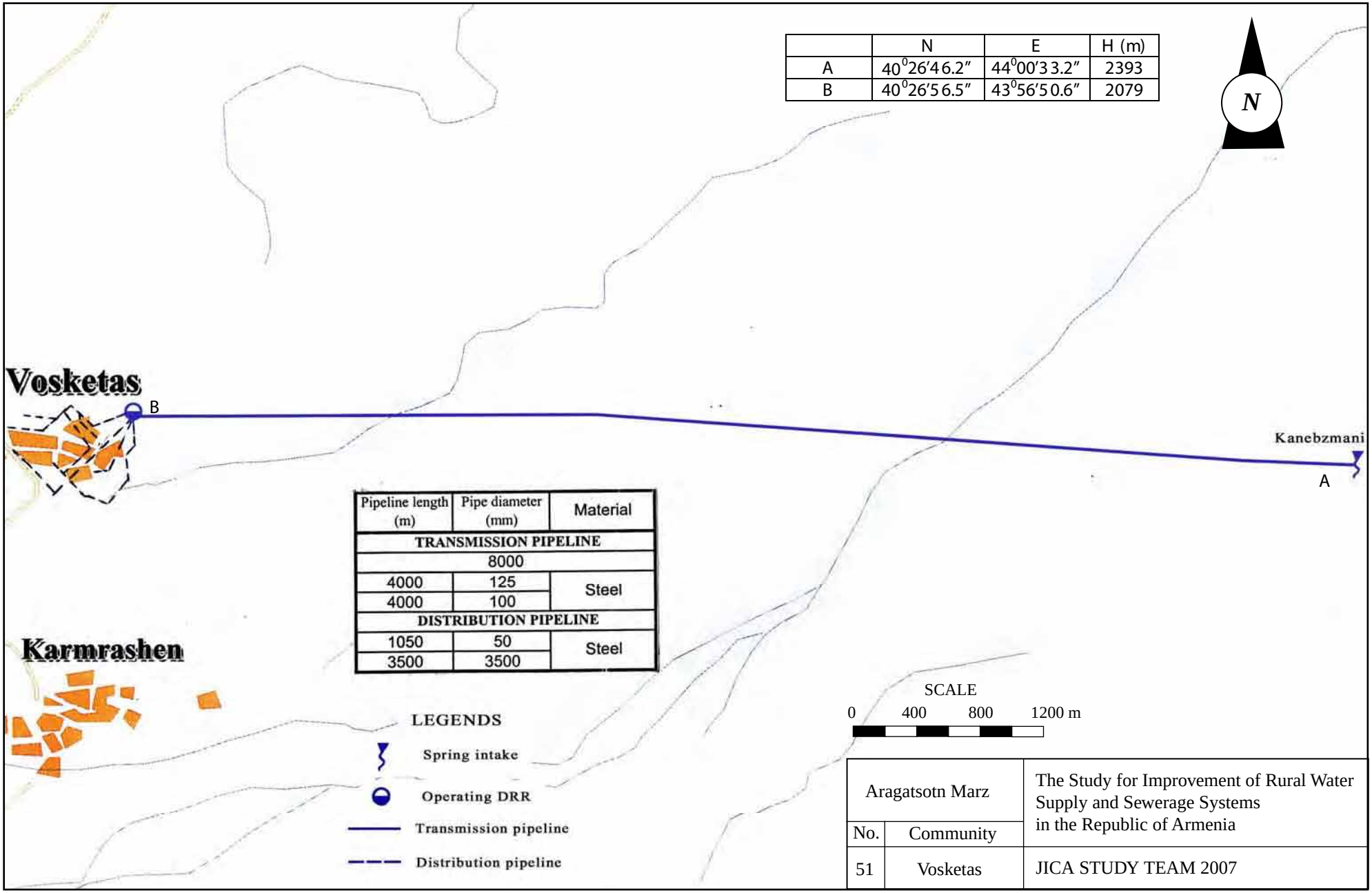
9. DRAINAGE SYSTEM

Existence (Y/N)	Rehabilitation Necessity (Y/N)	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No. 51Vosketas**
District	**Talin**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	600
A2	Actual population in 2007	620
A3	Number of households	128
A4.1	Elderly people	90
A4.2	Population in labor force (age from 16 to 62)	350
A4.3	Children	180
A5.1	Pensioners	100
A5.2	Unemployed	0
A5.3	Receiving benefits	22
A6	Average monthly income of household (AMD)	20,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	90
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	892
	Annual Budget of the community 2005, in thousand AMD	461
	Annual Budget of the community 2006, in thousand AMD	963
	Annual Budget of the community 2007, in thousand AMD	1,000
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	0
	Amount spent in drinking water sector 2005, in thousand AMD	0
	Amount spent in drinking water sector 2006, in thousand AMD	0
	Amount spent in drinking water sector 2007, in thousand AMD	0
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned.
C: Socio-Economic Survey		
C1	Major industries of the community:	dairy, meat
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1-Yes, 2-No	no
D2	Water use permit number	-
D3	Date of expiry of water use permit	-
D4	Planned date of obtaining water use permit	do not know
D5	Present condition of the water supply volume of Domestic use	almost sufficient
D6	Present condition of the water supply volume of Irrigation water	absent
D7	Number of house connection to drinking water system	90
D8	How many house connection household set the water meter	0
D9	Number of public taps	3
D10.1	How is the regime of water supply in your community in the dry season?	regularly. 4 hrs
D10.2	How is the regime of water supply in your community in the wet season?	regularly.15 hrs
D11	What time of day water is given?	8-12;8-23
D12	Are you pleased with duration of domestic water supply?	mainly displeased
D13	Are hours of water supply convenient?	mainly convenient
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	500
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	difficult to answer
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1Flate rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	from river, by spring (only 2% of village is irrigated)
D20	Are you satisfied with irrigation water supply volume?	is not sufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Karapetyan Gevorg
E2	Position	water distributor
E3	Telephone	with the help of administration head
E4	Quantity and present condition of the water supply facilities: spring/ intake	1 deteriorated
E5	Quantity and present condition of the water supply facilities:	1 deteriorated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	2-is not used
E7	Quantity and present condition of the water supply facilities: net/distribution pipes	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	rehabilitated
E9	Quantity and present condition of the water supply facilities: pump	absent
E10	Who is the owner of the water supply facilities?	community
E11	Who is engaged in the water supply facilities repairing works?	community and residents
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	administration head
E14	How you prepare O&M costs?	payment from employed population
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	72,000
	Repair cost(AMD)	300,000
	Others(AMD)	0
	Total (AMD)	372,000
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	water fee
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent



	N	E	H (m)
A	40°26′46.2″	44°00′33.2″	2393
B	40°26′56.5″	43°56′50.6″	2079

Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
8000		
4000	125	Steel
4000	100	
DISTRIBUTION PIPELINE		
1050	50	Steel
3500	3500	

