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**UNITED STATES
AGENCY FOR INTERNATIONAL DEVELOPMENT**

**Newly Independent States
Environmental Policy & Technology Project**

Contract #: CCN-0003-Q-00-3165-00

**Preliminary Investigation of Water, Sanitation, and
Environmental Health Conditions of Crimean Tatar
Regions**

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1.0 INTRODUCTION

Under the 1992 Freedom Support Act, the United States Congress initiated a program to provide various forms of assistance to newly independent states (NIS) of the former Soviet Union. The U.S. Agency for International Development (USAID) was given responsibility to coordinate all U.S. government assistance to the NIS under the Act.

USAID awarded a contract to a team managed by CH2M HILL International Services, Inc. (CH2M HILL) to support implementation of an environmental assistance program to republics of the former Soviet Union. Under this contract, termed the Environmental Policy & Technology (EPT) Project, CH2M HILL is to assist USAID's missions in Moscow, Kiev, and Almaty undertake a program to promote environmental improvements in the NIS. The USAID mission in Kiev supports environmental, and other assistance programs to Ukraine, Belarus, and Moldova. These western republics of the former Soviet Union are termed WESTNIS. CH2M HILL has established an office in Kiev from which to perform services in the WESTNIS region under the EPT Project.

The United States Ambassador to Ukraine expressed concern over the current Tatar repatriation situation in Crimea (Figure 1), particularly water and environmental health issues. USAID/Kiev offered to arrange an initial review of the situation. Assistance from the EPT Project Kiev regional office was requested from USAID/Kiev.

A representative of the USAID/Kiev mission, and the EPT Project, travelled to Crimea between 23-30 July 1994 to conduct a preliminary evaluation of possible projects that could improve environmental health conditions for Tatar populations returning to Crimea. The scope of work was to assess water supply, wastewater, and solid waste disposal facilities in the Tatar-occupied regions of Simferopol. If feasible, a rapidly implementable project that would improve any of these conditions was to be identified that was within a pre-established USAID budget. The EPT Project was to prepare a draft report that presented a brief description of observations, and suggest one or more feasible, relatively low-cost options for improving water supply, sanitation, and/or environmental health of the Simferopol Tatars, with an initial estimate of the cost of each suggested option. The USAID/Kiev mission set an upper budget limit of US \$600,000 for any assistance project that might be identified during this preliminary evaluation.

Most information presented in this report was acquired through a series of interviews with government agencies, local officials, and individuals, in addition to observations made through field visits to selected sites. The interviewing process was conducted through an interpreter. Information received from one agency source was sometimes contradicted by information received by another and often many government agency representatives were not aware of the functions of other regional agencies.

Initial investigations were carried out in Simferopol. Through recommendations of local agency representatives and information gained through interviews, the city of Bachcisaraj was added to the geographic area of this investigation. Bachcisaraj and Simferopol (Figure 1) have large concentrations of repatriated peoples, and it was reasoned that these two areas could provide representative data. The range of possible projects for improvement of water supply, sanitation, and/or environmental health was limited by the USAID budget of \$600,000 and only possible projects that could be accomplished within that budget were considered in this investigation.

2.0 BACKGROUND

2.1 Crimea Region

Crimea, in southern Ukraine, covers a land mass of some 27,000 km² and is home to over 2.7 million people. Given to Ukraine by Nikita Khrushchev in 1954, it has long been the vacation spot for much of the former Soviet Union, with large numbers of tourists visiting during late summer. Crimea has a large agricultural industry, a result of irrigation made possible by canals built in the early 1960s to channel waters from the Dnipro River. Prior to canal construction, all water supply came from ground water. The majority of Crimean population is Russian, due primarily to Soviet Union deportation policies at the end of World War II that allowed only Russians and Ukrainians to remain in the region.

Since 1989, Tatar, Bulgarian, and other deported ethnic groups have been returning to Crimea. Portions of this repatriation were planned and a Ukrainian government institution, the Committee for the Tatars, functions to assist the repatriation as well as build housing and supporting infrastructure. This plan, put in to effect in 1989, calls for infrastructure development at the municipal level, but a lack of available funding has reduced its effectiveness. Although 300 Crimean communities are within the repatriation plan, the focus of this report is the cities of Simferopol and Bachcisaraj in the southwest region, the site of large concentrations of repatriated peoples.

