

**FINAL REPORT  
RAPID ASSESSMENT METHODOLOGY  
FOR WATER UTILITIES**

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By

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## Attachments

- A. Documents Requested Prior to Visit
- B. Institutional Assessment Interview Guide
- C. Financial Assessment Interview Guide
- D. Engineering Assessment Interview Guide
- E. Sample Table Shells
- F. Outline for Assessment Report
- G. Bibliography
- H. Analysis Matrix
- I. Atyrau Field Test Report

## **ABSTRACT**

USAID commissioned this task order for the development of a Rapid Assessment Methodology because of the need for a consistent methodology that USAID and its contractors can use in assessing vodokanals or water authorities in the Europe and Eurasia (E&E) region. The assessment collects and analyzes information in the institutional, financial and engineering areas. This assessment methodology is designed to be conducted in one or two week period by a two-person team—a water engineer and a person capable of conducting the financial and institutional assessment. This assessment methodology is focused only on drinking water and not on wastewater.

## **ACKNOWLEDGMENTS**

This draft report on the Rapid Assessment Methodology for Water Utilities was prepared by Michael Shea and Frank Schutz with a strong technical review by Fred Zobrist. Sam Coxson of PADCO reviewed drafts and contributed to the financial analysis component. We wish to thank Research Triangle Institute, PADCO, and Camp Dresser McKee International Inc. and Associates (CDM) for sharing water assessment materials with us and for providing the basis for our report. We also wish to thank Michael Gould of USAID for his strong support in both preparing the report and testing the methodology.



# **RAPID ASSESSMENT METHODOLOGY FOR WATER UTILITIES**

## **1 INTRODUCTION**

### **1.1 Overview and Purpose of the Assessment**

USAID commissioned this task order for the development of a Rapid Assessment Methodology because of the need for a consistent methodology that USAID and its contractors can use in assessing vodokanals or water authorities in the Europe and Eurasia (E&E) region. This assessment methodology is designed to be conducted in one or two weeks by a two-person team—a water engineer and a person capable of conducting the financial and institutional assessment. The assessment collects and analyzes data in three areas; institutional, financial and engineering. This assessment methodology is focused only on drinking water and not on wastewater.

### **1.2 Use of the Assessment**

This assessment methodology can be used to quickly identify problem areas in vodokanals. It can also be used to identify areas where technical assistance or training would be useful. This methodology is not detailed enough to provide a complete financial picture of the vodokanal for a multilateral lender such as the World Bank or European Bank for Reconstruction and Development. The analysis matrix contained in Attachment H contains additional questions and data elements that can be utilized in a longer and more in-depth assessment. The results of the assessment report should be useful to the vodokanal in making themselves more efficient.

### **1.3 Approach**

The approach is to conduct a rapid assessment of a specific vodokanal. The team that is conducting the assessment should coordinate with the USAID Mission responsible for the vodokanal. If the vodokanal is larger than a certain size (which may vary by country), USAID should obtain permission to collect data from the vodokanal from the national government. The contractor for the assessment should send a letter to the vodokanal, the city and the oblast prior to the visit, explaining the purpose of the visit and requesting that certain information be available at the initial meeting with the vodokanal (see Attachment A).

During the week or two spent with the vodokanal, the team will review the requested information, conduct interviews, analyze the information, ask follow-up questions, and prepare a report. The objective is to have a written report at the end of the assessment period that the team can submit to USAID.

### **1.4 Team Composition**

The team is composed of two expatriate staff. One staff person is a water engineer who preferably has worked in Russian-controlled vodokanals and understands the systems and equipment used by the Russians. The second staff person has strong financial assessment skills,

good institutional experience, and has also worked with Russian system vodokanals. Each of these two professionals should be accompanied by an interpreter. If one interpreter is an engineer, and the other one has strong accounting skills, you can have a professional four-person team instead of simply having two professionals and two interpreters. If resources are available, it would be good to have three strong local professionals on the team – an engineer, an institutional expert and a financial or accounting expert.

### **1.5 Major Steps in the Assessment Process**

After the identification of the vodokanal that will be visited, it is important that the assessment team follow a series of steps in conducting the rapid assessment:

1. Coordinate closely with the USAID Mission for arrangements with the vodokanal and country clearance at least three weeks in advance.
2. Send a letter to the director of the vodokanal, the city and the oblast a month in advance. This letter has three purposes:
  - a. To identify the team, the purpose of the visit, and the types of data that will be collected
  - b. To tell the vodokanal and city how this visit will be to their benefit e.g. more TA etc.
  - c. To request documents that the team would like to have available at the beginning of the visit (see Attachment A).
3. Send out the three interview guides (Attachment B, C and D) and table shells (Attachment E) and get them translated locally if possible three weeks in advance of the visit.
4. Check on any security issues and whether national level approval is needed because of the size of the vodokanal.
5. Recruit the interpreters/translators and local experts for the visit a month in advance.
6. Make the travel arrangements ensuring that the team arrives in good time on Sunday so that work can begin on Monday morning.
7. Set up a brief kickoff meeting for Sunday evening or early Monday morning to meet with the interpreters and plan the activities for the day.
8. Try to schedule the key interviews in advance of the visit to ensure that the right staff are available to be interviewed.
9. Hold a meeting with the director of the vodokanal and the whole assessment team to explain the team's activities and gain his or her cooperation.
10. Begin the interviews with the director and other key staff at the vodokanal.
11. Conduct the week's activities roughly following the chart in section 1.6 below.
12. Prepare an assessment report by the end of the week and submit it to USAID.

### **1.6 Typical Schedule**

Figure 1 presents a typical rapid assessment schedule for data collection and report preparation. The actual schedule may vary because of circumstances at the site. For this schedule to be feasible, it is crucial to request certain materials prior to the visit so that they will be available at the beginning of the visit.

**Figure 1. On-Site Process for Rapid Assessment Methodology**

<b>Assessment Areas</b>	<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>	<b>Day 4</b>	<b>Day 5</b>
<b>Institutional</b>	<ol style="list-style-type: none"> <li>1. Interview vodokanal director and key staff (2-3 hours)</li> <li>2. Collect charter</li> <li>3. Collect local and national laws</li> </ol>	<ol style="list-style-type: none"> <li>1. Collect other material identified on Day 1</li> <li>2. Translate documents</li> <li>3. Interview other key staff (1-2 hours)</li> </ol>	<ol style="list-style-type: none"> <li>1. Translate documents</li> <li>2. Review charter and laws</li> <li>3. Interview key city officials</li> </ol>	<ol style="list-style-type: none"> <li>1. Interview staff with follow-up questions (2 hours)</li> <li>2. Begin writing institutional section</li> </ol>	<ol style="list-style-type: none"> <li>1. Write institutional section of report</li> </ol>
<b>Financial</b>	<ol style="list-style-type: none"> <li>1. Kick-off meeting with Director</li> <li>2. Interview finance director and his/her key staff (2-3 hours)</li> <li>3. Collect key financial documents</li> </ol>	<ol style="list-style-type: none"> <li>1. Translate financial documents</li> <li>2. Collect additional financial documents</li> <li>3. Review translated documents</li> </ol>	<ol style="list-style-type: none"> <li>1. Interview staff with follow-up questions (1-2 hours)</li> <li>2. Translate documents</li> </ol>	<ol style="list-style-type: none"> <li>1. Input financial data into table shells</li> </ol>	<ol style="list-style-type: none"> <li>1. Analyze data</li> <li>2. Write financial sections of report</li> </ol>
<b>Engineering</b>	<ol style="list-style-type: none"> <li>1. Interview vodokanal director and key staff (3 hours)</li> <li>2. Collect documents requested in letter</li> <li>3. Begin translation of documents</li> </ol>	<ol style="list-style-type: none"> <li>1. Collect additional documents from vodokanal</li> <li>2. Inspect treatment facilities</li> <li>3. Conduct flow tests</li> </ol>	<ol style="list-style-type: none"> <li>1. Interview staff with follow-up questions (1-2 hours)</li> <li>2. Inspect pumping stations</li> <li>3. Continue flow tests</li> <li>4. Translate documents</li> </ol>	<ol style="list-style-type: none"> <li>1. Interview staff with follow-up questions (1-2 hours)</li> <li>2. Inspect more pumping stations</li> <li>3. Review laboratory operations and results</li> </ol>	<ol style="list-style-type: none"> <li>1. Write engineering sections of report</li> </ol>

## **2 INSTITUTIONAL ASSESSMENT**

### **2.1 Approach**

The institutional assessment reviews the existing corporate legal structure, organizational structure, and working relationships with the municipality and enforcement and regulatory agencies. The interview guide for the institutional assessment is contained in Attachment B.

The key documents requested prior to the visit should be available on the first day of the visit. The team should also try to schedule the key interviews in advance of the visit to ensure that the right staff are available to be interviewed. First, the complete assessment team should meet with the vodokanal director and his key staff to receive his clear endorsement for the assessment. After the initial meeting, the team breaks up and conducts the subject matter interviews with the appropriate staff. The institutional team should also try to interview an attorney employed by or affiliated with the vodokanal for a legal opinion on the vodokanal's status.

#### **2.1.1 Corporate Legal Structure**

The current legal structure of the vodokanal needs to be clearly described. This description involves a review of the charter creating the vodokanal enterprise, other legal documents such as a contract or service agreement between the city and the vodokanal, and a lease or other documents granting the use of vodokanal assets.

#### **2.1.2 Tariff Regulatory Process**

The regulatory environment under which vodokanals operate is crucial to their transition to greater self-sufficiency. It is necessary to review the tariff setting process, the tariff structure, and the general policy toward increasing the tariffs. It is important that the tariffs provide for full cost recovery, provide funds for repairs and maintenance, and provide for capital improvements. The frequency of tariff approvals also needs to be reviewed in conjunction with inflation rates in the country and whether the increases are keeping up with inflation, energy costs, and wages.

#### **2.1.3 Customer Base Analysis**

The institutional team should review the data provided on the customer base, determining the general consumption patterns based on billed water volume and revenue by customer type. Cross-subsidies from enterprises to residential households should be carefully reviewed. The team should also compare customer types with levels of offsets and barter.

#### **2.1.4 Organizational Structure**

The vodokanal organizational structure should be reviewed in three major components:

1. Management and administration
  - organization chart
  - management span of control and strategic planning
2. Financial and accounting
  - accounting policies and practices
  - billing and collection
  - accounts receivable and accounts payable
3. Human resource management
  - number of employees and average wage
  - training, filling of vacancies, and promotion.

The assessment of these areas will provide the basis for recommendations on organizational change and more efficient operations.

#### **2.2 Staff To Be Interviewed**

The staff of the vodokanal that should be interviewed by the institutional team include; the director, legal counsel, public relations staff, and the human resources director. In addition, the team should interview the mayor or the deputy mayor responsible for relating to the vodokanal.

#### **2.3 Documents To Be Reviewed**

The key documents that the institutional team needs to review include national and local laws that affect the vodokanal operations and tariffs, a map of the service area, the organization chart, the vodokanal's charter, and the vodokanal's bylaws (if they have them).

### **3 FINANCIAL ASSESSMENT**

#### **3.1 Approach**

The person conducting the financial assessment needs to collect the financial reports requested in the letter to the vodokanal. The interview guide for the financial assessment is contained in Attachment C. Sample table shells to use in presenting the financial data are displayed in Attachment E. The assessor should review existing accounting policies and reporting and should also review and analyze the current tariff structure to determine:

- Whether full cost recovery is being achieved
- Whether sufficient funds are provided for maintenance and repairs
- Whether the current tariff is sufficient to provide for capital improvements.

Another key issue is the level of collections for services. The level of collections for each major customer type needs to be analyzed as well as whether customers pay in cash, offsets, or barter. The vodokanal's treatment of depreciation and valuation of assets also needs to be clarified because they directly affect the balance sheet and income statement.