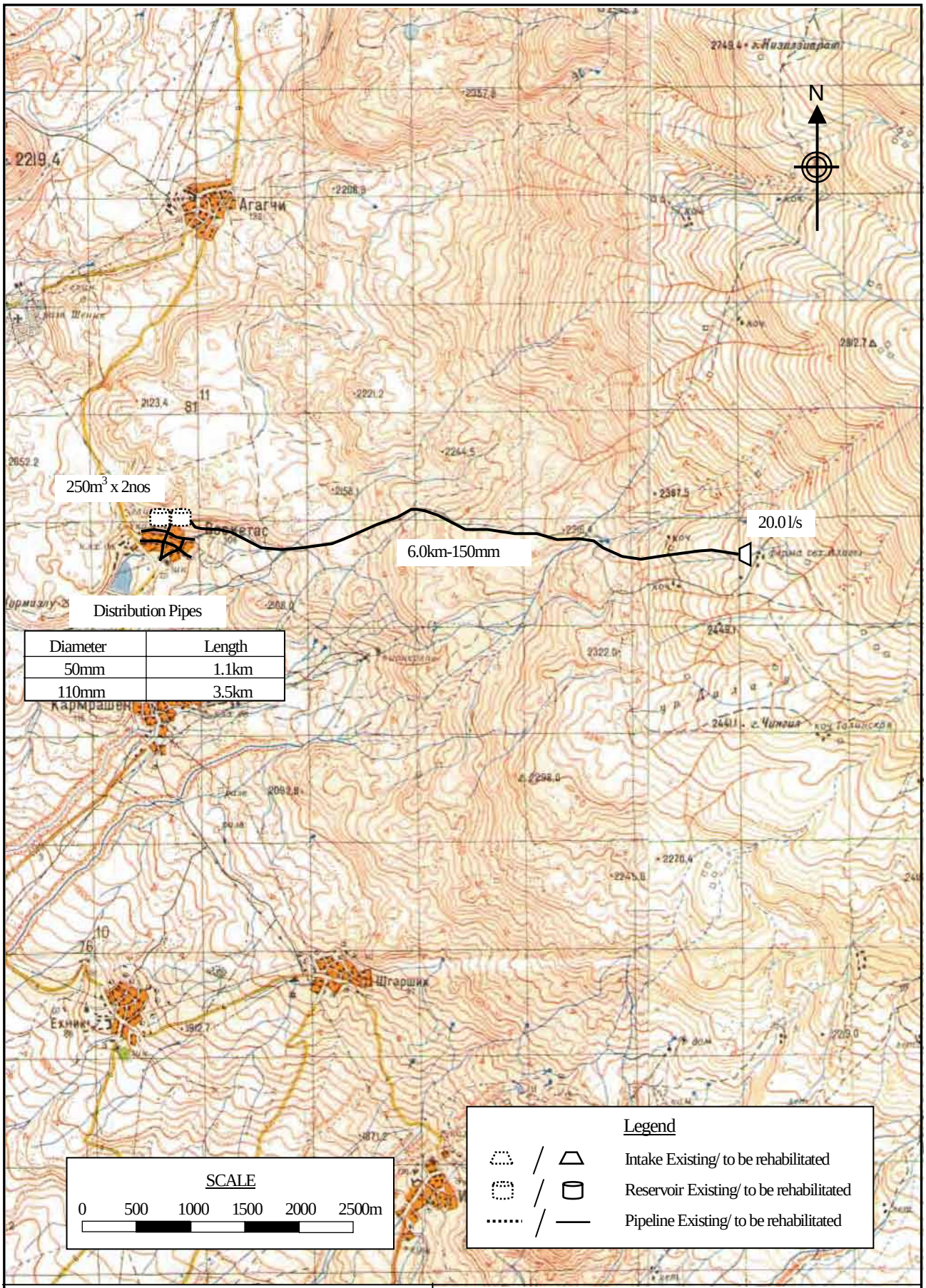
Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
51	Vosketas	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.51
Name : **Vosketas**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	620	persons	62.0	
	2 Factory	-	nos	0.0	
	3 School (pupils)	90	pupils	0.9	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	128	household	11.1	
	Sub-total			74.0	
	Unaccouted for water (20%)			14.8	
1	Average Daily Water Demand			88.8	m3/day
2	Maximum Daily Water Demand			106.6	m3/day
3	Maximum Hourly Water Demand			14.4	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	1	20.0	lit/sec		1,728.0	m3/day
`	Total					1,728.0	m3/day
	2 Required reservoir volume					173	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**		
	No Item	Quantity	Unit
	1 Intake		
	1m3		nos
	2m3	1	nos
	3m3		nos
	4m3		nos
	2 Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter		m
	150mm diameter	6,000	m
	200mm diameter		m
	250mm diameter		m
	3 Reservoir		
	4 Distribution pipe		
	50mm diameter	1,100	m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	3,500	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
	5 House connection	38	nos
	6 Water meter installation	128	nos
	7 Public tap	2	nos
	8 Chlorination	1	nos
	9 Pumps	-	nos



Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Aragatsotn	
No. 51	Vosketas	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **51**
Name : **Vosketas**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3		nos	367,700	
		2m3	1	nos	545,000	545,000
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					545,000
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm	6,000	m	13,140	78,840,000
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					78,840,000
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3		nos	18,804,500	
		200m3		nos	22,524,600	
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					
4	Distribution Pipe					
		50mm	1,100	m	5,520	6,072,000
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	3,500	m	9,680	33,880,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					39,952,000
5	House Connection		38	nos	74,000	2,812,000
6	Water Meter Installation		128	nos	80,000	10,240,000
7	Public Tap		2	nos	90,000	180,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	1,840	m	3,600	6,624,000
	Total				AMD	139,693,000
					Equivalent to USD	457,230
					Equivalent to JPY	48,237,796
					AMD	USD
	Investment Cost per household		128	HH	1,091,352	3,572
	Investment Cost per person		620	persons	225,311	737