2.2 Water

For the last two years, Crimea has been suffering dry to drought conditions. This situation is exacerbated by the presence and continued return of Tatars and other ethnic repatriation peoples.

Prior to 1961, the Crimean water source, both domestic and for irrigation, was ground water. Since then, through extensive reservoir construction in other parts of Ukraine and 400 km of canal to Crimea, some 350 m³/s of Dnipro River water is supplied to Crimea. Irrigated agriculture is the main use of this water, though it has been reduced somewhat in recent years. Extensive irrigation drainage has likewise been constructed and that drainage water is channelled to the Black Sea and Sea of Azov.

Of the total available canal water, some 85% is presently used for irrigation and 15% for drinking. Eight reservoirs in Crimea store water from both rainfall and canals. The current water consumption norm for Crimea is 235 liters per person per day. At the village level, that amount is higher, with 30% used for personal consumption and the rest for agriculture. The ground water table varies between 50 and 130 meters below the surface, with average water production of 1,000 to 2,000 m³/day. No ground water is currently used for irrigation purposes.

The State Committee on Water Resources oversees irrigation water demands in Crimea. Associated with that organization, the Hydrological Expedition performs water investigations related to irrigation. The Expedition undertakes mapping and topographical studies, testing and monitoring, and regulates irrigation practices. About 8,500 wells have been drilled for depth monitoring, 2,500 of which are annually sampled and tested. Surface waters are sampled and tested three times a year. Water quality testing includes a range of bacteriological, mineral, chemical, and metal contaminants, though laboratory testing for

chemicals and heavy metals are performed by the Crimea Chemical Organization under the Ministry of Agriculture. Some 37 water standards exist and are presently being modified by the Institute of Hydrotechnics and Amelioration of the Ukraine, based in Kiev. All water quality data is given to the Ministry of Environmental Protection. The Expedition has four light duty, truck-mounted drilling rigs, though only one was operational at the time of this evaluation.

The Vodokanal is the municipal government agency concerned with potable (i.e., drinking) water distribution systems for cities and towns (for smaller villages, the municipal director has this authority). It is responsible for installation and maintenance, has pipe stores and equipment, but is currently short of funds. It is not concerned with waste water. Plans exist for water to be supplied to all villages by the year 2,000. A conservation department of the Vodokanal educates the public through newspaper and radio announcements about water consumption issues.

The Ministry of Geology performs all subsurface exploration and development of hydrological, geophysical, and oil and gas resources, and has sole authority for potable (drinkable) water development of ground water. It has 12 well-drilling rigs of varying capacity, and is currently drilling eight wells in Crimea. Drilling costs are approximately 2,000,000 Karbovanets (US\$45, using July 1994 rate of 45,000 Karbovanets to \$US1) per meter for average water wells (30 cm diameter, 100 meter depth), with average drilling times of around eight meters per day.

The Krim Vodstroy is an independent organization responsible for the majority of all major water works construction since 1991. Located in Simferopol, it has around 3,000 employees and a moderate contingent of heavy construction equipment. For construction of municipal works, the Krim Vodstroy acts as a private contractor, whereby a contractual agreement is made between it and the government. The Committee for Capital Building, a municipal organization, then controls the project for the municipality.

2.3 Health and Sanitation

The Sanitary-Epidemiological Station (SES) is the component of the Ukrainian Ministry of Health concerned with environmental health and disease control. The SES has offices in most cities with promotional and laboratory testing capability, as well as representation at the village level. SES works with the Hydrological Expedition to monitor water quality and maintains records on public health issues such as disease rates and infant mortality.

The SES agency in Bachcisaraj has 40 "promoter-type" employees, although there were additional SES personnel from other offices working in the surrounding region. Their responsibilities include information-gathering and inspection, public communication, and water sampling at the community level, including the newly arrived Tatar communities. This SES office has a quality testing laboratory with capability for bacteria, viruses, chemicals, pesticides, and metals. It regularly performs testing of water (potable, storm, irrigation, sewerage, and sea), air, soil, noise, and agricultural products. Testing results are evaluated and community counsel given on the basis of those results.