Most countries in the E&E region follow Russian accounting standards, which focus on adherence to tax codes as opposed to international accounting standards, which focus on financial performance. The balance sheet and income statement need to be restated according to international accounting standards. By incorporating the Russian accounting codes directly into Table 3 (see Attachment E), these numbers can be traced directly from the vodokanal's accounting books via the trial balance and connecting table to the restated balance sheet.

After collecting and analyzing the data, the assessor should fill out the table shells in Attachment E. The analysis should include assessments of accounts receivable, accounts payable, aging of accounts receivable and accounts payable, expenditure trends, and taxes for the vodokanal.

### **3.2 Staff To Be Interviewed**

The key staff person for the financial assessment is the finance director and accounting staff of the vodokanal. Accounting department staff may provide guidance on accounting policies, practices, and reporting. If the city has a role in managing the vodokanal, the assessor should also interview the city finance director.

### **3.3 Documents To Be Reviewed**

The financial documents that need to be reviewed include:

- Annual reports for the past two years
- Profit and loss statements for the past two years
- Other financial reports for the past two years.

## **4 ENGINEERING ASSESSMENT**

### **4.1 Approach**

The engineering assessment will be conducted by an engineer and interpreter who may also be an engineer. The interview guide for the engineering component is contained in Attachment D. The engineer needs to look for indicators of performance such as:

- The number of water line breaks per kilometer
- Cost per line break repair
- Water service per 24-hour period

- Water pressure for upper stories of multifamily units
- Water quality.

The engineer needs to assess the overall maintenance and the general system including:

- Average age of the pipe network system and treatment plants
- Presence or absence of a preventive maintenance program
- Storage capacity and coverage for growth
- Energy consumption and cost reduction programs.

#### **4.2 Staff To Be Interviewed**

The director of operations and maintenance is the key person to be interviewed. The engineer may also interview staff at the treatment facility, maintenance staff, and staff at the laboratory.

#### **4.3 Documents To Be Reviewed**

Engineering assessment documents that the engineer needs to review include:

- Distribution system map
- Pressure differentials within the system
- Flow rates over a 24-hour period.

#### **4.4 Tests To Be Conducted**

The first key test that the assessor should conduct is to measure the flow of water between the distribution center and the end users to determine the amount of water loss. Many vodokanals simply use the national norm for water loss, which may be around 25 percent. The real water loss is likely to be between 40 and 70 percent. If the vodokanal has a good metering system, the flow and losses should be relatively easy to estimate. If there is little or no metering, the assessor can use a portable flow meter.

A second test is on water quality. The assessor can check for color and smell, but other quality tests need to be conducted by a laboratory. It is best if the vodokanal has a laboratory that can check the water quality out of the residential tap. There probably will not be time in a one-week assessment to have outside laboratory checks on the water.

### **5. RESULTS OF THE PEER REVIEW AND FIELD TEST**

#### **5.1 Peer Review Meeting**

A meeting was conducted on January 7, 2000 to review the draft methodology report with USAID and two contractors that conduct water assessments; PADCO and Research Triangle Institute. Michael Gould and Judith Hanson were representing USAID.

The peer reviewers made a number of suggestions including:

1. It is important to get the interviews guides and information requests to the vodokanal several weeks in advance of the field visit
2. The assessment team should have a full time translator for the legislation review
3. Three local experts should be added to the assessment team in the institutional, financial and engineering areas
4. It is important to check on the protocol for obtaining access to the vodokanal well in advance of the visit
5. The data collection plan appears very ambitious and might be good to highlight a minimum set of questions that are important to have answered
6. It is important to define a clear incentive or carrot for the vodokanal to participate in the assessment
7. It is important to be aware of the national context for the regulation of vodokanals
8. One reviewer that there should be more emphasis in the interview guides on customer service, scheduled maintenance and Operations and Maintenance, and the lines of responsibility between the city and the vodokanal
9. Another reviewer thought that a set of indicators with scores for performance against the indicators would be useful

## **5.2 Field Test Results**

The field test took place in Atyrau, Kazakhstan during the first week in February 2000. The field test was conducted by Michael Shea and Frank Schutz. Preliminary data was collected by Aman Tulepov, an ICMA representative in Atyrau. The three interview guides and financial table shells were sent out several weeks in advance of the visit and translated into Russian. The interview guides were completed by the vodokanal with constant follow up by the ICMA representative. With the completed interview guides and table shells, we were able to complete the assessment and prepare a written report in one week. If the interview guides were not completed prior to the field visit, the assessment would probably take close to two weeks to complete. The Atyrau field test report is included as Attachment I.

**ATTACHMENT A**  
**DOCUMENTS REQUESTED PRIOR TO THE VISIT**

1. National and local laws that affect the vodokanal operations and tariffs
2. Map of the service area
3. Vodokanal organization chart
4. City organization chart if vodokanal is part of the city government
5. The vodokanal charter
6. The vodokanal bylaws (if they have them)
7. Agreements between the city and the vodokanal – service agreements
8. Annual Reports for the past two years
9. Profit and Loss Statement
10. Financial Reports
11. Distribution system map
12. Pressure differentials within the system
13. Flow rates over a 24 hour period
14. Total production of drinking water – estimated or metered



**ATTACHMENT B**  
**INSTITUTIONAL ASSESSMENT INTERVIEW GUIDE**

## Institutional Interview Guide

**Date of interview** \_\_\_\_\_

**Name of respondent(s)** \_\_\_\_\_

**Title(s) of respondents** \_\_\_\_\_

Question	Responses
1. What is the legal form of the enterprise? a. joint stock company b. municipal owned – budgetary department c. limited liability company d. department of oblast e. other _____	
2. What is the law devolving the vodokanal from the national government and setting the powers and authority of the vodokanal? Get a copy of the law	
3. Who owns the vodokanal? a. Employees b. Municipality c. Oblast d. National government e. Private company f. Other _____	
4. Get a copy of the annual report for the last two years	
5. Please provide a copy of the company charter	
6. How is the director of the vodokanal appointed?	
7. Who conducts financial planning for the vodokanal?	

Question	Responses
8. How is the vodokanal organized? Get a copy of the organization chart	
9. Is there a service agreement between the vodokanal and the municipality? 10. If so, how often is the contract negotiated? 11. Who negotiates the Agreement? 12. How does the municipality monitor the Agreement? 13. Who approves the final Agreement? 14. How often is the Agreement renegotiated?	
15. What type of agreement is there between the City and the vodokanal regarding the use of assets and facilities? a. property transfer b. lease agreement	
16. What services are provided by the vodokanal? a. Drinking water b. Waste water c. Construction d. Laboratory e. Other _____	
17. Are there plans to expand the services provided?	
18. Are there plans to outsource any services?	
19. What is the vodokanal's service availability policy? a. Connection fees? b. Who may receive service?	
20. Are residential units and businesses required to connect to central water when it is available?	
21. What is the policy regarding construction of mains for customers who wish to have services extended to their premises?	
22. What is the current service area of the vodokanal? Get a map of the service area	

Question	Responses																				
23. Does a Zhek, or some other third party, represent some of your general population customers?																					
24. Number of customers by category for the past three years-number and volume <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Type</th> <th style="text-align: center;">Year 1</th> <th style="text-align: center;">Year 2</th> <th style="text-align: center;">Year 3</th> </tr> </thead> <tbody> <tr> <td>a. Residential</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>b. Industrial</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>c. Other communities</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>d. Other</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>	Type	Year 1	Year 2	Year 3	a. Residential	_____	_____	_____	b. Industrial	_____	_____	_____	c. Other communities	_____	_____	_____	d. Other	_____	_____	_____	
Type	Year 1	Year 2	Year 3																		
a. Residential	_____	_____	_____																		
b. Industrial	_____	_____	_____																		
c. Other communities	_____	_____	_____																		
d. Other	_____	_____	_____																		
25. Who are the largest industrial customers?																					
26. Do they pay their bills? 27. If not, how do you collect payment? 28. What percentage of your potential revenues do they represent?																					
29. What are the utility's plans to extend water within the existing service area?																					
30. What are the trends or projections of customer usage?																					
31. Who is responsible for customer service?																					

Question	Responses
32. Please provide a list of employees and responsibilities	
33. Who does the vodokanal director report to? Get an organization chart of the municipality if the city manages the vodokanal	
34. Are there written qualifications for each position or job category?	
35. How many staff does the vodokanal have?	
36. How many are management employees?	
37. How many are drinking water support employees?	
38. How many are support employees?	
39. How have the number of employees changed in the past five years?	
40. What is your employee turnover rate each year?	
41. Have wages been paid on a regular basis?	
42. What is the vodokanal policy on procurement?	
43. What procurement regulations apply to the vodokanal?	
44. What controls do you have on taking supplies form the storehouses?	
45. Describe the inventory ordering, release and control system.	

Question	Response
46. What indirect competition do you have? a. bottled water b. wells c. other	
47. Do you have any direct competition?	
48. Have you explored and are you planning institutional changes on your future status? a. BOT b. BOO c. Leasing d. Management contract e. Subcontracting services such as billings and receivables, construction repair and maintenance, or operations?	
49. Can water services be discontinued if customers do not pay? a. Residential b. Industrial c. Other	
50. Is there reliable electrical support for pumping equipment?	
51. How does the vodokanal inform customers about price changes, changes in billing, or interruptions in service?	
52. Do customers provide input to the vodokanal on prices, quality of service, and other vodokanal policies? If so, how many provide feedback	
53. Are there customer complaints about the water service or water quality? If so, what do you do about the complaints? What are the complaint areas?	
54. Are there any major projects or improvement programs in progress or in planning? If so, please provide a brief summary or description.	
55. Have studies of the vodokanal been completed in the last five years? If so, provide a copy of the report or a summary and the names and contact information of the authors.	
56. Does the vodokanal provide all of the components of drinking water service or are some components contracted out e.g. treatment?	

**ATTACHMENT C**  
**FINANCIAL ASSESSMENT INTERVIEW GUIDE**

## Financial Interview Guide

**Date of interview** \_\_\_\_\_ **City of Interview** \_\_\_\_\_

**Name(s) of Respondents** \_\_\_\_\_

**Title(s) of Respondents** \_\_\_\_\_

<b>Question</b>	<b>Response</b>
1. What is the financial relationship between the vodokanal and the municipality and the oblast?	
2. Has the vodokanal been approached by investors who wish to have an ownership role in the vodokanal? Provide details	
3. Please describe and obtain a listing of the assets involved in drinking water supply with approximate value for each asset and depreciable life.	
4. List of vehicles and equipment not covered in the listing of assets with value.	
5. Does the vodokanal have surplus revenues?	
6. Does the vodokanal pay surpluses to the municipality?	
7. If so how and when are surpluses paid?	
8. How does the vodokanal finance capital improvements?	
9. Are audits of the vodokanal conducted?	
10. By whom?	
11. How frequent are the audits?	
12. What licenses are you required to have and what is the cost?	
13. What are your yearly taxes? a. Enterprise b. Excise c. Other	
14. Do you pay income taxes and social taxes?	
15. If yes, how much and to whom?	
16. What is the vodokanal policy on writing off bad or uncollectable debts?	

Question	Response
17. To what extent is customer usage metered?	
18. On what basis are customers billed?	
19. Can you provide an average days of accounts receivable outstanding by customer type? a. Residential b. Industrial c. Municipal d. Other	
20. What information is maintained in the vodokanal billing system?	
21. What are the general billing and payment terms by customer type? a. Residential b. Industrial c. Municipal d. other	
22. Does the vodokanal collect payment directly or through a bank or other party that collects the money and sends it to the vodokanal?	
23. What steps is the vodokanal taking to improve its accounts receivable?	
24. How often are billings done? Who prepares them?	
25. Does the vodokanal have outstanding debt? a. Amount(s) b. Lender(s) c. Terms and conditions d. Schedule of debt service for each loan	
26. Can debt servicing be deducted as an operating expense?	
27. Can debt servicing be included as part of the tariff price?	