ARAGATSOTN MARZ
Talin District
No 51 Vosketas

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		27.0																																							
Unit rate	AMD/m3				40.00	40.00	40.00	41.32	70.00	72.31	74.70	77.16	115.65	119.47	123.41	127.48	131.69	136.03	140.52	145.16	149.95	154.90	160.01	165.29	170.75	176.38	182.20	188.21	194.42	200.84	207.47	214.31	221.39	228.69	236.24	244.04	252.09	260.41	269.00	277.88	287.05	296.52
Sub-total		150.88	0.00	0.00	0.43	0.86	0.97	1.00	1.70	1.76	1.82	1.88	2.81	2.90	3.00	3.10	3.20	3.31	3.42	3.53	3.65	3.77	3.89	4.02	4.15	4.29	4.43	4.58	4.73	4.88	5.04	5.21	5.38	5.56	5.74	5.93	6.13	6.33	6.54	6.75	6.98	7.21
B Operating Costs																																									
1. Staff salary																																									
Inspectors	person				1																																				
Pump operators	person				0																																				
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		17.70			0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.51	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80
2. Chlorine																																									
Pouring volume	kg/yr				163																																				
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		7.16			0.04	0.09	0.10	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.30	0.31	0.33
3. Electricity (for pump)		0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Maintenance cost		32.15			0.19	0.40	0.47	0.49	0.50	0.52	0.53	0.55	0.57	0.59	0.61	0.63	0.65	0.67	0.69	0.72	0.74	0.76	0.79	0.82	0.84	0.87	0.90	0.93	0.96	0.99	1.02	1.06	1.09	1.13	1.17	1.20	1.24	1.28	1.33	1.37	1.42	1.46
Pump repair					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe repair					0.19	0.4	0.47	0.49	0.50	0.52	0.53	0.55	0.57	0.59	0.61	0.63	0.65	0.67	0.69	0.72	0.74	0.76	0.79	0.82	0.84	0.87	0.90	0.93	0.96	0.99	1.02	1.06	1.09	1.13	1.17	1.20	1.24	1.28	1.33	1.37	1.42	1.46
5. Pump replacement		0.00																0.00															0.00									
Sub-total		57.01	0.00	0.00	0.47	0.74	0.83	0.86	0.88	0.92	0.94	0.97	1.01	1.04	1.08	1.11	1.14	1.19	1.22	1.27	1.30	1.35	1.40	1.44	1.49	1.53	1.59	1.65	1.69	1.75	1.81	1.88	1.93	2.00	2.07	2.13	2.20	2.27	2.35	2.42	2.50	2.59
C Gross Income (A-B)		93.87	0.00	0.00	-0.04	0.12	0.14	0.14	0.82	0.84	0.88	0.91	1.80	1.86	1.92	1.99	2.06	2.12	2.20	2.26	2.35	2.42	2.49	2.58	2.66	2.76	2.84	2.93	3.04	3.13	3.23	3.33	3.45	3.56	3.67	3.80	3.93	4.06	4.19	4.33	4.48	4.62
D Depreciation cost		132.65						3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79
E Interest paid		41.31	0.02	0.04	0.77	1.53	1.74	1.75	1.75	1.75	1.75	1.75	1.75	1.70	1.65	1.60	1.55	1.50	1.44	1.39	1.34	1.28	1.23	1.17	1.11	1.06	1.00	0.94	0.88	0.82	0.76	0.70	0.64	0.58	0.52	0.46	0.39	0.33	0.27	0.20	0.13	0.07
F Net Income		-80.09	-0.02	-0.04	-0.81	-1.41	-1.60	-5.40	-4.72	-4.70	-4.66	-4.63	-3.74	-3.63	-3.52	-3.40	-3.28	-3.17	-3.03	-2.92	-2.78	-2.65	-2.53	-2.38	-2.24	-2.09	-1.95	-1.80	-1.63	-1.48	-1.32	-1.16	-0.98	-0.81	-0.64	-0.45	-0.25	-0.06	0.13	0.34	0.56	0.76
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		-80.09	-0.02	-0.04	-0.81	-1.41	-1.60	-5.40	-4.72	-4.70	-4.66	-4.63	-3.74	-3.63	-3.52	-3.40	-3.28	-3.17	-3.03	-2.92	-2.78	-2.65	-2.53	-2.38	-2.24	-2.09	-1.95	-1.80	-1.63	-1.48	-1.32	-1.16	-0.98	-0.81	-0.64	-0.45	-0.25	-0.06	0.13	0.34	0.56	0.76
OM Cost Recovery Ratio (A/B)		265%	0%	0%	91%	117%	117%	116%	193%	191%	194%	194%	278%	279%	278%	279%	281%	278%	280%	278%	281%	279%	278%	279%	279%	280%	279%	278%	280%	279%	278%	277%	279%	278%	277%	278%	279%	279%	278%	279%	279%	278%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	-80.09	-0.02	-0.04	-0.81	-1.41	-1.60	-5.40	-4.72	-4.70	-4.66	-4.63	-3.74	-3.63	-3.52	-3.40	-3.28	-3.17	-3.03	-2.92	-2.78	-2.65	-2.53	-2.38	-2.24	-2.09	-1.95	-1.80	-1.63	-1.48	-1.32	-1.16	-0.98	-0.81	-0.64	-0.45	-0.25	-0.06	0.13	0.34	0.56	0.76
2. Depreciation cost	132.65	0.00	0.00	0.00	0.00	0.00	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79
3. Interest Paid	41.31	0.02	0.04	0.77	1.53	1.74	1.75	1.75	1.75	1.75	1.75	1.75	1.70	1.65	1.60	1.55	1.50	1.44	1.39	1.34	1.28	1.23	1.17	1.11	1.06	1.00	0.94	0.88	0.82	0.76	0.70	0.64	0.58	0.52	0.46	0.39	0.33	0.27	0.20	0.13	0.07
Sub-total	93.87	0.00	0.00	-0.04	0.12	0.14	0.14	0.82	0.84	0.88	0.91	1.80	1.86	1.92	1.99	2.06	2.12	2.20	2.26	2.35	2.42	2.49	2.58	2.66	2.76	2.84	2.93	3.04	3.13	3.23	3.33	3.45	3.56	3.67	3.80	3.93	4.06	4.19	4.33	4.48	4.62
B Finances																																									
1. Project Loan	175.28	2.36	1.67	73.35	75.59	21.67	0.36	0.28																																	
2. Local fund	59.88	0.79	0.56	24.84	25.95	7.53	0.12	0.09																																	
Sub-total	235.16	3.15	2.23	98.19	101.54	29.20	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	122.71	0.02	0.04	0.77	1.41	1.60	1.61	0.93	0.91	0.87	0.84	4.99	4.93	4.87	4.80	4.73	4.68	4.59	4.53	4.45	4.37	4.31	4.21	4.13	4.04	3.95	3.86	3.75	3.66	3.56	3.46	3.34	3.23	3.12	3.00	2.86	2.73	2.61	2.46	2.31	2.18
Sub-total	122.75	0.02	0.04	0.81	1.41	1.60	1.61	0.93	0.91	0.87	0.84	4.99	4.93	4.87	4.80	4.73	4.68	4.59	4.53	4.45	4.37	4.31	4.21	4.13	4.04	3.95	3.86	3.75	3.66	3.56	3.46	3.34	3.23	3.12	3.00	2.86	2.73	2.61	2.46	2.31	2.18
Total Cash Inflow	451.78	3.17	2.27	98.96	103.07	30.94	2.23	2.12	1.75	1.75	1.75	6.79	6.79	6.79	6.79	6.79	6.80	6.79	6.79	6.80	6.79	6.80	6.79	6.79	6.80	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.80	6.79	6.79	6.80	6.79	6.79	6.80
APPLICATION OF FUNDS																																								
D Project disbursement	235.16	3.15	2.23	98.19	101.54	29.20	0.48	0.37																																	
E Total debt services																																								
1. Loan repayment	175.31											5.04	5.09	5.14	5.19	5.24	5.30	5.35	5.40	5.46	5.51	5.57	5.62	5.68	5.74	5.79	5.85	5.91	5.97	6.03	6.09	6.15	6.21	6.27	6.34	6.40	6.46	6.53	6.59	6.66	6.73
2. Interest paid	41.31	0.02	0.04	0.77	1.53	1.74	1.75	1.75	1.75	1.75	1.75	1.75	1.70	1.65	1.60	1.55	1.50	1.44	1.39	1.34	1.28	1.23	1.17	1.11	1.06	1.00	0.94	0.88	0.82	0.76	0.70	0.64	0.58	0.52	0.46	0.39	0.33	0.27	0.20	0.13	0.07
Sub-total	216.62	0.02	0.04	0.77	1.53	1.74	1.75	1.75	1.75	1.75	1.75	6.79	6.79	6.79	6.79	6.79	6.80	6.79	6.79	6.80	6.79	6.80	6.79	6.79	6.80	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.80	6.79	6.79	6.80	6.79	6.79	6.80
Total Cash Outflow	451.78	3.17	2.27	98.96	103.07	30.94	2.23	2.12	1.75	1.75	1.75	6.79	6.79	6.79	6.79	6.79	6.80	6.79	6.79	6.80	6.79	6.80	6.79	6.79	6.80	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.80	6.79	6.79	6.80	6.79	6.79	6.80
F Net Surplus Cash (A+C2)-E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	43%	0%	0%	0%	8%	8%	8%	47%	48%	50%	52%	27%	27%	28%	29%	30%	31%	32%	33%	35%	36%	37%	38%	39%	41%	42%	43%	45%	46%	48%	49%	51%	52%	54%	56%	58%	60%	62%	64%	66%	68%
Cost recovery by water fee + subsidy ((A+C2)/E)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ARAGATSOTN MARZ
Talin District
No 51 Vosketas