The SES offices communicate with the public directly through their promoters as well as by radio, newspaper, lectures, and public posting of health literature. A public safety emergency plan exists whereby promoters distribute public health information on a door to door basis.

2.4 Repatriated Peoples

Repatriated peoples are living throughout Crimea. In several communities visited, new construction of Tatar homes is taking place. There are approximately 60,000 repatriates returning per year, with a present immigration total of 239,000. The majority (more than 90%) of this group is Tatar, with the remainder being Greek, Bulgarian, and German. The ethnic origin of the Tatars is Turkish. Some 300 repatriation regions have been established by the State Committee for the Tatars, an official Ukrainian organization addressing the repatriation issue. According to committee representatives, several types of assistance are provided. They include: assistance of between four and eight months of average salary for each family (depending on size), land for building in Crimea, utilities connections, and financial and technical assistance for home construction. Repatriated peoples must show documentation of former residence in Crimea prior to World War II in order to receive this assistance.

The reported 1994 operating budget for the State Committee for the Tatars was 540 billion Karbovanets (US\$12 million). Approximately two thirds of that amount has been spent. The committee reports that 1 trillion Karbovanets (US\$22.2 million) is needed to accomplish their repatriation goals.

The Committee of Building, a municipal level organization of seven groups for the construction of homes, streets, and public utilities connections, plan and assist the construction of repatriated people communities. This building committee is made up of local people working under the jurisdiction of the municipality, the organization in control of construction.

3.0 OBSERVATIONS

3.1 Simferopol

About 90% of water utilized is surface origin. Some 90% of the 372,000 people of Simferopol are served by a water distribution system. Water demand is about 280,000 m³/day. Around 160,000 m³/day is supplied at this time, mainly through four reservoirs, Ayanska, Simferopol, Patinanska, and Meshgournya. The first three are rained-filled. The Meshgournya reservoir (capacity 50,000,000 m³) is supplied from the Dnipro River and is presently at 70% capacity. The Simferopol reservoir (capacity 36,000,000 m³) is currently operating at one-sixth of its capacity due to dry conditions that have persisted in the region for the last two years. The Meshgournya water treatment plant has sand filtration and gas injection chlorination that appear to be in good operational condition. The treatment plant water quality laboratory does testing for bacteria, pesticides, and metals. Water rationing currently exists in Simferopol on a variable schedule.

New home construction, all of practically the same material (quarried sand stone) was observed in many locations at the outskirts of the city, as well as infrastructure construction (electricity, water, and streets). Local government representatives reported that this was construction of new Tatar homes. There was no evidence of any "tent cities" or that the Tatars were living in the unfinished homes. Reportedly, they were living temporarily with relatives, in hotels, and in rented apartments.

3.2 Bachcisaraj

This former capitol of the Tatars has a current population of around 35,000 people. An additional 20,000 people live in surrounding villages and farms. Over the last four years, about 20,000 people have immigrated to this area. Some 18,000 people are expected to immigrate within the next five years.

Current water supply is 11,250 m³/day, the majority of which comes from the Vilinski well site (8,000 m³/day), and the rest from several wells in and around Bachcisaraj. The Vilinski well water is chlorinated. Water demand projections for the year 2,000, including irrigation (33%), show Bachcisaraj and its surrounding municipality needing around 36,000 m³/day. An addition to the water system is under construction that will supply a further 25,000 m³/day. The storage facilities, pumping station, and about 10 km of the 19 km transmission line, are complete. Due to a lack of funding, the rest of the transmission line pipe (about 9.5 km) cannot be purchased.

The Bachcisaraj waste water treatment plant has a current capacity of 3,500 m³/day. The plant is being upgraded to handle an additional 15,000 m³/day, although construction has stopped due to a lack of funding. Present treatment consists of grit removal and screening, primary sedimentation, and biological filters. Sludge is dried and then disposed via landfill. The planned upgrade includes primary sedimentation and aeration chambers. Sedimentation tanks were partially constructed as part of the upgrade. Assistance was requested for completion of the sedimentation tanks and construction of aeration tanks. Specific information on funding need was not available at time of preparing this report.