Question	Response
28. What are the trends or projections for past due accounts and uncollectables?	
29. Is there local legislation for tariff approval for drinking water?	
30. Can you provide a schedule of prices or tariffs for the past two years?	
31. How often are prices increased?	
32. What is the basis for price increases?	
33. What is the approval process for price increases?	
34. What is the general public reaction to price increases?	
35. What are the current tariff rates for different groups of customers? a. General population b. Governmental c. Enterprise d. Industry e. Other	
35. Who initiates the tariff increases?	
36. Does the vodokanal receive capital expenses funding from: a. the municipality? b. The oblast? c. The national government? d. Bonds e. other _____ -	
37. If they receive capital expense subsidies, how often and how much in the past two years?	
38. Who approves the capital expense budget at the vodokanal?	
39. Obtain current years budget and next years budget	
40. Obtain capital investment plan	

Question	Response
41. Who prepares the annual budget for the vodokanal?	
42. Obtain current year, last year and next years' budget.	
43. What is the process and basis for preparing your operating budget?	
44. How will expansion of the service area or technology changes affect your operating budget?	
45. Obtain operating income statements for the past two years	
46. Total wages and number of employees	
47. Average wage	
48. Are there plans to increase or decrease employment? a. Based on expansion of services or service area b. based on outsourcing or privatization c. because of a lack of subsidies d. technology upgrades	
49. What is the policy on payment of bonuses? 50. How many bonus are paid each year and how much was paid over the past two years?	
51. What is the payroll tax rate? a. Social benefits b. income tax c. other	
52. Materials and expenses broken out by major line item. a. Gasoline expense? b. Electricity expenses? c. Chemical expense? d. Purchase water?	
53. What is the VAT rate and do you pay it on all purchases?	

Question	Response
54. How does management monitor operating expenses?	
55. Obtain balance sheets for the past two years.	
56. Statement of profit and loss	
57. Statement of revenues, expenses, and changes in retained earnings	
58. Does the vodokanal receive subsidies? a. from the municipality b. from the oblast c. from the national government d. other _____	
59. If subsidies are provided, how often and how much is provided?	
Does the vodokanal analyze variances between planned and actual costs?	
60. Does the vodokanal have investments?	
61. Is there an investment plan?	
62. What are the depreciation rates for different types of assets?	
Are financial transactions recorded on the computer?	
63. Is the accounting department computerized? How many?	
Are income based subsidies provided to families? Describe	
64. Have you paid any penalties for environmental violations in the past two years?	

**ATTACHMENT D**  
**ENGINEERING ASSESSMENT INTERVIEW GUIDE**

## Engineering Interview Guide

**Date of Interview** \_\_\_\_\_ **City of Interview** \_\_\_\_\_

**Name(s) of Respondents** \_\_\_\_\_

**Title(s) of Respondents** \_\_\_\_\_

<b>Question</b>	<b>Response</b>
1. Is there an adequate supply of water to meet present and future projected needs?	
2. What are your water sources? a. River b. Reservoir c. Springs d. Aquifer e. Infiltration galleries f. Other	
3. Is there a map raw water watershed or well field available?	
4. What is the quality of the raw water source? a. pure b. slight contamination c. heavy contamination d. don't know	
5. Are there specific contaminants such as: a. bacteria b. sediment c. color d. odor e. bad taste f. hardness g. industrial waste h. other	

Question	Response
6. If the raw water source is a river or reservoir, are there any upstream discharges? a. municipal b. industrial c. other	
7. If the raw water source is a wells, are they protected from surface contamination?	
8. What is the rated capacity of the raw water source?	
9. Is the raw water source yield equal, less than or greater than the normal and peak water demand?	
10. If the raw water source is not immediately adjacent to the treatment and distribution facility, how is it conveyed? a. pipeline b. open channel or canal c. gravity d. pumped	
11. What is the quality of water for the end user? a. Taste b. Color c. Bacteria	
12. Does the quality of finished water meet all standards and requirements?	
13. Has the vodokanal forecast demand for water? 14. If yes, get a copy of the forecast and support for conclusions.	
15. What is the extent of interruptions in service?	
16. What is the range of pressure throughout the day?	
17. What is the amount of storage as a percentage of average daily water use?	
18. What is the ratio of peak hour to average flow?	
19. What bacterias are present in the water for the end user?	

Question	Response
20. Is the water production metered? If not, how is production arrived?	
21. What is the percentage of accounted for water?	
22. Has the vodokanal reviewed the amount of water loss and does this match the amount of projected loss in the tariff calculation?	
23. What is the percentage of water loss?	
24. What is the national norm for water loss?	
25. Is water consumption metered? a. Residential b. budget organizations/municipal c. enterprise d. industrial	
26. Do you have a laboratory for testing water? 27. If not how do you test it? 28. How often do you test it?	
29. Is there a preventive maintenance program in place how much of it are you carrying out now?	
30. Has the vodokanal reviewed its system for efficiency improvements?	
31. Have there been other studies or assessments of the vodokanal in the last five years? Identify them and get copies	
32. What is your water treatment process?	
33. Does the water treatment meet national standards?	
34. Are the treatment processes utilized adequate to compensate for all known deficiencies in raw water quality?	
35. Is the rated capacity of the treatment facility equal, less than or greater than the peak system demand?	
36. Please name, describe and locate the treatment processes employed in the water purification process.	
37. What is the per capita consumption of water	

Question	Response
38. What is the percentage of population served by the vodokanal?	
39. If possible, please provide a flow plan and location plan for all processes used. Please show all process facility and equipment locations. Are the treatment units adequately sized so that all flows pass through all treatment processes at all times? Please indicate processes bypassed under high flow conditions.	
40. Disinfection of water (chemicals and processes used, location or locations of processes)	
41. Solids removal a. flocculation b. sedimentation c. filtration d. other	
42. How are removed solids and sludges treated and disposed of?	
43. What processes are used for water softening?	
44. How are bad colors removed?	
45. How is taste and odor controlled?	
46. Have there been customer complaints regarding: a. color b. odor c. taste d. hardness	
47. Are there problems in the distribution of water? a. pumping capacity b. line capacity c. lack of pressure in the residential buildings? d. Other	
48. How and where is finished water stored?	
49. What is the size of the distribution system(kilometers of pipe)?	

<b>Question</b>	<b>Response</b>
50. If possible please provide a map of the distribution system. Please indicate pipe diameters and lengths, materials of pipe construction, methods of joint construction, and age of lines	
51. Are pumps used to convey water through the distribution system? If so, what are there: a. sizes b. types ages	
52. Are there elevated or ground storage tanks located within the distribution system?	
53. What is the greatest elevation difference between customer locations within the distribution system?	
54. Is there more than one pressure zone? If so, please provide a map showing pressure zones.	
55. Have lost water surveys been conducted within the distribution system?	
56. Are estimates of water losses based on the national norms, estimates or actual flow measurements?	
57. Have hydraulic analysis (Hardy Cross etc.) been performed on the water distribution system?	
58. Please indicate the locations of all flow meters from the raw intake throughout the treatment facility and distribution system	
59. What type of flow meters are used? a. venturi b. propeller c. magnetic d. ultrasonic	
60. Are flow records available?	
61. Are customers water meters regularly tested and calibrated? 62. If so, are such tests scheduled in advance?	
63. What are the ages of major treatment and distribution facilities?	
64. Are there any treatment or distribution system problems which we should be aware of?	

**ATTACHMENT E**  
**SAMPLE TABLE SHELLS FOR FINANCIAL REPORTS**

## Rapid Assessment Methodology Tables

The following tables may be used to assess the level of collections, operations costs and cash flow for a water and wastewater utility. Here the focus is on the overall financial activity of the organization. It is assumed that the vodokanal does not break out revenues and expenses for water and wastewater. The table also assumes that the data can be aggregated sufficiently so that the difference between “pribil” and “rentablenost” is made. Both terms refer to profit but only the net amount of “pribil” is true profit—revenue after taxes and reserves, whereas “rentablenost” is revenue before taxes and reserves. Depreciation is a part of the reserves, at least in theory.

**Table 1. Vodokanal Profit and Loss for the Period**

Item	Year 1	Year 2	% Change
Water and Sewer Revenue			
Other Revenue			
Total Revenues			
Total Expenditures (excluding taxes and depreciation)			
Net Income Before Taxes and Depreciation			
Depreciation Expense			
Taxes			
Net Income/ (loss)			

**Table 2. Vodokanal Asset Sheet**

Assets	Year 1	Year 2	% Change
Current Assets			
Cash and equivalents			
Accounts Receivable			
Provision for Doubtful Accounts			
Intangible Assets			
Inventory			
Total Current Assets			
Fixed Assets			
Property, Plant and Equipment			
Uninstalled Equip.			
Work in Progress			
<b>Total Fixed Assets</b>			

## Balance Sheet

Assets are presented above because they have some special problems relative to asset revaluation and depreciation factors issued by the central government. Below is a balance sheet composed of account totals utilizing Russian accounting account numbers. This makes it easier for the accounting department to fill out the page. It also makes it easier for the consultant to cross check the totals.

**Table 3. Balance Sheet Correlation to Russian Account Numbers**

Russian Account Code	Balance Sheet Item	Notes	December 31, xxxx (in 000 rubles)	December 31, xxxx (in 000 rubles)
	Property, Plant and Equipment			
01	Fixed Assets			
02	Less Depreciation			
	Net Fixed Assets			
04, 06	Intangible Assets and Investments			
	Current Assets			
10, 12	Inventory			
19	VAT on Materials			
62,48,71,73,76	Accounts Receivable			
50,51,53,55	Bank and cash balances			
	Total Assets			
	Current Liabilities			
60,48,73,76	Accounts Payable			
90	Short-term loans			
70	Salaries Payable			
69,65,67,68	Social Taxes Payable			
68.3	VAT Payable on Accrued Income			
	Long Term Liabilities			
	Total Liabilities			
	Equity Capital			
85	Founding Capital			
	Revaluation Surpluses			
87.1	Development Funds			
87.2	Social Funds			
88	Capital Reserves			

**Table 4. Accounts Receivable—Aging**

Most Russian water utilities do not age accounts on the theory that all accounts are ultimately collectible especially governmental accounts. It is generally not possible to get the aging of the accounts receivable under rapid assessment unless the utility is already aging accounts. In case the vodokanal is aging, the following table is provided for the consultant's convenience.

Type Organization	Prior Period A/R	Current Period A/R	Amount in Local Currency	Amount in Current Dollars	Percent of Total A/R
Population					
Budget Organizations					
Enterprises					
Other					
Total					

**Table 5. Vodokanal Collection Analysis—By Year**

Activity	Year XX	Year XX	% Change
Billed for Water			
Collected Billings—Cash			
Offsets			
Barter			
Other			
Uncollected			

The billing should include VAT and collections should include VAT or break it out separately since much of the VAT is not collected in some accounts. "Other" may include subsidies.

**Table 6. Vodokanal Collection Analysis—by Customer Category**

Activity	Total for Year	General Population	Budget Organization	Enterprises	Other
Billed Water Supply					
Collected Billings-Cash					
Offsets					
Barter					
Other					
Total Collected					
% Collected of Billed					

**Table 7. Vodokanal Expense Comparison 2 years**

<b>Expense Category</b>	<b>Year XX</b>	<b>% of Total</b>	<b>Year XY</b>	<b>% of Total</b>	<b>% Increase XX to XY</b>
<b>Personnel Costs</b>					
Wages					
Pension Fund					
Medical Insurance					
Social Fund					
Unemployment Ins.					
Bonuses					
Total Personnel Costs					
<b>Production Expenses</b>					
Energy					
Materials and Chemicals					
Minor Repairs					
Maintenance					
Work Shop					
Miscellaneous Prod. Exp.					
Taxes (excluding profit and VAT)					
Short-term loans					
Total Production Exp.					
<b>Non-Production Expenses</b>					
Profit Taxes					
VAT*					
Fines, other Penalties					
Total Non-Production Expenses					
Depreciation Expense					
Total Expenses					

\*VAT is not always collected from the customer but must be paid to the central government by the utility; thus, it becomes an expense.