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	150.88	55.1%
	Subsidy	122.75	44.9%
	Total	273.63	100.0%
2	**Expenditure**		
	OM cost	57.01	20.8%
	Loan repayment	175.31	64.1%
	Interest paid	41.31	15.1%
	Surplus cash	0.00	0.0%
	Total	273.63	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																								
1. Investment Cost	157.01	2.30	1.64	66.96	66.89	18.63	0.33	0.26																																
2. Operation and Maintenance Cost																																								
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	3.73			0.04	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Electricity	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mantenance cost	16.42			0.19	0.39	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Pump replacement																	0.00															0.00									
Sub-total	29.27			0.47	0.72	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Total Outflow	186.28	2.30	1.64	67.43	67.61	19.41	1.11	1.04	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
B BENEFIT																																								
1. Water Tariff	94.72	0.00	0.00	0.43	0.86	0.97	1.00	1.70	1.76	1.82	1.88	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81
2. Subsidy	85.29	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.24	3.23	3.22	3.20	3.18	3.18	3.15	3.14	3.11	3.09	3.08	3.04	3.02	2.98	2.95	2.92	2.87	2.84	2.80	2.76	2.70	2.65	2.60	2.54	2.47	2.40	2.34	2.26	2.18	2.11
Total Inflow	180.01	0.00	0.00	0.47	0.86	0.97	1.00	1.70	1.76	1.82	1.88	6.05	6.04	6.03	6.01	5.99	5.99	5.96	5.95	5.92	5.90	5.89	5.85	5.83	5.79	5.76	5.73	5.68	5.65	5.61	5.57	5.51	5.46	5.41	5.35	5.28	5.21	5.15	5.07	4.99	4.92
NET BENEFIT	-6.27	-2.30	-1.64	-67.0	-66.7	-18.4	-0.11	0.66	0.98	1.04	1.10	5.27	5.26	5.25	5.23	5.21	5.21	5.18	5.17	5.14	5.12	5.11	5.07	5.05	5.01	4.98	4.95	4.90	4.87	4.83	4.79	4.73	4.68	4.63	4.57	4.50	4.43	4.37	4.29	4.21	4.14

FIRR = -0.20%

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-62.28	-2.53	-1.80	-73.7	-73.4	-20.3	-0.14	0.63	0.98	1.04	1.10	5.27	5.26	5.25	5.23	5.21	5.21	5.18	5.17	5.14	5.12	5.11	5.07	5.05	5.01	4.98	4.95	4.90	4.87	4.83	4.79	4.73	4.68	4.63	4.57	4.50	4.43	4.37	4.29	4.21	4.14
	2	Capital cost 20% up	-77.02	-2.76	-1.97	-80.4	-80.1	-22.2	-0.18	0.61	0.98	1.04	1.10	5.27	5.26	5.25	5.23	5.21	5.21	5.18	5.17	5.14	5.12	5.11	5.07	5.05	5.01	4.98	4.95	4.90	4.87	4.83	4.79	4.73	4.68	4.63	4.57	4.50	4.43	4.37	4.29	4.21	4.14
2	1	OM cost 10% up	-49.58	-2.30	-1.64	-67.0	-66.8	-18.5	-0.19	0.58	0.90	0.96	1.02	5.19	5.18	5.17	5.15	5.13	5.13	5.10	5.09	5.06	5.04	5.03	4.99	4.97	4.93	4.90	4.87	4.82	4.79	4.75	4.71	4.65	4.60	4.55	4.49	4.42	4.35	4.29	4.21	4.13	4.06
	2	OM cost 20% up	-51.63	-2.30	-1.64	-67.1	-66.9	-18.6	-0.27	0.50	0.82	0.88	0.94	5.11	5.10	5.09	5.07	5.05	5.05	5.02	5.01	4.98	4.96	4.95	4.91	4.89	4.85	4.82	4.79	4.74	4.71	4.67	4.63	4.57	4.52	4.47	4.41	4.34	4.27	4.21	4.13	4.05	3.98
3	1	Revenue 10% down	-59.57	-2.30	-1.64	-67.0	-66.8	-18.5	-0.21	0.49	0.80	0.86	0.91	4.67	4.66	4.65	4.63	4.61	4.61	4.58	4.58	4.55	4.53	4.52	4.49	4.47	4.43	4.40	4.38	4.33	4.31	4.27	4.23	4.18	4.13	4.09	4.04	3.97	3.91	3.86	3.78	3.71	3.65
	2	Revenue 20% down	-71.60	-2.30	-1.64	-67.1	-66.9	-18.6	-0.31	0.32	0.63	0.68	0.72	4.06	4.05	4.04	4.03	4.01	4.01	3.99	3.98	3.96	3.94	3.93	3.90	3.88	3.85	3.83	3.80	3.76	3.74	3.71	3.68	3.63	3.59	3.55	3.50	3.44	3.39	3.34	3.28	3.21	3.16

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.64%	-6.97	-14.34%
	2	Capital cost 20% up	-1.05%	-8.14	-12.29%
2	1	OM cost 10% up	-0.29%	-3.22	-31.08%
	2	OM cost 20% up	-0.38%	-4.88	-20.48%
3	1	Revenue 10% down	-0.79%	-7.53	-13.28%
	2	Revenue 20% down	-1.45%	-8.65	-11.56%