Inspections of Tatar communities construction surrounding the city revealed a situation similar to that encountered in Simferopol. Large numbers of homes and supporting infrastructure were under construction. Planning of these communities is carried out at the municipal level through building committees. There was no evidence of massed populations living in close quarters or adverse conditions. On the contrary, there were very few people actually living at the construction sites. Authorities reported that most people were living with relatives, in hotels, and rented apartments. Interviews were conducted with individuals from four houses under construction in a Tatar community. The interviews revealed that these people were building their houses "with their own materials and their own hands" and had been doing so for between one and three years. There appeared to be little direct government assistance from the building committee for individual home owners other than land and municipal infrastructure. Large amounts of construction material, quarried sandstone and pre-fabricated concrete slabs, were seen piled-up throughout the community. A construction materials plant that produced slabs, blocks, and other materials, was located nearby and employed people from the community. A private company quarried and sold the sandstone blocks. Water was being trucked to these communities once a week, delivered on a house-by-house basis and stored in containers of varying sizes. Most people had separate containers for drinking water. All houses visited had latrines in reasonable condition. The area appeared reasonably clean and a landfill-type dump was located nearby. Some houses visited in Bachcisaraj had water meters installed.

3.3 Summary of Observations

Extensive housing construction was seen on the fringes of both Simferopol and Bachcisaraj, mainly for repatriated peoples. No large numbers of people were seen "camped out" in the

construction areas, and local municipal authorities, as well as the interviewees, reported that most repatriates are living in adequate, self-provided housing. The communities visited appeared clean, and adequate latrines were being used. According to the Crimean Tatar Organization, repatriation is expected to reach a total of 350,000 people by 1996. This will put an extra burden on water supply and sanitation systems. Plans at the national level are in place to construct supporting infrastructure for these repatriates, though a lack of funding could delay implementation and worsen water supply shortages as well as create environmental sanitation problems.

There are several government institutions dedicated to water management, some of which appear to be well-staffed and have a reasonable appraisal of current Crimean water needs. The public health agency (SES) appears competent in its ability to measure and control public health/environmental issues with a contingent of community level, promotional personnel, reasonably equipped, well staffed testing laboratories, and the capacity to inform and counsel the public. Some supply stock for basic laboratory testing is needed at the Bachcisaraj water quality laboratory as well as some, as yet, unidentified diagnostic equipment.

Currently dry to drought conditions exist throughout Crimea, the effects of which are worsened by extensive use of canal water for irrigation. Water is being rationed in most cities, and reservoir storage is 60% to 70% of capacity.

Table 1 presents details regarding existing water supply and sewerage availability to the people of Bachcisaraj and surrounding communities:

Table 1
Population in Bachcisaraj and Surrounds Served by Existing Piped Water & Sewerage Facilities

	Bachcisaraj	Surrounding Areas	Additions by Year 2000	Total	% of Population Served
Population	35,000	20,000	18,000	73,000	Not applicable
Population with piped water service	28,000	0	0	28,000	38%
Population with sewerage service	20,000	0	0	20,000	27%
Sewerage treatment capacity	15,000	0	0	15,000	21%

An introduction of running water to homes without sewer connections could cause sanitary problems through the increase in liquid waste. This would have to be addressed by additional sewer lines as well as treatment capacity. Further study is needed to determine exact quantities of pipe and installation equipment needed. Homes without sewer connections use latrines and septic tank type systems. Both of these require sludge removal. The water supply system improvement at Bachcisaraj, as well as the waste water treatment plant upgrade are currently stalled due to a lack of funding.

4.0 POSSIBLE ASSISTANCE

Based upon observations and interviews, several possible assistance initiatives were identified. These initiatives, requested by local municipal agencies, would compliment existing efforts, and could help prevent possible severe water and sanitation problems from developing. Based on the initiatives, a possible USAID assistance project was identified which would have the following components:

- 1) funds to purchase pipe in order to finish a water transmission line for service to the city of Bachcisaraj and surrounding areas that could ultimately supply drinking water to an additional 45,000 people
- 2) purchase and deliver basic water quality testing material and diagnostic equipment for the Bachcisaraj SES water quality laboratory
- 3) funds to upgrade the Bachcisaraj waste water treatment plant, sewage transmission infrastructure, and home level sanitation facilities.