# **ATTACHMENT F**

## **OUTLINE FOR VODOKANAL ASSESSMENT REPORT**

1. Introduction
  - Objectives
  - Team composition
  - Time frame of assessment
  
2. Institutional Findings
  - Vodokanal staff interviewed
  - Legal structure
  - Obstacles to Financial and Operational Autonomy
  - Organizational Description
    - Staff size
    - Staff capacity
    - Staff skills
  - Management and Operations
    - Human Resources
    - Organization and Management
    - Finance Department
    - Computerization
    - Operations and Maintenance
    - Tariff Approval Process
  
3. Financial Findings
  - The Current Tariff for Drinking Water
  - Financial Overview
  - Financial Management Policies and Systems
    - Organization of the Accounting Department
    - Documentation
    - Financial Reports
    - Inventory Valuation
    - Depreciation Policies
    - Asset Management
    - Income Taxes and Social Taxes
    - Profit Tax and Other Taxes and Penalties
  - Financial Systems and Controls
    - Billing and Collection
    - Payroll System
    - Inventory Control System
    - Budgeting System
  - Vodokanal Profit and Loss
    - Profit and Loss Statement Analysis

Balance Sheet Analysis

Accounts Receivable

Bad Debt Estimate

Accounts Payable

The problem of non-cash transactions

Capital Expenses and How They Pay for Them

4. Engineering Findings

Water Quality

Laboratory Facilities and Use for Testing

Pumping Capacity

Water Loss Norms and Estimates

Water Treatment Procedures and Results

Water Sources

Water Service Operating Hours

Maintenance Systems

Extent of Metering

5. Recommendations

5.1 Institutional

Legal Reform

Organizational Reform

5.2 Financial

Billing and Collection System

Payroll System

Budgetary Control System

5.3 Engineering

## **ATTACHMENT G**

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**ATTACHMENT H**  
**ANALYSIS MATRIX**

**RAPID ASSESSMENT METHODOLOGY FOR WATER UTILITIES  
ANALYSIS MATRIX FOR ASSESSMENT**

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
Institutional-Legal	Legal status	What is the legal form of the enterprise? f. joint stock company g. municipal owned – budgetary department h. limited liability company i. department of oblast j. other _____	RTI/PADCO
	Legal authority from government	What is the law devolving the vodokanal from the national government and setting the powers and authority of the vodokanal? Get a copy of the law	PADCO
	Ownership	Who owns the vodokanal? g. Employees h. Municipality i. Oblast j. National government k. private company l. other _____ -	RTI/PADCO
	Annual report	Get a copy of the annual report for the last two years	PADCO
	Company charter or authorization	Please provide a copy of the company charter	RTI/PADCO
	Public information	Who is responsible for public information at the vodokanal?	RTI
	Public information	How does the vodokanal inform customers about price changes, changes in billing, or interruptions in service?	RTI/PADCO
	Public information	Do customers provide input to the vodokanal on prices, quality of service, and other vodokanal policies? If so, how many provide feedback.	RTI/PADCO
Institutional-organization	Staffing authority	How is the director of the vodokanal appointed?	RTI
	Staffing	Who conducts financial planning for the vodokanal?	PADCO

## H-4

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Organization	How is the vodokanal organized? Get a copy of the organization chart	RTI/PADCO
Institutional	Service Agreement	Is there a service agreement between the vodokanal and the municipality? If so, how often is the contract negotiated? Who negotiates the Agreement? How does the municipality monitor the Agreement? Who approves the final Agreement? How often is the Agreement renegotiated?	RTI?PADCO
	Agreement with city	What type of agreement is there between the City and the vodokanal regarding the use of assets and facilities? c. property transfer d. lease agreement	PADCO
	Services provided	What services are provided by the vodokanal? f. Drinking water g. Waste water h. Construction i. Laboratory j. Other_____	RTI/PADCO
	Services	Are there plans to expand the services provided?	RTI/PADCO
	Services	Are there plans to outsource any services?	RTI/PADCO
	Services	What is the vodokanal's service availability policy? c. Connection fees? d. Who may receive service?	RTI
	Services	Are residential units and businesses required to connect to central water when it is available?	RTI
	Services	What is the policy regarding construction of mains for customers who wish to have services extended to their premises?	RTI
	Service area	What is the current service area of the vodokanal? Get a map of the service area	RTI/PADCO
	Service area	Are there plans to expand the service area?	RTI/PADCO
	Service area	What are the restrictions to expansion?	RTI

H-5

Category	Data Element	Question	Source
	Services	Does a Zhek, or some other third party, represent some of your general population customers?	PADCO
	Customer profile	Number of customers by category for the past three years-number and volume Type    Year I    Year 2    Year 3 e. Residential    _____    _____    _____ f. Industrial    _____    _____    _____ g. Other communities    _____    _____    _____ h. Other    _____    _____    _____	RTI/PADCO
	Customer profile	Who are the largest industrial customers?	RTI/PADCO
	Customer profile	Do they pay their bills? If not, how do you collect payment? What percentage of your potential revenues do they represent?	ICMA
	Customer profile	What percentage of households and business in the service area are connected to the water system?	RTI
	Customer profile	Are individual homes and industries allowed to have wells?	RTI
	Customer profile	Can they have wells were central water is available?	RTI
	Customer profile	What are the utility's plans to extend water within the existing service area?	RTI/PADCO
	Customer profile	What are the trends or projections of customer usage?	RTI
	Customer service	Who is responsible for customer service?	RTI/PADCO
	Customer service	How is the customer service function defined?	RTI/PADCO
	Customer service	What is the policy regarding resolution of customer complaints? How are customer complaints handled? Is there a log of customer complaints?	RTI/PADCO
	Customer service	Has the vodokanal conducted customer surveys? If yes, what are the results? What was the survey process and number of respondents?	RTI
	Customer service	What are the service standards of the vodokanal? How are customers made aware of the standards?	RTI

## H-6

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Human resource	Please provide a list of employees and responsibilities	RTI
	Human resource	Is the number of workers employed in each area adequate?	RTI
	Human resource	Are there regulations that affect the numbers of employees needed for different areas of work?	RTI/PADCO
	Human resource	Are there regulations that affect the qualifications of workers in each area of work?	RTI/PADCO
	Human resource	What are the work schedules for each activity?	RTI
	Human resource	How are employees trained?	RTI
	Human resource	What is the average wage of workers?	RTI
	Human resource	Does this average wage compare well to other potential jobs in the community?	RTI
	Human resource	Do you have a staff turnover problem?	ICMA
	Human resource	Is the average wage adequate to hire qualified workers?	RTI
	Human resource	Who does the vodokanal director report to? Get an organization chart of the municipality if the city manages the vodokanal	RTI/PADCO
	Human resource	Are there written qualifications for each position or job category?	PADCO
	Human resource	Who hires and fires the staff?	ICMA
	Human resource	Does the vodokanal have written personnel policies?	PADCO
	Human resource	What city, oblast or national regulations apply to personnel management of the vodokanal?	PADCO
	Human resource	How many staff does the vodokanal have?	PADCO
	Human resource	How many are management employees?	PADCO
	Human resource	How many are drinking water support employees?	PADCO
	Human resource	How many are support employees?	PADCO
	Human resource	How have the number of employees changed in the past five years? What is your employee turnover rate each year?	PADCO CDM
	Human resource	Have wages been paid on a regular basis?	PADCO
	Human resource	How many are support employees?	PADCO

## H-7

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Human resource	Is there a staff training program to upgrade skills?	PADCO
	Human resource	How are employees made aware of the standards?	
	Competition	What indirect competition do you have? d. bottled water e. wells f. other	RTI
	Competition	Do you have any direct competition?	RTI
	Competition	What are the trends or projections for competition in your market?	RTI
	Future status/privatization	Have you explored and are you planning institutional changes on your future status? f. BOT g. BOO h. Leasing i. Management contract j. Subcontracting services such as billings and receivables, construction repair and maintenance, or operations?	RTI
	Collection	What are the local and national regulations regarding collections and enforcement?	RTI/PADCO
	Enforcement/collection	Can water services be discontinued if customers do not pay? d. Residential e. Industrial f. Other	RTI
	Construction contracts	Who awards construction contracts?	PADCO
	Construction contracts	Who supervises the performance on construction contracts?	PADCO
	Electricity support	Is there reliable electrical support for pumping equipment?	PADCO

## H-8

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Procurement	What is the vodokanal policy on procurement?	RTI/PADCO
	Procurement	Who is responsible for purchasing fixed assets, materials, and supplies and ordering them?	RTI/PADCO
	Procurement	What is the procedure for issuing purchase orders and buying equipment?	RTI
	Procurement	What procurement regulations apply to the vodokanal?	RTI
	Procurement	Do you have competitive procurements for major equipment purchases and construction projects?	ICMA/PADCO
	Inventory management	What is the vodokanal policy on inventory levels?	RTI/PADCO
	Inventory management	How many storehouses are there in the vodokanal?	RTI
	Inventory management	What controls do you have on taking supplies from the storehouses? Describe the inventory ordering, release and control system.	RTI/PADCO
	Inventory management	Who is responsible for inventory control?	RTI/PADCO
	Inventory management	How frequently are physical inventories taken?	RTI/PADCO
	Inventory management	What is done with obsolete inventory?	RTI

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
Financial	Financing	What is the financial relationship between the vodokanal and the municipality and the oblast?	RTI/PADCO
	Ownership	Has the vodokanal been approached by investors who wish to have an ownership role in the vodokanal? Provide details	RTI
	Assets	Who is responsible for approving and purchasing fixed assets for the vodokanal?	RTI/PADCO
	Assets	Please describe and obtain a listing of the assets involved in drinking water supply with approximate value for each asset and depreciable life.	RTI/PADCO
	Assets	Planned upgrades and replacements	RTI
	Assets	List of vehicles and equipment not covered in the listing of assets with value.	RTI/PADCO
	Assets	What is the maintenance policy on major equipment?	RTI/PADCO
	Assets	What is the maintenance policy on vehicles?	RTI/PADCO
	Assets	What is the replacement policy on major equipment and vehicles?	RTI
	Assets	Does the vodokanal conduct a cost/benefit analysis to justify purchases of equipment and vehicles?	RTI
	Surplus of revenues	Does the vodokanal have surplus revenues? Does the vodokanal pay surpluses to the municipality? If so how and when are surpluses paid?	RTI/PADCO
	Insurance	Do you have insurance on operations, vehicles and equipment and what is the cost?	RTI
	Insurance	Does insurance need to be increased or decreased?	RTI
	Taxes	What are your yearly taxes? d. enterprise e. excise f. other	RTI/PADCO
	Income taxes	Do you pay income taxes and social taxes? If yes, how much and to whom?	RTI/PADCO
	Write offs	What is the vodokanal policy on writing off bad or uncollectable debts?	RTI/PADCO

H-10

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Billings	To what extent is customer usage metered?	RTI/PADCO
	Billings	On what basis are customers billed?	RTI/PADCO
	Billings	Can you provide a schedule of revenues by customer type? % cash a. Residential b. Industrial c. Municipal d. Other	RTI/PADCO
	Billings	Can you provide an average days of accounts receivable outstanding by customer type? e. Residential f. Industrial g. Municipal h. Other	RTI/PADCO
	Billings	What information is maintained in the vodokanal billing system?	RTI/PADCO
	Billings	What are the general billing and payment terms by customer type? d. Residential e. Industrial f. Municipal d. other	RTI
	Billings	Does the vodokanal collect payment directly or through a bank or other party that collects the money and sends it to the vodokanal?	PADCO
	Billings	What steps is the vodokanal taking to improve its accounts receivable?	PADCO
	Billings	How often are billings done? Who prepares them?	PADCO
	Debt	Does the vodokanal have outstanding debt? e. amount(s) f. lender(s) g. terms and conditions h. schedule of debt service for each loan	RTI/PADCO
	Debt servicing	Can debt servicing be deducted as an operating expense?	PADCO
	Debt servicing	Can debt servicing be included as part of the tariff price?	PADCO