No.52 Chqnagh

Information on Existing Water Sources (Aragatsotn)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.52 Community Chqnagh
District Aparan
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Martoyi Chamer spring	40	35	13.9	44	25	4.7	2,076	0.8	1.0	0.7
2	Bokhan spring	40	35	47.9	44	25	21.0	2,211	0.8	1.0	1.0
3	Sardoyi spring	40	35	35.5	44	25	29.7	2,105	0.3	0.6	0.5
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Acceptable
Notes	The spring intakes are deteriorated.
Alternative sources if any	No alternative water sources are available

No.52 Community Chqnagh
District Aparan
Marz Aragatsotn
Sampling date 15/Aug/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		7.8				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	17.8					
c	TDS	Mg/L	99				1000	1000
1	Al:Aluminum	Mg/L	n.d				0.10	0.50
2	B:Boron	Mg/L	n.d				0.70	0.50
3	Cl:Chloride	Mg/L	5				250	350
4	Cr:Chrome	Mg/L	0.01				0.05	0.05
5	Cu:Copper	Mg/L	n.d				2	1
6	F:Fluoride	Mg/L	0.02				1.50	
7	Hardness	Mg/L	200				500	700
8	Fe:Iron	Mg/L	n.d				0.30	0.30
9	Mn:Manganese	Mg/L	n.d				0.40	0.10
10	Mo:Molibdenum	Mg/L	n.d				0.070	0.250
11	Ni:Nickel	Mg/L	n.d				0.020	0.100
12	Nitrate(NO3+)	Mg/L	2.7				50.0	45.0
13	SO4:Sulfate	Mg/L	3.5				250.0	500.0
14	Zn:Zink	Mg/L	n.d				3.0	5.0
15	As:Arsenic	Mg/L	n.d				0.0	0.1
16	Ba:Barium	Mg/L	<0.01				0.70	0.10
17	Be:Berillium	Mg/L	<0.00005				NA	0.00020
18	Cd:Cadmium	Mg/L	n.d				0.0030	0.0010
19	Pb:Lead	Mg/L	<0.001				0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002				0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001				0.010	0.010
22	Sr:Strontium	Mg/L	n.d				NA	7.0
23	CN:Cyanide	Mg/L	n.d				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml					-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml					0	0
26	Total bacteria	bacteria per 1 ml					-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.52 Community Chqnagh
District Aparan
Marz Aragatsotn

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not Identified	Not Identified
1	2			0.0	Not Identified
2	3			0.9	Not Identified
3	5			0.9/6; 1.5/1	Not Identified
4	6			0.9/1; 1.1/1; 2.9/2	Not Identified

No. 52 **Marz** Aragatsotn **Community** Chqnagh

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Difficult	Unknown	
2	Transmission pipeline	Difficult	Unknown	Pipeline is mostly far from the road
3	Reservoir	Fair	Possible	

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°35'13.9″	44°25'04.7″	2,076	1997	Concrete	0.7	Yes
2	Spring	40°35'47.9″	44°25'21.0″	2,211	1997	Concrete	1.0	Yes
3	Spring	40°35'35.5″	44°25'29.7″	2,105	1997	Concrete	0.5	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	1,000	50	Steel	0.76	1997	Little	Yes
2	600	50	Steel	1.4	1997	Little	Yes
	2,000	80	Steel		1997	Little	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°34'52.0″	44°26'03.8″	1,984	reinforced concrete	Rectangular	12x6x4	250	Yes

5. CHLORINATION

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	Yes	Reservoir	Powder	Once a year

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	300	100	Steel	1970	Little	Yes
2	130	80	Steel	1970	Medium	Yes
3	450	50	Steel	1970	Medium	Yes
4	960	25	Steel	1970	Medium	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
No							

8. PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
No					

9. DRAINAGE SYSTEM

Existence (Y/N)	Rehabilitation Necessity (Y/N)	Remarks
No	Yes	

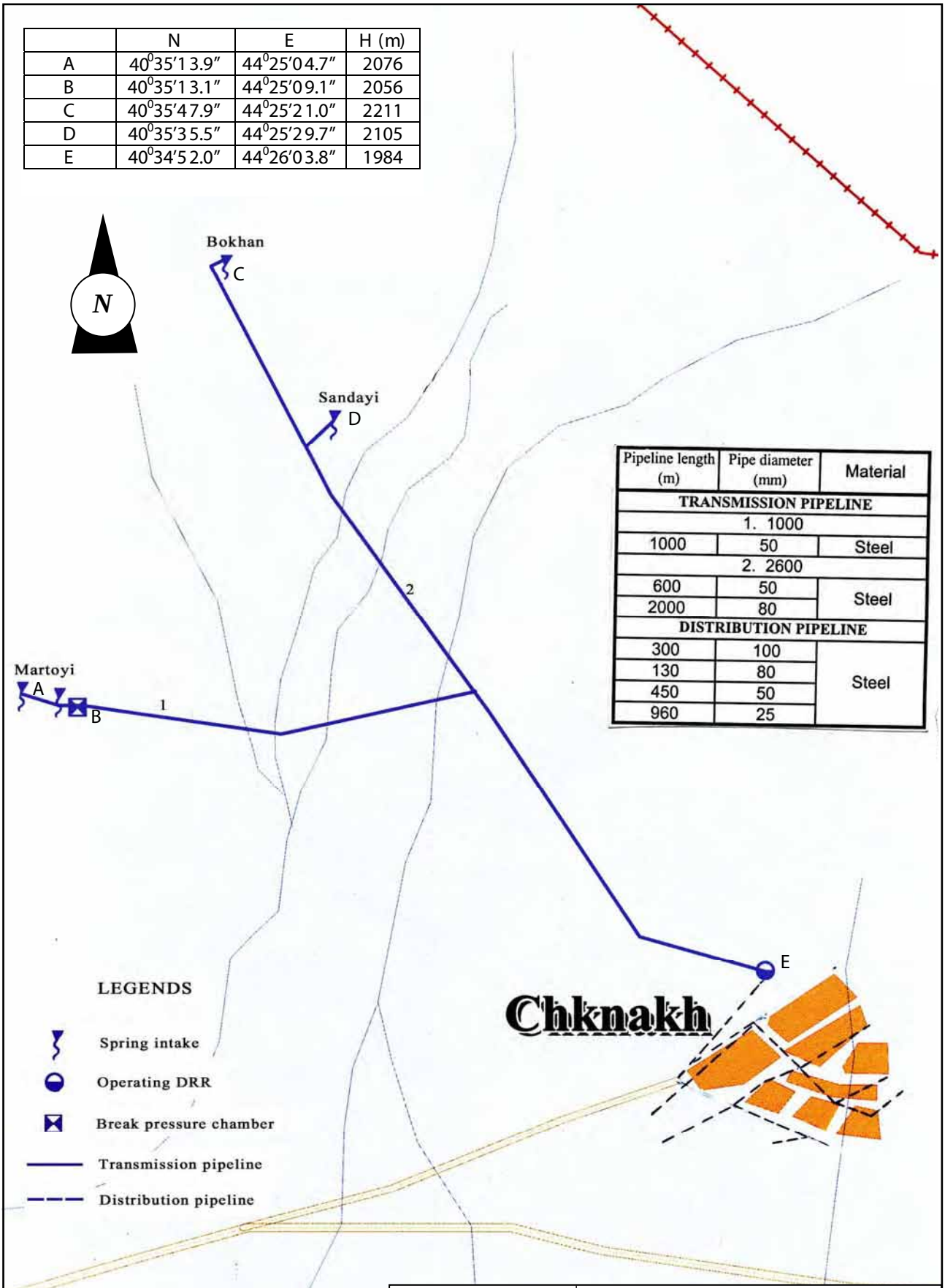
Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.52 Chqnagh**
District	**Aparan**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	275
A2	Actual population in 2007	286
A3	Number of households	65
A4.1	Elderly people	27
A4.2	Population in labor force (age from 16 to 62)	168
A4.3	Children	91
A5.1	Pensioners	54
A5.2	Unemployed	0
A5.3	Receiving benefits	0
A6	Average monthly income of household (AMD)	40,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	39
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	3,309
	Annual Budget of the community 2005, in thousand AMD	3,588
	Annual Budget of the community 2006, in thousand AMD	3,870
	Annual Budget of the community 2007, in thousand AMD	2,500
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	100
	Amount spent in drinking water sector 2005, in thousand AMD	120
	Amount spent in drinking water sector 2006, in thousand AMD	110
	Amount spent in drinking water sector 2007, in thousand AMD	30
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned.
C: Socio-Economic Survey		
C1	Major industries of the community:	dairy, meat, cereals
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1-Yes, 2-No	yes
D2	Water use permit number	1364
D3	Date of expiry of water use permit	06.04.07-06.04.10
D4	Planned date of obtaining water use permit	-
D5	Present condition of the water supply volume of Domestic use	almost sufficient
D6	Present condition of the water supply volume of Irrigation water	absent
D7	Number of house connection to drinking water system	65
D8	How many house connection household set the water meter	0
D9	Number of public taps	1
D10.1	How is the regime of water supply in your community in the dry season?	8-10 hrs, regularly
D10.2	How is the regime of water supply in your community in the wet season?	24 hrs
D11	What time of day water is given?	7-11; 18-23
D12	Are you pleased with duration of domestic water supply?	mainly pleased
D13	Are hours of water supply convenient?	mainly convenient
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	500
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	difficult to answer
D16	Drinking water monthly water fee per household	50¹ñ/ per capita
D17	How often do you usually pay water fees?	each month
D18	Water fee structure 1Flate rate, 2 Having water tariff	flat rate
D19	Where do you acquire the irrigation water?	absent
D20	Are you satisfied with irrigation water supply volume?	is not sufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Davtyan Vanya
E2	Position	administrtion head
E3	Telephone	(093)102387
E4	Quantity and present condition of the water supply facilities: spring/ intake	3 deteriorated
E5	Quantity and present condition of the water supply facilities:	1 rehabilitated·
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	1 deteriorated
E7	Quantity and present condition of the water supply facilities: net/distribution pipes	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	deteriorated
E9	Quantity and present condition of the water supply facilities: pump	absent
E10	Who is the owner of the water supply facilities?	community
E11	Who is engaged in the water supply facilities repairing works?	community and residents
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	volunteers from community
E14	How you prepare O&M costs?	community budget
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	0
	Repair cost(AMD)	100,000
	Others(AMD)	0
	Total (AMD)	100,000
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	water fee
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent

Aragatsotn
No.52 Chqnagh

	N	E	H (m)
A	40°35′13.9″	44°25′04.7″	2076
B	40°35′13.1″	44°25′09.1″	2056
C	40°35′47.9″	44°25′21.0″	2211
D	40°35′35.5″	44°25′29.7″	2105
E	40°34′52.0″	44°26′03.8″	1984



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
1. 1000		
1000	50	Steel
2. 2600		
600	50	Steel
2000	80	
DISTRIBUTION PIPELINE		
300	100	Steel
130	80	
450	50	
960	25	

Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
52	Chqnagh	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.52
Name : **Chqnagh**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
1	Population	286	persons	28.6	
2	Factory	-	nos	0.0	
3	School (pupils)	39	pupils	0.4	
4	Medical Ambulance Station	-	nos	-	
5	Policlinic	-	nos	-	
6	Livestocks (87lit/household)	65	household	5.7	
	Sub-total			34.7	
	Unaccouted for water (20%)			6.9	
1	Average Daily Water Demand			41.6	m3/day
2	Maximum Daily Water Demand			50.0	m3/day
3	Maximum Hourly Water Demand			10.8	m3/hr

B WATER SUPPLY PLAN

		Nr.	Total vol.			
1	Water source type					
a	Spring	3	2.2	lit/sec	190.1	m3/day
`	Total				190.1	m3/day
2	Required reservoir volume				130	m3

C WATER SUPPLY FACILITIES REHABILITATION PLAN

No	Item	Quantity	Unit	
1	Intake			
	1m3	3	nos	
	2m3		nos	
	3m3		nos	
	4m3		nos	
2	Transmission pipe			Done by World vision
	50mm diameter		m	1600m rehabilitation
	75mm diameter		m	
	90mm diameter		m	2000m rehabilitation
	110mm diameter		m	
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
3	Reservoir			
	150m3 capacity	1	nos	
4	Distribution pipe			Done by world vision
	50mm diameter		m	1410m rehabilitation
	75mm diameter		m	
	90mm diameter		m	130m rehabilitation
	110mm diameter		m	300m rehabilitation
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
5	House connection	0	nos	
6	Water meter installation	65	nos	
7	Public tap	1	nos	
8	Chlorination	1	nos	
9	Pumps	0	nos	

Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Aragatsotn	
No. 52	Chqnagh	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **52**
Name : **Chqnagh**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	3	nos	367,700	1,103,100
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					1,103,100
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3	1	nos	18,804,500	18,804,500
		200m3		nos	22,524,600	
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					18,804,500
4	Distribution Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					
5	House Connection			nos	74,000	
6	Water Meter Installation		65	nos	80,000	5,200,000
7	Public Tap		1	nos	90,000	90,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa		m	3,600	
	Total				AMD	25,697,600
					Equivalent to USD	84,111
					Equivalent to JPY	8,873,713
					AMD	USD
	Investment Cost per household		65	HH	395,348	1,294
	Investment Cost per person		286	persons	89,852	294