Component #1 would require the local procurement of 9,500 meters of steel pipe needed to complete an 18-kilometer water transmission line for service connections in Bachcisaraj and surrounding regions. This project component is dependent on an agreement between the cities of Bachcisaraj and Sevastopol concerning the Bachcisaraj use of the entire water output of the Vilinski well site. This water had been shared with Sevastopol. According to Bachcisaraj municipal leaders, this agreement has been made. However, any assistance to this water supply project should include the condition that the agreement be binding. Necessary implementation staff of this possible project would include a civil engineer to provide technical management support to assist in local procurement, and insure proper installation and operation.

Component #2 would require procurement in the United States of an assortment of water quality testing material and delivery to the Bachcisaraj SES testing laboratory. This material includes membrane filters used in biological tests and would reduce current SES testing times by two thirds. A materials list has been presented by Bachcisaraj SES officials.

Component #3 would involve improvements to sewage treatment facilities. Several options are available, including:

- Funding construction, and/or procurement of U.S.-based equipment, to finish additions to the Bachcisaraj waste water treatment plant. A detailed description of this project by local authorities was not available at the time of preparing this report; only that the additional treatment capacity would be 15,000 m³ per day (enough to serve about 60,000 people), and construction started in 1990. Two sedimentation tanks are 90% complete. Construction of the aeration chambers as well as some additional material and equipment are needed.
- Funding improvement of home-level sanitation facilities in the Bachcisaray area. This would require local assistance for septic and latrine systems at the home level, and procurement and delivery from the U.S. or mobile sludge-pumping equipment. Further investigations are required to determine exact needs for completion of this component.

Necessary implementation staff of component #3 would include a civil engineer to investigate and assess the waste water treatment plant's material and equipment needs, procure that material and equipment, and provide technical management support to insure proper installation and completion of the plant. This same staff could perform further investigations of sewerage transportation and home level sanitation facilities, make recommendations for improvement, and implement the necessary procurements and/or technical management support.

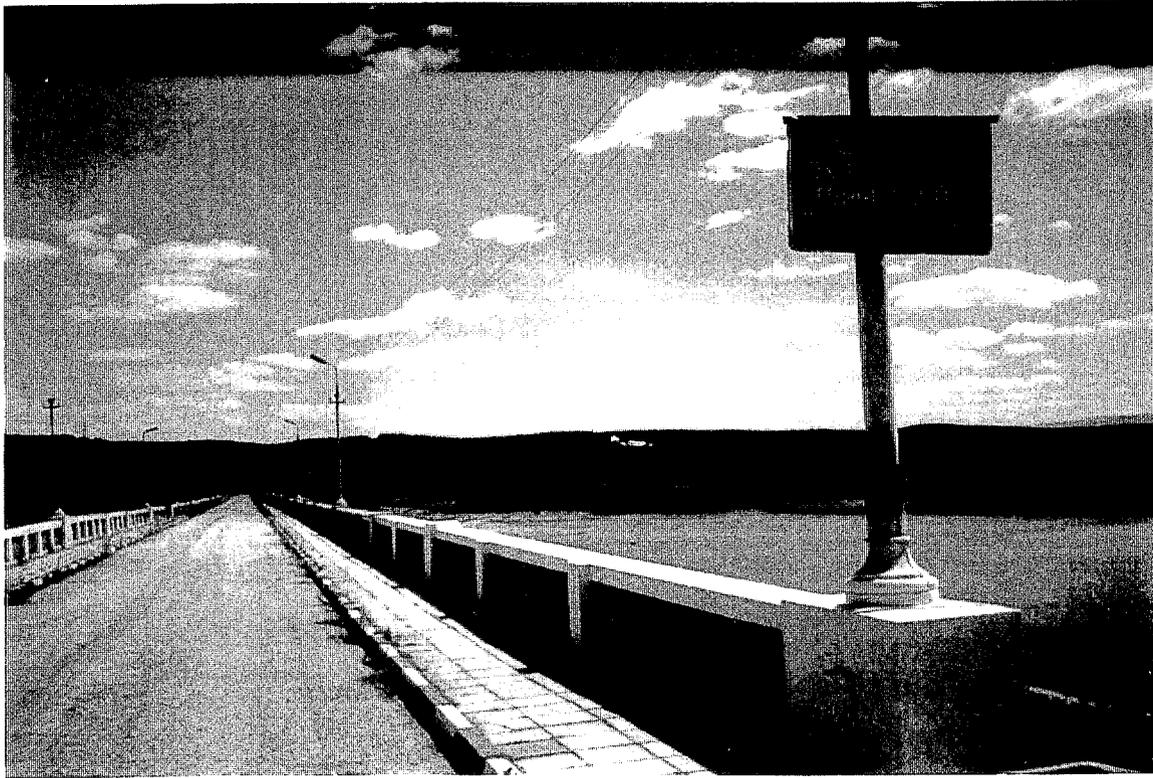
A preliminary budget is provided in Appendix A. Actions needed to implement the project components are listed in Appendix B. Actions in this appendix include obtaining a "letter of request" from an appropriate Ukrainian agency seeking USAID assistance, and "memorandum of understanding". Appendix C presents items that should be considered when preparing these two documents.