H-11

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Past due accounts	What are the trends or projections for past due accounts and uncollectables?	RTI
	Tariffs/Prices	Is there local legislation for tariff approval for drinking water?	PADCO
	Tariffs/Prices	Can you provide a schedule of prices or tariffs for the past two years?	RTI/PADCO
	Tariffs/Prices	How often are prices increased?	RTI/PADCO
	Tariffs/Prices	What is the basis for price increases?	RTI/PADCO
	Tariffs/Prices	What is the approval process for price increases?	RTI/PADCO
	Tariffs/Prices	What is the general public reaction to price increases?	RTI
	Tariffs/Prices	How do prices at this vodokanal compare to prices in neighboring communities and the national average	PADCO
	Tariffs/Prices	What are the current tariff rates for different groups of customers? f. General population g. Governmental h. Enterprise i. Industry j. Other	PADCO
	Tariffs/Prices	Does the current tariff provide incentives for the reduction of costs and services?	PADCO
	Tariffs/Prices	Who initiates the tariff increases?	PADCO
	Capital expense	Does the vodokanal receive capital expenses funding from: a. the municipality? f. The oblast? g. The national government? h. Bonds i. other _____-	RTI/PADCO
	Capital expense	If they receive capital expense subsidies, how often and how much in the past two years?	RTI/PADCO
	Capital expense budget	Who approves the capital expense budget at the vodokanal?	RTI/PADCO
	Capital investment budget	Obtain current years budget and next years budget	RTI/PADCO
	Capital investment plan	Obtain capital investment plan	RTI/PADCO

## H-12

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Operating budget	Who prepares the annual budget for the vodokanal?	ICMA
	Operating budget	Who approves the vodokanal budget?	RTI/PADCO
	Operating budget	Obtain current year, last year and next years' budget.	RTI/PADCO
	Operating budget	What is the process and basis for preparing your operating budget?	RTI/PADCO
	Operating budget	What are the trends in the operating budget?	RTI
	Operating budget	How will expansion of the service area or technology changes affect your operating budget?	RTI
	Operating income	Obtain operating income statements for the past two years	RTI/PADCO
	Operating expenses	Total wages and number of employees	RTI/PADCO
	Operating expenses	Average wage	RTI
	Operating expenses	What is the basis and frequency of wage increases?	RTI
	Operating expenses	Are there plans to increase or decrease employment? e. based on expansion of services or service area f. based on outsourcing or privatization g. because of a lack of subsidies h. technology upgrades	RTI/PADCO
	Operating expenses	What is the policy on payment of bonuses? How many bonus are paid each year and how much was paid over the past two years?	RTI
	Operating expenses	What is the payroll tax rate? d. social benefits e. income tax f. other	RTI/PADCO
	Operating expenses	Materials and expenses broken out by major line item. e. Gasoline expense? f. Electricity expenses? g. Chemical expense? h. Purchase water?	RTI/PADCO
	Operating expenses	What is the VAT rate and do you pay it on all purchases?	RTI/PADCO

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Operating expenses	Do you have contract payments to outside firms and vendors? Please list payments and services a. Repair and maintenance services b. Contract payments to staff	RTI/PADCO
	Operating expenses	What are your travel expenses?	RTI/PADCO
	Operating expenses	How does management monitor operating expenses?	PADCO
	Balance sheets	Obtain balance sheets for the past two years.	RTI/PADCO
	Profit and loss	Statement of profit and loss	PADCO
	Statement of revenues	Statement of revenues, expenses, and changes in retained earnings	PADCO
	Statement of financial position	A statement of financial position that reports assets, liabilities, and fund equity as of the end of the last fiscal period.	PADCO
	Subsidies for operating	Does the vodokanal receive subsidies? a. form the municipality e. from the oblast f. from the national government g. other _____	RTI/PADCO
	Subsides for operating	If subsidies are provided, how often and how much is provided?	RTI/PADCO
	Planned and actual expenses	Does the vodokanal analyze variances between planned and actual costs?	PADCO
	Investment plan	Does the vodokanal have investments? Is there an investment plan?	PADCO
	Investment to meet demand	What investment is needed to meet the current and projected demand for water supply?	RTI
	Investment	If it does not meet national standards, what investment is required to enable the vodokanal to meet national standards?	RTI
	Depreciation	What are the depreciation rates for different types of assets?	PADCO
	Computer use	Are financial transactions recorded on the computer?	PADCO
	Computer use	Is the accounting department computerized? How many?	PADCO
	Subsidies to families	Are income based subsidies provided to families? Describe	PADCO
	Penalties	Have you paid any penalties for environmental violations in the past two years?	RTI/PADCO

## H-14

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Capital improvement financing	How does the vodokanal finance capital improvements?	RTI/PADCO
	Capital improvement financing	Does the vodokanal plan to borrow to finance capital improvements? Provide details	RTI/PADCO
	Capital improvement financing	Has the vodokanal issued stock to finance capital improvements? Does it plan to issue stock to finance improvements?	RTI
	Audits	Are audits of the vodokanal conducted? By whom?	PADCO
	Audits	How frequent are the audits?	PADCO
	Licenses	What licenses are you required to have and what is the cost?	RTI

H-15

Category	Data Element	Question	Source
Engineering	Water supply	Is there an adequate supply of water to meet present and future projected needs?	RTI
	Water source	What are your water sources? g. River h. Reservoir i. Springs j. Aquifer k. Infiltration galleries l. Other	RTI
	Water source	Is there a map raw water watershed or well field available?	ICMA
	Water source	What is the quality of the raw water source? e. pure f. slight contamination g. heavy contamination h. don't know	ICMA
	Water source	Are there specific contaminants such as: i. bacteria j. sediment k. color l. odor m. bad taste n. hardness o. industrial waste p. other	ICMA
	Water source	If the raw water source is a river or reservoir, are there any upstream discharges? d. municipal e. industrial f. other	ICMA
	Water source	If the raw water source is a wells, are they protected from surface contamination?	ICMA

## H-16

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Water source	What is the rated capacity of the raw water source?	
	Water source	Is the raw water source yield equal, less than or greater than the normal and peak water demand?	ICMA
	Water source	If the raw water source is not immediately adjacent to the treatment and distribution facility, how is it conveyed? e. pipeline f. open channel or canal g. gravity h. pumped	ICMA
	Quality of water	What is the quality of water for the end user? d. Taste e. Color f. Bacteria	CDM
	Quality of water	Does the quality of finished water meet all standards and requirements?	ICMA
	Demand for water	Has the vodokanal forecast demand for water? If yes, get a copy of the forecast and support for conclusions.	RTI
	Interruptions in service	What is the extent of interruptions in service?	CDM
	Pressure	What is the range of pressure throughout the day?	CDM
	Storage	What is the amount of storage as a percentage of average daily water use?	CDM
	Peak hour	What is the ratio of peak hour to average flow?	CDM
	Bacteria	What bacterias are present in the water for the end user?	ICMA
	Consumption	What is the per capita consumption of water	CDM
	Percentage of population served	What is the percentage of population served by the vodokanal?	CDM
	Laboratory	Do you have a laboratory for testing water? If not how do you test it? How often do you test it?	ICMA
	Preventive maintenance	Is there a preventive maintenance program in place how much of it are you carrying out now?	PADCO/RTI
	Metering	Is the water production metered? If not, how is production arrived?	PADCO

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Monitoring	What is the percentage of accounted for water?	CDM
	Monitoring	Have there been other studies or assessments of the vodokanal in the last five years? Identify them and get copies	CDM
	Monitoring	Is water consumption metered? d. Residential e. budget organizations/municipal f. enterprise g. industrial	RTI/PADCO
	Monitoring	Has the vodokanal reviewed its system for efficiency improvements?	PADCO
	Monitoring	Has the vodokanal reviewed its system for efficiency improvements?	PADCO
	Monitoring	Has the vodokanal reviewed the amount of water loss and does this match the amount of projected loss in the tariff calculation?	PADCO
	Monitoring	What is the percentage of water loss?	ICMA/PADCO
	Monitoring	What is the national norm for water loss?	ICMA/PADCO
	Water treatment process	What is your water treatment process?	RTI/PADCO
	Water treatment	Does the water treatment meet national standards?	RTI
	Water treatment	Are the treatment processes utilized adequate to compensate for all known deficiencies in raw water quality?	ICMA
	Water treatment	Is the rated capacity of the treatment facility equal, less than or greater than the peak system demand?	ICMA
	Water treatment	Please name, describe and locate the treatment processes employed in the water purification process.	ICMA
	Water treatment	If possible, please provide a flow plan and location plan for all processes used. Please show all process facility and equipment locations. Are the treatment units adequately sized so that all flows pass through all treatment processes at all times? Please indicate processes bypassed under high flow conditions.	ICMA

Category	Data Element	Question	Source
	Water treatment	Disinfection of water (chemicals and processes used, location or locations of processes)	ICMA
		Solids removal e. flocculation f. sedimentation g. filtration h. other	ICMA
	Water treatment /Solids disposal	How are removed solids and sludges treated and disposed of?	ICMA
	Water treatment /Softening	What processes are used for water softening?	ICMA
	Water treatment	How are bad colors removed?	ICMA
	Water treatment	How is taste and odor controlled?	ICMA
	Finished water quality	Have there been customer complaints regarding: e. color f. odor g. taste h. hardness	
	Distribution problems	Are there problems in the distribution of water? e. pumping capacity f. line capacity g. lack of pressure in the residential buildings? h. Other	PADCO
	Water distribution system	How and where is finished water stored?	ICMA
	Water distribution system	What is the size of the distribution system(kilometers of pipe)?	ICMA
	Water distribution system	If possible please provide a map of the distribution system. Please indicate pipe diameters and lengths, materials of pipe construction, methods of joint construction, and age of lines	ICMA
	Pumping and storage facilities	Are pumps used to convey water through the distribution system? If so, what are there: c. sizes d. types e. ages	ICMA

H-19

<b>Category</b>	<b>Data Element</b>	<b>Question</b>	<b>Source</b>
	Distribution system analysis	Are there elevated or ground storage tanks located within the distribution system?	ICMA
	Distribution system analysis	What is the greatest elevation difference between customer locations within the distribution system?	ICMA
	Distribution system analysis	Is there more than one pressure zone? If so, please provide a map showing pressure zones.	ICMA
	Distribution system analysis	Have lost water surveys been conducted within the distribution system?	ICMA
	Distribution system analysis	Are estimates of water losses based on the national norms, estimates or actual flow measurements?	ICMA
	Distribution system analysis	Have hydraulic analysis (Hardy Cross etc.) been performed on the water distribution system?	ICMA
	Flow measurement and recording	Please indicate the locations of all flow meters from the raw intake throughout the treatment facility and distribution system	ICMA
	Flow measurement and recording	What type of flow meters are used? e. venturi f. propeller g. magnetic h. ultrasonic	ICMA
	Flow measurement and recording	Are flow records available?	ICMA
	Flow measurement and recording	Are customers water meters regularly tested and calibrated? If so, are such tests scheduled in advance?	ICMA
	System age	What are the ages of major treatment and distribution facilities?	ICMA
	System problems	Are there any treatment or distribution system problems which we should be aware of?	ICMA

**ATTACHMENT I**  
**ATYRAU FIELD TEST REPORT**

**RAPID ASSESSMENT REPORT**  
**ON THE ATYRAU**  
**VODOKANAL**

**FEBRUARY 7, 2000**

**CONTRACT # 1-00-99-00013-00**

**TASK ORDER #4**

**INTERNATIONAL CITY/COUNTY MANAGEMENT ASSOCIATION**

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# **RAPID ASSESSMENT OF THE ATYRAU VODOKANAL**

## **1. Introduction**

USAID contracted with ICMA to conduct a rapid assessment of the Atyrau vodokanal as part of a task order to develop and test a rapid assessment methodology. The field test site of Atyrau, Kazakhstan was selected by USAID for the methodology test. A two-person team conducted the test. The two members were Michael Shea and Frank Schutz. Mr. Shea conducted the financial and institutional analysis and Mr. Schutz conducted the engineering analysis. The assessment was conducted over a one-week period beginning on February 1, 2000. The assessment is only assessing drinking water and is not assessing wastewater and sewage.