ARAGATSOTN MARZ
Aparan District
No 52 Chqnagh

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		12.7																																							
Unit rate	AMD/m3				40.00	40.00	40.00	41.32	70.00	72.31	74.70	77.16	115.65	119.47	123.41	127.48	131.69	136.03	140.52	145.16	149.95	154.90	160.01	165.29	170.75	176.38	182.20	188.21	194.42	200.84	207.47	214.31	221.39	228.69	236.24	244.04	252.09	260.41	269.00	277.88	287.05	296.52
Sub-total		70.69	0.00	0.00	0.19	0.37	0.46	0.47	0.80	0.82	0.85	0.88	1.32	1.36	1.41	1.45	1.50	1.55	1.60	1.65	1.71	1.77	1.82	1.88	1.95	2.01	2.08	2.15	2.22	2.29	2.36	2.44	2.52	2.61	2.69	2.78	2.87	2.97	3.07	3.17	3.27	3.38
B Operating Costs																																										
1. Staff salary																																										
Inspectors	person				1																																					
Pump operators	person				0																																					
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		17.70			0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.51	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80
2. Chlorine																																										
Pouring volume	kg/yr				76																																					
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		3.33			0.02	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.15
3. Electricity (for pump)		0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Maintenance cost		13.85			0.08	0.16	0.20	0.21	0.22	0.22	0.23	0.24	0.25	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.38	0.39	0.40	0.41	0.43	0.44	0.46	0.47	0.49	0.50	0.52	0.54	0.55	0.57	0.59	0.61	0.63
Pump repair					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe repair					0.08	0.16	0.20	0.21	0.22	0.22	0.23	0.24	0.25	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.38	0.39	0.40	0.41	0.43	0.44	0.46	0.47	0.49	0.50	0.52	0.54	0.55	0.57	0.59	0.61	0.63
5. Pump replacement		0.00																0.00															0.00									
Sub-total		34.88	0.00	0.00	0.34	0.45	0.51	0.52	0.54	0.55	0.58	0.60	0.62	0.63	0.65	0.68	0.70	0.73	0.75	0.77	0.80	0.83	0.85	0.87	0.91	0.94	0.97	1.01	1.03	1.07	1.11	1.15	1.18	1.23	1.26	1.30	1.35	1.38	1.43	1.48	1.53	1.58
C Gross Income (A-B)		35.81	0.00	0.00	-0.15	-0.08	-0.05	-0.05	0.26	0.27	0.27	0.28	0.70	0.73	0.76	0.77	0.80	0.82	0.85	0.88	0.91	0.94	0.97	1.01	1.04	1.07	1.11	1.14	1.19	1.22	1.25	1.29	1.34	1.38	1.43	1.48	1.52	1.59	1.64	1.69	1.74	1.80
D Depreciation cost		24.50						0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
E Interest paid		9.59	0.02	0.04	0.18	0.33	0.39	0.41	0.41	0.41	0.41	0.41	0.40	0.39	0.38	0.37	0.36	0.35	0.33	0.32	0.31	0.30	0.28	0.27	0.26	0.24	0.23	0.22	0.20	0.19	0.18	0.16	0.15	0.13	0.12	0.11	0.09	0.08	0.06	0.05	0.03	0.02
F Net Income		1.72	-0.02	-0.04	-0.33	-0.41	-0.44	-1.16	-0.85	-0.84	-0.84	-0.83	-0.40	-0.36	-0.32	-0.30	-0.26	-0.23	-0.18	-0.14	-0.10	-0.06	-0.01	0.04	0.08	0.13	0.18	0.22	0.29	0.33	0.37	0.43	0.49	0.55	0.61	0.67	0.73	0.81	0.88	0.94	1.01	1.08
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		1.72	-0.02	-0.04	-0.33	-0.41	-0.44	-1.16	-0.85	-0.84	-0.84	-0.83	-0.40	-0.36	-0.32	-0.30	-0.26	-0.23	-0.18	-0.14	-0.10	-0.06	-0.01	0.04	0.08	0.13	0.18	0.22	0.29	0.33	0.37	0.43	0.49	0.55	0.61	0.67	0.73	0.81	0.88	0.94	1.01	1.08
OM Cost Recovery Ratio (A/B)		203%	0%	0%	56%	82%	90%	90%	148%	149%	147%	147%	213%	216%	217%	213%	214%	212%	213%	214%	214%	213%	214%	216%	214%	214%	214%	213%	216%	214%	213%	212%	214%	212%	213%	214%	213%	215%	215%	214%	214%	214%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	1.72	-0.02	-0.04	-0.33	-0.41	-0.44	-1.16	-0.85	-0.84	-0.84	-0.83	-0.40	-0.36	-0.32	-0.30	-0.26	-0.23	-0.18	-0.14	-0.10	-0.06	-0.01	0.04	0.08	0.13	0.18	0.22	0.29	0.33	0.37	0.43	0.49	0.55	0.61	0.67	0.73	0.81	0.88	0.94	1.01	1.08
2. Depreciation cost	24.50	0.00	0.00	0.00	0.00	0.00	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
3. Interest Paid	9.59	0.02	0.04	0.18	0.33	0.39	0.41	0.41	0.41	0.41	0.41	0.40	0.39	0.38	0.37	0.36	0.35	0.33	0.32	0.31	0.30	0.28	0.27	0.26	0.24	0.23	0.22	0.20	0.19	0.18	0.16	0.15	0.13	0.12	0.11	0.09	0.08	0.06	0.05	0.03	0.02
Sub-total	35.81	0.00	0.00	-0.15	-0.08	-0.05	-0.05	0.26	0.27	0.27	0.28	0.70	0.73	0.76	0.77	0.80	0.82	0.85	0.88	0.91	0.94	0.97	1.01	1.04	1.07	1.11	1.14	1.19	1.22	1.25	1.29	1.34	1.38	1.43	1.48	1.52	1.59	1.64	1.69	1.74	1.80
B Finances																																									
1. Project Loan	40.49	2.36	1.67	14.43	14.70	6.69	0.36	0.28																																	
2. Local fund	13.77	0.79	0.56	4.87	5.02	2.32	0.12	0.09																																	
Sub-total	54.26	3.15	2.23	19.30	19.72	9.01	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.33	0.00	0.00	0.15	0.08	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	14.54	0.02	0.04	0.18	0.33	0.39	0.41	0.15	0.14	0.14	0.13	0.86	0.84	0.81	0.80	0.77	0.75	0.72	0.69	0.66	0.63	0.60	0.56	0.53	0.49	0.46	0.43	0.37	0.35	0.32	0.28	0.23	0.18	0.14	0.09	0.05	0.00	0.00	0.00	0.00	0.00
Sub-total	14.87	0.02	0.04	0.33	0.41	0.44	0.46	0.15	0.14	0.14	0.13	0.86	0.84	0.81	0.80	0.77	0.75	0.72	0.69	0.66	0.63	0.60	0.56	0.53	0.49	0.46	0.43	0.37	0.35	0.32	0.28	0.23	0.18	0.14	0.09	0.05	0.00	0.00	0.00	0.00	0.00
Total Cash Inflow	104.94	3.17	2.27	19.48	20.05	9.40	0.89	0.78	0.41	0.41	0.41	1.56	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.56	1.57	1.57	1.56	1.57	1.57	1.57	1.57	1.56	1.57	1.57	1.57	1.59	1.64	1.69	1.74	1.80
APPLICATION OF FUNDS																																								
D Project disbursement	54.26	3.15	2.23	19.30	19.72	9.01	0.48	0.37																																	
E Total debt services																																									
1. Loan repayment	40.48											1.16	1.18	1.19	1.20	1.21	1.22	1.24	1.25	1.26	1.27	1.29	1.30	1.31	1.32	1.34	1.35	1.36	1.38	1.39	1.41	1.42	1.43	1.45	1.46	1.48	1.49	1.51	1.52	1.54	1.55
2. Interest paid	9.59	0.02	0.04	0.18	0.33	0.39	0.41	0.41	0.41	0.41	0.41	0.40	0.39	0.38	0.37	0.36	0.35	0.33	0.32	0.31	0.30	0.28	0.27	0.26	0.24	0.23	0.22	0.20	0.19	0.18	0.16	0.15	0.13	0.12	0.11	0.09	0.08	0.06	0.05	0.03	0.02
Sub-total	50.07	0.02	0.04	0.18	0.33	0.39	0.41	0.41	0.41	0.41	0.41	1.56	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.56	1.57	1.57	1.56	1.57	1.57	1.57	1.57	1.56	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57
Total Cash Outflow	104.33	3.17	2.27	19.48	20.05	9.40	0.89	0.78	0.41	0.41	0.41	1.56	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.56	1.57	1.57	1.56	1.57	1.57	1.57	1.57	1.56	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57
F Net Surplus Cash (A+C2)-E	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.12	0.17	0.23
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	72%	0%	0%	0%	0%	0%	0%	63%	66%	66%	68%	45%	46%	48%	49%	51%	52%	54%	56%	58%	60%	62%	64%	66%	69%	71%	73%	76%	78%	80%	82%	85%	88%	91%	94%	97%	101%	104%	108%	111%	115%
Cost recovery by water fee + subsidy ((A+C2)/E)	101%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	101%	104%	108%	111%	115%