5. REPORT PREPARATION

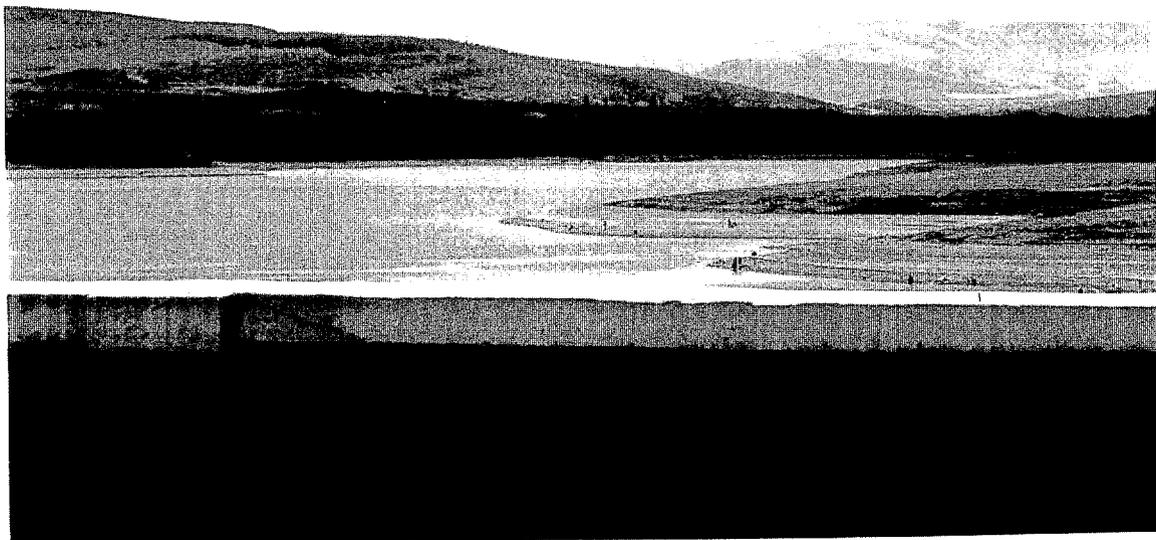
EPT Project Regional Manager: Ties van Kempen
Task Manager Brad Carr, civil engineer

The EPT Project also acknowledges the considerable assistance provided by USAID/Kiev representative Ms Janelle Daane.