## **2. Institutional Findings**

The ICMA team interviewed Mr. Saduakasov, Mr. Revadii, and Mr. Samiev at the vodokanal, Mr. Biamukhanov, Deputy Akim of the City of Atyrau, Mr. Zhumagulov, Deputy Akim of the Oblast, and Mr. Nurgalievich, former head of the former World Bank PIU. In addition documents such as national laws and the vodokanal charter were collected and reviewed.

### **2.1 Legal structure**

The vodokanal operates under the Law of the Republik of Kazakhstan “On Natural Monopolies” (attached). Vodokanals are created by the national government as a state enterprise and report to the city Akim on a quarterly basis (see the attached charter and city organization chart). The vodokanal actually reports to two deputy Akims in the city, one for financial and one for engineering. Tariff procedures and approvals are based on decree of the Kazakhstan Republic Committee on Regulation of Natural Monopolies on August 14, 1998 No. 2/5 and August 6, 1999 No. 59-01 (see attached).

### **2.2 Operational Context and Organizational Description**

#### **Operating Environment**

Atyrau has a local economy that is focused on supporting the production of oil from the nearby Caspian Sea. The City is divided by the Ural River, which separates it into Europe and Asia. Atyrau has a population of 439,900 with 89 percent Kazakh and 8.7 percent Russian. In October 1999, the average per capita monthly income was 5413 Tenge or \$38.80 U.S. Atyrau is very flat and was formerly part of the Caspian Sea. As a result, the soil has a high salt content and there is a high water table only 20 centimeters below the surface, and the water is very saline with a high corrosive quality that causes severe problems for the steel pipes in the current water delivery system.

The Atyrau vodokanal has an unusual operating situation with Kaztransoil managing the water treatment, pumping, and some water delivery. Kaztransoil is a large national organization that

manages the transportation of oil and gas in Kazakhstan. The treated water from Kaztransoil is then provided to the vodokanal at pressure for distribution to the consumers (see attached organization chart).

The Atyrau vodokanal has qualified for a \$16.5 million dollar World Bank loan. The loan is expected to become effective in February 2000 after the City and Oblast have met the effectiveness conditions in the loan. Within the \$16.5 million, \$2.5 million can be used for technical assistance and \$14 million can be used for capital repairs. The oblast and City have determined that the primary capital expense need is replacing the pipes in the drinking water delivery system.

### **Staff Size, Capacity and Skills**

The City Akim appoints the Director of the vodokanal. The vodokanal staff currently has 470 staff and has added 100 staff in the past year. The vodokanal is organized along typical lines with four deputies and 15 departments under these deputies (see attached organization chart). There are 30 supervisory staff and managers and 41 staff work exclusively on drinking water activities. The staff has increased 32 percent over the last five years. The vodokanal is currently three months in arrears on staff salary payments and they are gradually trying to reduce the arrears.

The staff appears skilled for the current operating system, but could use training in implementing a more up to date operating system. Staff skills are very much in the old style Soviet system. All financial accounting and billings are done by hand. Staff skills definitely need to be upgraded in conjunction with computerization of the billing and accounting departments.

## **2.3 Management and Operations**

### **Operations**

The main services of the vodokanal include the supply of drinking water and wastewater collection and treatment. In supporting the main services, the vodokanal performs construction and repair of pipes, sales and installation of meters, and renting out special trucks. The vodokanal plans to expand the services of its existing laboratory facility and begin the testing and calibration of meters.

The vodokanal charges connection fees when a customer submits an application for connection. Businesses are connected to central water and sewerage on an obligatory basis while residential units are connected if they apply. The vodokanal will connect customers to the mail water lines if they wish with the vodokanal picking up the connection cost.

The vodokanal customer profile is listed in the table below.

**Table 1 Customer Profile**

<b>Type of Customer</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Residential	32681	40565	43018
Industrial	133	154	160
Other communities	303	371	501

The number of residential customers has increased by 24 percent over the last three years, while the number of customers in other communities has also increased. The major industrial customers include the power stations, a dairy, a brewery, bakeries, and propane distributor. These industrial companies represent 45 percent of the vodokanal's potential revenues.

The vodokanal appears to be well organized according to the organization chart. The vodokanal uses job descriptions for positions and fills the position according to the skills required in the job descriptions (samples attached). The Director of the vodokanal is appointed by the City Akim and reports to the Board of the City Akimat once a quarter.

There is no service agreement in place between the City and the vodokanal.

The Finance Department is well trained and keeps good records, although all financial activities are performed by hand. The finance staff understood the concepts in this study's assessment table shells and was able to fill them out with some guidance and definitions.

The lack of computerization is a serious problem for the vodokanal. They need computers and trained staff to implement and maintain more efficient operations particularly in the finance and billing departments.

The vodokanal follows the procurement regulations "Regulations on Material and Financial Resources Procurement" No. 216 dated 14.08.98. The vodokanal seems to have a good control system for supplies and inventory

### **Operations and Maintenance**

The primary operation and maintenance responsibility of the vodokanal is the maintenance of its water distribution network. Because the vodokanal neither collects, treats nor pumps the water which it provides for its customers, it has no operational or maintenance responsibilities in these areas.

The maintenance of distribution network has become a major responsibility of the vodokanal because of the conditions under which the distribution system must operate. These conditions have been described as follows:

"At the depth of 15-20 cm (the typical depth of water line placement) there are underground water basins having very aggressive composition which effects the infrastructure net, foundations of buildings and facilities, plants. These factors influence on the increase of

expenditures of construction of different facilities. The salinity of underground water and soil corrode the water and sewage pipelines and they are obsolete and are in emergency state. This problem is described in the Long - term Strategy of the City Development worked out by USAID and it is supported by the Government."

It has also been reported that the average useful life of pipe placed in the ground is approximately four years. However, the average age of existing pipe in the ground has been reported as being 15 years. It has also been reported that 40% of the water distribution system required immediate repair. Under these conditions, an active maintenance program would be required to initially repair or replace 40% of the existing pipe network and then continue to rehabilitate up to 25% of the distribution network each year. This continuing level of effort is beyond the current resources of the vodokanal. However a pilot "demonstration" maintenance, repair and replacement program is being initiated in the Privokzalny District of the city with the support of the World Bank.

Water line maintenance is currently provided in accordance with a long term and annual plan. The vodokanal identifies the most important lines to be repaired on the basis of danger to the population and the length of time which has elapsed since the leak was initially reported.

Water line breaks are also repaired on an emergency basis. In 1999, 795 water line breaks were reported. 343 were repaired within one day of their being reported. Most other remaining breaks were repaired within 10 days of their being reported. The vodokanal maintains an operating staff of 470 persons performing operation and maintenance as well as other assigned duties.

### **Tariff Approval Process**

The two decrees on tariffs mentioned in section 2.3 and attached establish the cost items that can be included in a justification for a tariff increase. They also include the procedure for obtaining tariff increases. The tariff request has to be submitted to the Authorized Body, which is the Akimat for the vodokanal. The City can conduct public hearings, although they did not do this for the last increase. The vodokanal has to notify customers of the rate increase not later than 10 days before they are implemented. If the vodokanal fails to notify customers, they cannot implement the increase until they are notified. The tariff increase is effective the first day of the next quarter.

One problem with the definition of costs that can be included in the tariff is the omission of the cost of servicing loan paybacks. Loan servicing is not an allowable cost which is a serious problem for vodokanals paying back large loans.

### **3 Financial Findings**

#### **3.1 The Current Tariff for Drinking Water**

The current tariff is 13.84 Tenge per c/m of drinking water which implemented in July 1998. The previous tariff was 11.4 Tenge per c/m. The vodokanal purchases their water from Kaztransoil. Kaztransoil was charging them 5.2 Tenge per c/m for water in 1998 and has since reduced the charge to .2 Tenge per c/m which appears to be subsidy.

The current tariff has not been changed in a year and a half and the vodokanal would like another increase since their operating costs went up significantly in the past year. The cost of paying back a loan can not be charged as an operating expense in calculating a new tariff under the current decree.

Tariff charges are the same for all classes of users in Atyrau. In many NIS vodokanal systems, there is a cross subsidy where enterprises are charged at a high rate to subsidize residential users which is counter productive as the enterprises become bankrupt.

#### **3.2 Financial Overview**

The vodokanal operated at a small profit in 1998 and at a small loss in 1999. The loss was attributable to higher personal and maintenance costs with the addition of 100 new staff in 1999, and the incorporation of a number of water and wastewater systems from enterprises. The large difference between the cost of treated and pumped water from Kaztransoil and the tariff rate of 13.64 Tenge per c/m for delivered water from the vodokanal should provide an operating profit if the vodokanal can reduce their operating costs. They may also try to increase the tariff since it has been a year and half since the last increase.

The vodokanal also has some substantial debts with a debt of 48,787,254 Tenge (\$349,724 US) to Kaztransoil and three months staff salary arrears. The Kaztransoil debt largely occurred when the vodokanal went to court to contest the amount of delivered water that Kaztransoil said they provided. The vodokanal lost and the case took one and half years before it was arbitrated in favor of Kaztransoil. The vodokanal withheld payment during this period. It will take the vodokanal several years to pay back the arrears.

In reviewing the financial data provided by the vodokanal, we found some small discrepancies and given more than the one-week of the methodology test we could have probably fully reconciled the data. However, we do not think that the discrepancies changed any of the financial conclusions in this report.

**TABLE 2 VODOKANAL PROFIT AND LOSS FOR THE PAST TWO YEARS**

<b>Item</b>	<b>1998 Tenge</b>	<b>US \$</b>	<b>1999 Tenge</b>	<b>US \$</b>	<b>%Change</b>
Water and Sewer Revenue	212,600,000	1,524,014	156,000,000	1,118,280	-27
Other Revenue	13,800,000	98,925	55,500,000	397,849	302
Total Revenues	226,400,000	1,622,939	211,500,000	1,516,129	-7
Total Expenditures (excluding taxes and depreciation)	187,200,000	1,341,935	153,700,000	1,101,792	-18
Net Income Before Taxes and Depreciation	39,200,000	281,004	57,800,000	414,337	48
Depreciation Expense	18,700,000	134,051	31,200,000	223,656	48
Taxes and VAT	15,200,000	108,961	31,100,000	222,939	51
Net Income/ (loss)	5,300,000	37,993	-4,500,000	-32,258	185

The conversion rate of Tenge to US dollars is \$ 1 = 139.5 Tenge

### **3.3 Financial Management Policies and Systems**

The accounting department has several staff and reports to the Deputy Director of the vodokanal, Mr. Gafur Samiev. Mr. Samiev also supervises the billings to customers and a finance and economics department. All calculations are performed by hand and there are no computers in the department, although they do plan to introduce them in the near future. The accounting department maintains good files and documentation of expenses, invoices and payments. The accounting department prepares quarterly financial reports for the report to the city Akimat.

The vodokanal tracks its inventory and values it according to market prices for inventory items. The inventory declined substantially between 1998 and 1999 from 83,200,000 Tenge to 26,100,000 Tenge because much of it was used for reconstruction of water and wastewater systems taken over from enterprises during the year.