ARAGATSOTN MARZ
Aparan District
No 52 Chqnagh

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	70.69	82.6%
	Subsidy	14.87	17.4%
	Total	85.56	100.0%
2	**Expenditure**		
	OM cost	34.88	40.8%
	Loan repayment	40.48	47.3%
	Interest paid	9.59	11.2%
	Surplus cash	0.61	0.7%
	Total	85.56	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																								
1. Investment Cost	36.61	2.30	1.64	13.23	13.07	5.78	0.33	0.26																																
2. Operation and Maintenance Cost																																								
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	1.86			0.02	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Electricity	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mantenance cost	7.08			0.08	0.16	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Pump replacement																	0.00															0.00									
Sub-total	18.06			0.34	0.44	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Total Outflow	54.67	2.30	1.64	13.57	13.51	6.26	0.81	0.74	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
B BENEFIT																																								
1. Water Tariff	44.44	0.00	0.00	0.19	0.37	0.46	0.47	0.80	0.82	0.85	0.88	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32
2. Subsidy	6.66	0.00	0.00	0.15	0.08	0.05	0.05	0.00	0.00	0.00	0.00	0.46	0.45	0.43	0.43	0.41	0.40	0.39	0.37	0.35	0.33	0.32	0.29	0.27	0.25	0.23	0.21	0.17	0.16	0.14	0.12	0.08	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Total Inflow	51.10	0.00	0.00	0.34	0.45	0.51	0.52	0.80	0.82	0.85	0.88	1.78	1.77	1.75	1.75	1.73	1.72	1.71	1.69	1.67	1.65	1.64	1.61	1.59	1.57	1.55	1.53	1.49	1.48	1.46	1.44	1.40	1.37	1.34	1.32	1.32	1.32	1.32	1.32	1.32
NET BENEFIT	-3.56	-2.30	-1.64	-13.2	-13.1	-5.8	-0.29	0.06	0.34	0.37	0.40	1.30	1.29	1.27	1.27	1.25	1.24	1.23	1.21	1.19	1.17	1.16	1.13	1.11	1.09	1.07	1.05	1.01	1.00	0.98	0.96	0.92	0.89	0.86	0.84	0.84	0.84	0.84	0.84	0.84

FIRR = -0.51%

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-15.60	-2.53	-1.80	-14.6	-14.4	-6.3	-0.32	0.03	0.34	0.37	0.40	1.30	1.29	1.27	1.27	1.25	1.24	1.23	1.21	1.19	1.17	1.16	1.13	1.11	1.09	1.07	1.05	1.01	1.00	0.98	0.96	0.92	0.89	0.86	0.84	0.84	0.84	0.84	0.84	0.84
	2	Capital cost 20% up	-19.04	-2.76	-1.97	-15.9	-15.7	-6.9	-0.36	0.01	0.34	0.37	0.40	1.30	1.29	1.27	1.27	1.25	1.24	1.23	1.21	1.19	1.17	1.16	1.13	1.11	1.09	1.07	1.05	1.01	1.00	0.98	0.96	0.92	0.89	0.86	0.84	0.84	0.84	0.84	0.84	0.84
2	1	OM cost 10% up	-13.41	-2.30	-1.64	-13.3	-13.1	-5.8	-0.34	0.01	0.29	0.32	0.35	1.25	1.24	1.22	1.22	1.20	1.19	1.18	1.16	1.14	1.12	1.11	1.08	1.06	1.04	1.02	1.00	0.96	0.95	0.93	0.91	0.87	0.84	0.81	0.79	0.79	0.79	0.79	0.79	0.79
	2	OM cost 20% up	-14.68	-2.30	-1.64	-13.3	-13.1	-5.8	-0.39	-0.04	0.24	0.27	0.30	1.20	1.19	1.17	1.17	1.15	1.14	1.13	1.11	1.09	1.07	1.06	1.03	1.01	0.99	0.97	0.95	0.91	0.90	0.88	0.86	0.82	0.79	0.76	0.74	0.74	0.74	0.74	0.74	0.74
3	1	Revenue 10% down	-15.64	-2.30	-1.64	-13.3	-13.1	-5.8	-0.34	-0.02	0.26	0.29	0.31	1.12	1.11	1.10	1.10	1.08	1.07	1.06	1.04	1.02	1.01	1.00	0.97	0.95	0.93	0.92	0.90	0.86	0.85	0.83	0.82	0.78	0.75	0.73	0.71	0.71	0.71	0.71	0.71	0.71
	2	Revenue 20% down	-19.13	-2.30	-1.64	-13.3	-13.1	-5.9	-0.39	-0.10	0.18	0.20	0.22	0.94	0.94	0.92	0.92	0.90	0.90	0.89	0.87	0.86	0.84	0.83	0.81	0.79	0.78	0.76	0.74	0.71	0.70	0.69	0.67	0.64	0.62	0.59	0.58	0.58	0.58	0.58	0.58	0.58

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.97%	-4.76	-21.01%
	2	Capital cost 20% up	-1.38%	-6.32	-15.82%
2	1	OM cost 10% up	-0.78%	-3.47	-28.83%
	2	OM cost 20% up	-1.06%	-5.19	-19.25%
3	1	Revenue 10% down	-1.31%	-6.12	-16.35%
	2	Revenue 20% down	-2.23%	-7.71	-12.96%