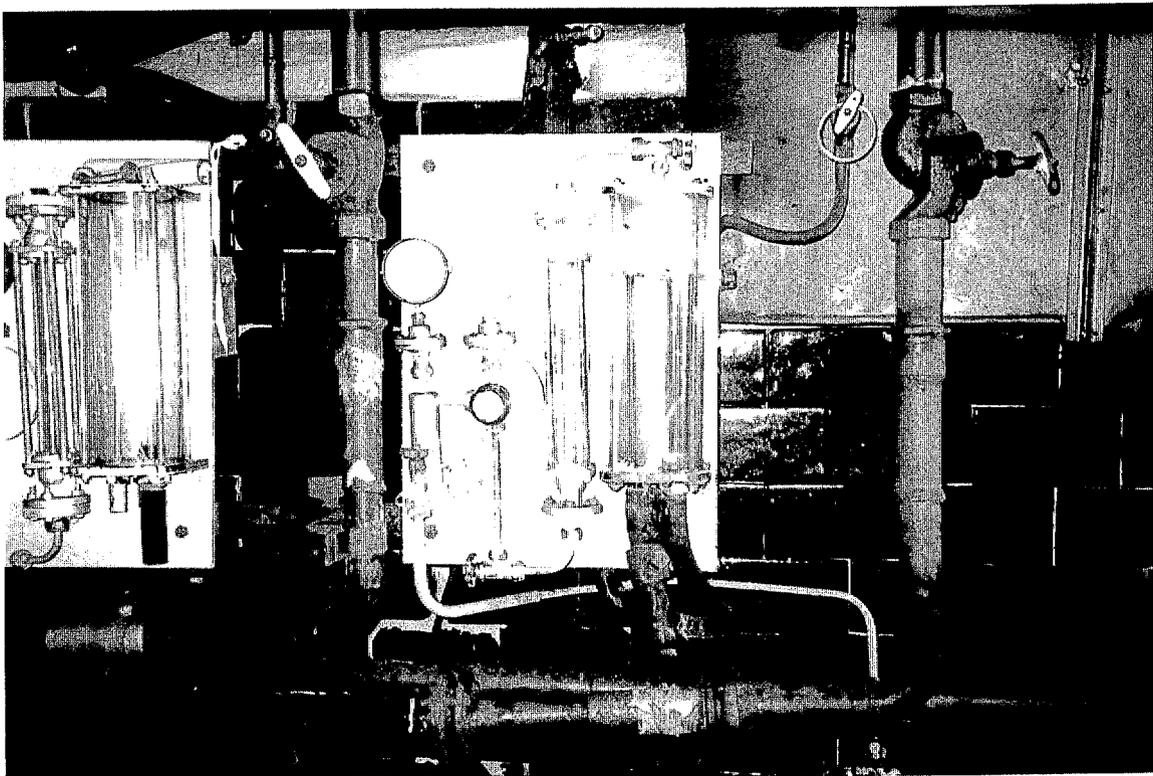
SIMFEROPOL RESERVOIR



REDUCED STORAGE DUE TO DRY CONDITONS

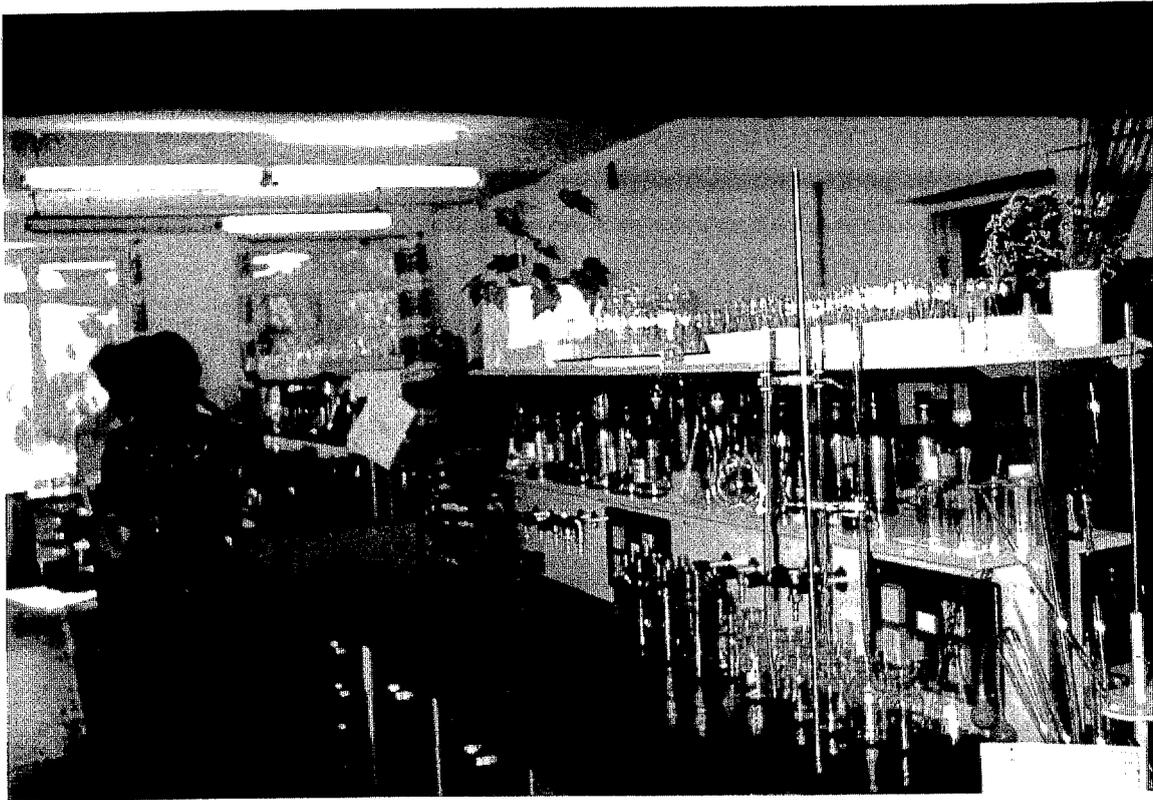


MESHGOURNYA RESEVOIR