The vodokanal uses depreciation rates set by the Government of Kazakhstan in the Tax Code. In April of 1999, the depreciation rates were changed and depreciation rates can now be accelerated which is reflected in the expense statement of the vodokanal.

The vodokanal has a system to track all of its assets and to value them. Assets increased last year with the addition of pipe systems from the enterprises and capital contributions by the city and oblast. As Table 3 shows, the vodokanal assets increased by 36 percent in the past year due to the incorporation of water and sewer systems from enterprises and the capital expense contributions on the part of the city and oblast.

The vodokanal pays a 30 percent income tax and 26 percent social tax for its' employees. They also pay 20 percent VAT on all purchases. The vodokanal pays a tax on profit, a land tax, a property tax, a transportation tax and an environmental protection fund tax. They have not been subject to any penalties from the government.

**TABLE 3 VODOKANAL ASSET SHEET**

<b>Current Assets</b>	<b>Year 1998</b>	<b>Year 1999</b>	<b>% Change</b>
Cash and equivalents	800,000	900,000	12.5
Accounts Receivable	261,600,000	297,000,000	13.53
Provision for Doubtful Accounts			
Intangible Assets			
Inventory	83,200,000	26,100,000	-68.63
<b>TOTAL CURRENT ASSETS</b>	<b>345,600,000</b>	<b>324,000,000</b>	<b>-6.25</b>
<b>FIXED ASSETS</b>	<b>147,400,000</b>	<b>200,000,000</b>	<b>35.69</b>
Property, Plant and Equipment			
Uninstalled Equip.			
Work in Progress			
<b>Total Fixed Assets</b>	<b>147,400,000</b>	<b>200,000,000</b>	<b>35.69</b>

### **3.4 Financial Systems and Controls**

Billings for all customers are prepared by hand and go to customers on a monthly basis. Customer payments are due on receipt. The collection rates have been good for a vodokanal, but in the past two months they have been extraordinary. The national government had a much better than expected national tax collection rate this past year and paid off may arrears to pensioners and salaries and to local and oblast governments. As a result, the vodokanal customer groups paid their bills and also paid some arrears.

The payments from budget organizations in the past year were 236 percent of the billed amount for water in Table 4. The overall collection rate was 81 percent for 1999. All of the cash collections and offsets (subsidies) are from the general population. Budget organizations pay in barter and by providing services such as electricity from the electric company. The numbers in

Table 4 and Table 6 are different because Table 4 uses billings and revenue from both drinking water and sewer activity while Table 6 uses only drinking water figures.

**TABLE 4 VODOKANAL COLLECTION ANALYSIS—BY CUSTOMER CATEGORY**

<b>Activity</b>	<b>Total for Year</b>	<b>General Population</b>	<b>Budget Organization</b>	<b>Enterprises</b>
Billed Water & Sewer	186,744,000	149,261,000	15,890,000	21,593,000
Collected Billings-Cash	65,860,000	65,860,000		
Offsets	11,142,000	11,142,000		
Barter	35,133,000	16,200,000	822,000	18,111,000
Other –services	39,749,000	1,142,000	36,660,000	1,947,000
Total Collected	151,884,000	94,344,000	37,482,000	20,058,000
% Collected of Billed	81.3%	63.21%	235.88%	92.89%

In the past, the overall collection rate was about 70 percent. Table 5 shows the normal collection rate compared to the rate in 1999. The vodokanal said that in January of 2000, the collection rates seemed to be reverting to the old rates.

**Table 5 Improved Collection Rate in 1999**

<b>Customer Type</b>	<b>1998</b>	<b>1999</b>
General Population	50%	63%
Budget Organizations	90%	236%
Enterprises	80%	93.5%

The vodokanal collected 39 percent of its revenue in cash in 1999 as shown in Table 6. This is a high percentage for vodokanals in the NIS, however this figure must be improved on in the future if they are going to operate in a market economy. Barter accounts for 21 percent of the revenue and other-services accounts for 23 percent. The barter and services revenue need to be reduced if the vodokanal is moving to a market economy standing.

**Table 6 Vodokanal Collection Analysis—By Year**

<b>5.2 Activity</b>	<b>Year 1998</b>	<b>Year 1999</b>	<b>1999 % of Total</b>
<b>5.2.1 Billed for Drinking Water</b>	106,860,000	101,932,000	
Collected Billings—Cash	39,200,000	39,516,000	39
Offsets	37,000	6,000	6
Barter	0	21,165,000	21
Other	0	23,850,000	23
Uncollected	67,623,000	11,401,000	11

The billing includes VAT and collections include VAT

The inventory control system appears to be a good system for control of inventory but may be overly cumbersome. The heads of workshops fill in a request form and submit it to the accountant responsible for the inventories. The request form is then signed by the chief accountant and registered on the books of the logistics department. The request form is then signed by the head of logistics and sent to vodokanal Director. All departments fill in a request form for items they will need at the beginning of the year. The logistics department finds suppliers, obtains prices and purchases the items. The purchased items are stored in a warehouse and dispersed according to the above procedure.

The vodokanal prepares an annual budget that is approved by the Director and the Akimat. The budget preparation process involves the key staff in the vodokanal in soliciting expense estimates for the next year.

### **3.5 Vodokanal Profit and Loss**

As Table 2 shows, the vodokanal has a small profit in 1998 and a small loss in 1999. They had a substantial decrease in revenue (27%) from water and sewer billings in 1999, but had an increase in other revenue such as selling and installing meters in 1999. The expenses were less in 1999, so they had a higher net income before taxes and depreciation in 1999. However, the depreciation and taxes were higher in 1999 with the new depreciation rates and they showed a small loss for the year. The profit difference between the two years is small at \$70,000 US.

In reviewing the expenses in Table 7, the personnel costs increased by 21 percent with the hiring of 100 new staff, but the production expenses decreased by 54 percent with the dramatic reduction in the price of water from Kaztransoil. Depreciation expenses increased by 40 percent between the two years, but the overall expenses decreased by 12 percent.

**TABLE 7. VODOKANAL EXPENSE COMPARISON - 2 YEARS**

<b>Expense Category</b>	<b>Year 1998</b>	<b>% of Total</b>	<b>Year 1999</b>	<b>% of Total</b>	<b>Percent Increase 1998 to 1999</b>
<b>Personnel Costs</b>					
<b>Wages</b>	39,500,000	15.63	61,900,000	26.92	
Pension Fund	3,900,000	1.54	6,100,000	2.65	
Medical Insurance					
Social Fund	11,700,000	4.63	1,600,000	.70	
Unemployment Ins.					
Bonuses					
<b>TOTAL PERSONNEL COSTS</b>	<b>55,100,000</b>	<b>21.80</b>	<b>69,600,000</b>	<b>30.27</b>	<b>21</b>
<b>Production Expenses</b>					
Energy	10,700,000	4.63	17,000,000	7.39	
Materials and Chemicals	23,600,000	9.34	24,200,000	10.53	
Minor Repairs					
Maintenance					
Work Shop					
Miscellaneous Prod. Exp.	118,500,000	46.88	43,200,000	18.79	
Taxes (excluding profit and VAT)	4,200,000	1.68	17,500,000	7.61	
Short-term loans					
<b>Total Production Exp.</b>	<b>157,000,000</b>	<b>62.10</b>	<b>101,900,000</b>	<b>44.32</b>	<b>-54</b>
<b>Non-Production Expenses</b>					
Profit Taxes	1,400,000	.55	0		
VAT*	9,600,000	3.80	13,600,000	5.92	
Fines, other Penalties			0		
<b>Total Non-Production Expenses</b>	<b>11,000,000</b>	<b>4.35</b>	<b>13,600,000</b>	<b>5.92</b>	<b>19</b>
Depreciation Expense	18,700,000	7.40	31,200,000	13.57	40
<b>Total Expenses</b>	<b>241,800,000</b>		<b>216,300,000</b>		<b>-12</b>

\*VAT is not always collected from the customer but must be paid to the central government by the utility, thus it becomes an expense.

The balance sheet shows a substantial increase in fixed assets and property over the past year with a decrease in inventory. Accounts payable decreased slightly, but the salaries and social taxes owed to employees have increased in the past year.

**TABLE 8 BALANCE SHEET CORRELATION TO RUSSIAN ACCOUNT NUMBERS**

<b>Russian Account Code</b>	<b>Balance Sheet Item</b>	<b>Notes</b>	<b>December 31, 1998 (in 000 Tenge)</b>	<b>December 31, 1999 (in 000 Tenge)</b>
01	Property, Plant and Equipment Fixed Assets		508,400,000	579,000,000
02	Less Depreciation		361,000,000	379,000,000
	Net Fixed Assets		147,400,000	200,000,000
04, 06	Intangible Assets and Investments Current Assets			
10, 12	Inventory		83,200,000	26,100,000
19	VAT on Materials			
62,48,71,73,76	Accounts Receivable		261,700,000	297,000,000
50,51,53,55	Bank and cash balances		800,000	900,000
	Total Assets		493,100,000	524,000,000
	<b>Current Liabilities</b>			
60,48,73,76	Accounts Payable		287,700,000	274,200,000
90	Short-term loans			
70	Salaries Payable		4,600,000	12,000,000
69,65,67,68	Social Taxes Payable		4,500,000	47,000,000
68.3	VAT Payable on Accrued Income Long Term Liabilities			
	Total Liabilities		296,800,000	333,500,000
	<b>Equity Capital</b>			
85	Founding Capital		195,000,000	195,000,000
	Revaluation Surpluses		1,300,000	-4,500,000
87.1	Development Funds			
87.2	Social Funds			
88	Capital Reserves			
	Total Liabilities		493,100,000	524,000,000

The vodokanal has a substantial amount of bad debts from the general population customer group as shown in Table 9. While the percentage of accounts receivable declined in the past year, it is clear that most of this outstanding amount will not be recovered. Over 90 percent of the accounts receivable are from the general population group. Collection efforts will need to be focused on this group. The vodokanal has the authority to cut off service although the service cutoff will affect the entire building. The vodokanal can also take the non-payers to court and take their apartment to satisfy the debt. The vodokanal should write off the bad debts in order to produce a more balanced and accurate financial picture.

**Table 9 Accounts Receivable—Aging**

<b>Type Organization</b>	<b>Prior Period A/R 1998</b>	<b>Current Period A/R 1999</b>	<b>Amount in US Dollars For 1999</b>	<b>Percent of Total A/R</b>
<b>5.2.2 Population</b>	158,995,000	177,404,000	1,271,713	90.03%
Budget Orgs.	7,320,000	1,330,000	9,534	.67%
Enterprises	77,913,000	5,869,000	42,072	2.98%
Other	2,362,000	5,500,000	39,427	2.79%
<b>Total</b>	<b>208,951,000</b>	<b>197,059,000</b>	<b>1,412,609</b>	

### **3.6 Capital Expenses and How They Pay for Them**

The vodokanal receives capital expense contributions from the city and the oblast. In 1999, the city Akimat provided 33.5 million Tenge for repairs of water and sewer lines. The oblast contributed 21.9 million Tenge for similar expenses.

The vodokanal has received a World Bank loan for \$14 million in capital repairs if it can meet the conditions and draw on the funds. The World Bank loan will be used for capital expenses in the repairs of water and sewer lines in the distribution system.

## 4 Engineering Findings

The Atyrau Vodokanal is an untypical vodokanal as it neither collects, treats or pumps the water which it provides to its customers. Instead it purchases finished water from Kaztransoil (a petroleum utility) which then pumps the purchased water directly into the Atyrau Vodokanal's distribution lines.

The Atyrau Vodokanal purchases approximately 54,000 and 56,000 cubic meters (m<sup>3</sup>) of treated water from Kaztransoil each day at a cost of 0.2 Tenge per m<sup>3</sup>. The Vodokanal then resells and delivers this treated water to its customers at a price of 13.84 Tenge per m<sup>3</sup>.

Kaztransoil, the source of the Atyrau Vodokanal's treated water supply, is a major wholesale provider of municipal drinking water, serving several other Caspian area vodokanal's in addition to Atyrau. Kaztransoil, however, while being a supplier of potable water, is primarily an oil producing organization and utilizes much of the water which it produces at other locations to support its drilling operations. Potable water for resale may be only a minor portion of its water production operations. Sufficient water is provided by Kaztransoil to allow the Atyrau Vodokanal to supply water to its customers on a continuous 24-hour per day basis.

Calculating water losses on the basis of currently used norms, the Atyrau Vodokanal estimates that it loses approximately 50% of the water that it purchases from Kaztransoil. However, on the basis of actual calculations, the Vodokanal suspects that it may be losing as much as 60% of the water that it purchases from Kaztransoil.

The reported impact of this high rate of water loss on vodokanal operations is hydraulic overloading of its water distribution system to keep up with the excessive water demand created by the leakage. According to the vodokanal, this hydraulic overloading causes a significant loss of pressure to occur in many portions of the distribution system. In many residential sections of the city, the vodokanal is unable to provide water service to residents living above the first floor level. One individual purchaser of vodokanal water indicated that satisfactory water pressure was available at his home only during off hours such as 3 AM in the morning but was insufficient during later hours when there was a greater demand for water. This purchaser also indicated that the diameter of the water line leading to his home was 100 mm which should have provided adequate pressure under normal conditions of heavy demand.

To remedy this situation, the Atyrau Vodokanal has obtained a loan from the World Bank to finance a line repair and replacement "demonstration" project in the Privokalny District of Atyrau. This project will be implemented in an area of high rise apartments with high levels of pipe leakage and water loss. The goals of this demonstration project and continuing pipe repair and rehabilitation programs are to; 1) reduce excessive flows throughout the distribution system caused by leakage so as to provide adequate pressure to all vodokanal customers especially those located on the upper floors of communal apartment buildings, and; 2) to reduce the leakage occurring within individual apartment buildings. Water leakage within apartment buildings is reported to be the cause basement flooding and the creation of unhealthful and unsanitary conditions.

Distribution system line repairs are currently scheduled and performed on the basis of danger to their surroundings and the length of time since problems and leakage were initially reported. During the year 1999, 795 water line breaks were reported. Of these line breaks, 343 were reported as having been repaired within one day of their occurrence.

The Atyrau Vodokanal has provided information regarding the existence of a hydraulic analysis of its water distribution system that was completed by a local consultant. This report has not been released because of a dispute over the payment of fees to the consultant who performed the work. This report may contain useful information regarding flow rates, leakage and line pressures within the vodokanal water distribution system and could be potentially useful in regard to the provision of additional technical assistance to the vodokanal. It may also be of value during the initiation of a water loss and pipe repair and replacement program.

The reported average age of pipe in the distribution system is approximately 15 years. The pipes are made of steel with welded joints between adjacent sections. Much of the leakage has reportedly been the result of corrosion occurring within the body of the steel pipe rather than at the welded joints. The reported useful life of steel pipe buried in the soils of the Atyrau area is 4 years. There has been no independent verification of this data. The proposed replacement pipes will be either ductile iron or PVC plastic.

According to information provided by the Director of the Atyrau Sanitary and Epidemiology Department, 99.8% of the water quality samples obtained from the vodokanal water distribution lines met applicable bacteriological standards. Of the samples tested 96.2% met applicable coliform bacterial standards. 98.5% of the water samples tested passes applicable chemical indicators.

The reported loss of service pressure at the end of a 100 mm diameter water line suggests possibility that pressure loss may also be caused by a reduction in line capacity caused by the internal buildup of mineral or organic scale.

#### Specific Engineering Findings and Observations:

##### *Water Quality*

The quality of finished water in the Atyrau Vodokanal is required to meet the following standards:

##### Bacteriological:

- 1 - Coliform-index (the number of intestinal bacillus bacteria in 1 liter of water) should not exceed 3.
- 2 - Number microorganisms in 1 liter of water should not exceed 100.

##### Observable Contaminants:

- 1 - Color - should not exceed 20 degrees C

- 2 -Cloudiness (turbidity) should not exceed 1.5 m gr/dm<sup>3</sup>
- 3 -Smell under conditions of 20 - 60 degrees C - should not exceed 2 points
- 4 -Taste under conditions of 20 degrees C no more than two units

#### Chemical

- 1 -Chlorides - should not exceed 350 mgr/dm<sup>3</sup>
- 2 -Nitrides - should not exceed 10 mgr/dm<sup>3</sup>
- 3 -Nitrates - should not exceed 45 mgr/dm<sup>3</sup>
- 4 -Ammonia - should not exceed 2 mgr/dm<sup>3</sup>
- 5 -Residual chloride - 2 mgr/dm<sup>3</sup>

According to the Director of the Oblast Sanitary and Epidemiology Department, "the general situation of the Oblast water is 'normal', there are no water borne diseases, only cases of children's stomach problems."

"Of the water in the distribution lines, 0.2% doesn't pass bacteriological standards, 3.8% does not pass coliform standards and 1.5% doesn't pass chemical indicators."

#### Laboratory Facilities and Use for Testing:

Both the Oblast and Vodokanal maintain laboratory facilities for water testing.

#### Pumping Capacity:

The vodokanal operates and maintains no pumping capacity with the exception of a small booster pump located at one housing site. Treated water is provided at working pressure by Kaztransoil.

#### Water Loss Norms and Estimates:

According to data provided by the Atyrau Vodokanal, actual water losses in 1999 ranged from a low of 61.2% in September to a high of 67.2% in July. Water loss is calculated by subtracting the amount of water sold to the population, budgetary (social service) organizations and industrial customers from the amount of water purchased from Kaztransoil. However, not all of the population receives metered service and a large portion of the population's water use is based upon norms of consumption. The norm for water loss for a vodokanal the size of Atyrau's is 50%.

### Water Treatment Procedures and Results:

As previously stated, the Atyrau Vodokanal does not provide treatment to the water which it distributes. It purchases treated water from Kaztransoil.

While access was not provided to the Kaztransoil facilities, it was learned that Kaztransoil maintains four treatment units consisting of coagulation and sedimentation, followed by filtration and disinfection. The initial process train with a rated capacity of 10,000 m<sup>3</sup> (cubic meters) per day was installed in 1936. An additional unit of 10,000 m<sup>3</sup> per day capacity was added in 1968 followed by an additional 10,000 m<sup>3</sup> per day of capacity in 1987 and a final addition of 30,000 m<sup>3</sup> per day capacity installed in 1994.

The 60,000 m<sup>3</sup> of installed treatment capacity exceeds the vodokanal's average daily purchase of between 54,000 and 56,000 m<sup>3</sup> of treated water.

The results of the water treatment process are described in Section I, Water Quality

### *Water Sources*

The water source for Kaztransoil and the water provided to the Atyrau vodokanal is the Ural River.

### Water Service Operating Hours:

According to the Atyrau Vodokanal, water service is provided on a 24 hour per day, seven-day per week basis.

### Maintenance Systems:

The only maintenance responsibility of the vodokanal which neither treats nor pumps the water which it sells, is the maintenance of the distribution system. Water line maintenance is provided in accordance with a long term plan and annual plans. The vodokanal identifies the most important lines to be repaired on the basis of danger to the population and the length of time which has elapsed since the leak was initially reported.

Water line breaks are also repaired on an emergency basis. In 1999, 795 water line breaks were reported. 343 were repaired within one day of their being reported. Most other remaining breaks were repaired within 10 days of their being reported.

### *Extent of Metering*

Of 745 residential structures, 174 had one individual meter per building. In addition to these meters, 3,200 residents of multifamily apartment structures have purchased and installed their own individual water meters. This was done on a voluntarily basis where the anticipated cost of paying for water on a metered basis was less than the cost of purchasing water on the basis of norms.

## **5 Recommendations**

### **5.1 Institutional**

The World Bank will push for an independent status for the vodokanal probably in the form of a joint stock company. This change will require a change in national legislation to authorize the change from a natural monopoly to a joint stock company. The World Bank wants the vodokanal to be separate to operate in a market economy and to become financially self-sufficient.

The vodokanal appears to be over staffed. They have 470 employees and do not treat or pump the drinking water. They hired 100 new staff in the past year. They can reduce the operating costs and reduce the need for a tariff increase with a staff reduction. The vodokanal should conduct an analysis of job functions and staffing levels for functions to determine what positions can be eliminated.

The vodokanal currently reports to two Deputy Akims in the City government. It would simplify the vodokanals reporting if they could report to one Deputy Akim.

The inventory system controls seem overly complex. Staff time could be saved and speed of acquisition of items could be achieved if the inventory system could be simplified.

### **5.2 Financial**

The billing system needs to be automated and needs to focus on obtaining higher collection rates from the general population. The vodokanal also needs to try to convert more payments from budget organizations and enterprises into cash payments. Barter payments are difficult for the vodokanal to convert into cash.

The payroll, accounting and budgeting systems need to be computerized. Computers need to be purchased and staff need to be trained on using the software and accounting system. We understand that the Carana Corporation is conducting accounting system training, but this should be tied into the computerization process.

### **5.3 Engineering**

The primary engineering technical assistance need of the Atyrau Vodokanal is for independent technical assistance in the development, evaluation and implementation of the plan under which the pressure provided to vodokanal customers is to be increased.

The proposed method selected to achieve this result will be through a reduction in leakage and water losses. The high volumes of flow required to sustain adequate service throughout the system and to compensate for water losses has been identified as the cause of the pressure problem. Thus the reduction of pressure losses caused by these higher flows is anticipated to be

sufficient to provide adequate pressure to all vodokanal customers. While no data was presented to support this conclusion, the vodokanal anticipates that when deteriorated piping is replaced and water losses reduced, that service pressure will increase sufficiently to serve all Atyrau residents

Under present Kaztransoil water pricing policies there appears be little economic incentive for the vodokanal to eliminate leakage and water losses from the Atyrau water distribution system. However, should the pricing policies of Kaztransoil be modified upward in the future, the incentive to reduce system leakage would return.

Data concerning the locations of leaks and significant pressure losses contained in the unreleased water distribution system analysis may be of value in planning and monitoring the rehabilitation of the system.

The current water line repair and replacement program, with the exception of the demonstration project, appears to be unfocused, reactive and subject to influence from those requesting repairs the most loudly.

Although it may not yield immediate financial benefits to the vodokanal, a pipe repair and replacement program to produce a reduction in leakage and lost water with a resulting increase in pressure should be implemented by the vodokanal. This program is expected to increase the pressure provided to residents in the upper stories of apartment houses served by the vodokanal.

Technical assistance, if requested, should be provided in conjunction with the implementation of the proposed World Bank financed demonstration project and other distribution system related projects. The results of the demonstration project should be documented and then applied to other portions of the Atyrau Vodokanal service area as well as other Kazak vodokanals.

The completed hydraulic analysis of the Vodokanal should be reviewed to determine if the conditions of the original contract have met compliance. If the completed report satisfies these conditions, the consultant should be paid and the report released. If there are significant discrepancies between the completed project and the original agreement, the consultant should be given the opportunity to revise his work and then be compensated for his initial efforts. If no agreement can be reached with the consultant, a new report from a new consultant may be desirable.

Additional hydraulic analyses should be conducted to determine if the cause of the major pressure loss lies within the connector pipes leading from the distribution system to the residential high rises. The interiors of connector pipes removed as part of the demonstration project should be examined to determine is major losses in hydraulic capacity have occurred as the result of scale and mineral build-up within these lines. If this is the case, additional treatment to reduce hardness and mineral content at the Kaztransoil treatment facility may be necessary. Also, "C" or conveyance factors for these pipes should be derived and pressure losses at various flows computed.