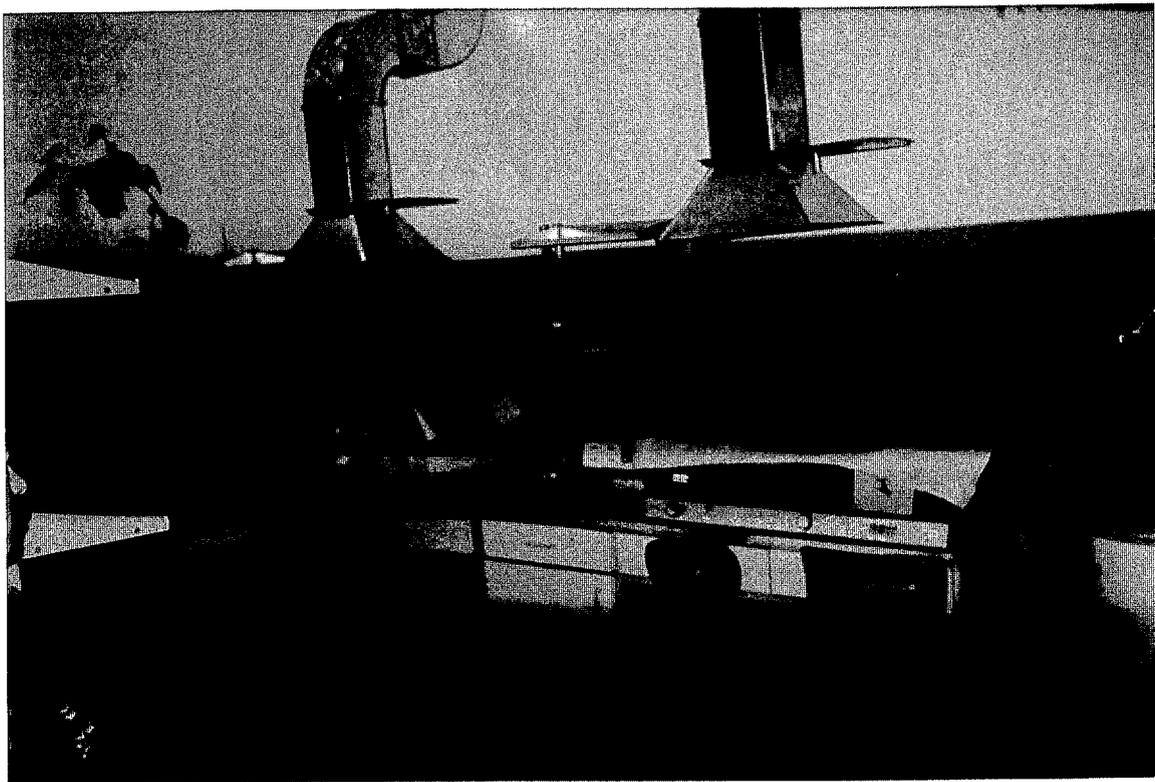


GAS CHLORINATION INJECTION EQUIPMENT

HYDROLOGIC EXPEDITION



WATER QUALITY LABORATORY



INCOMPLETE, UNUSED CHEMICAL TESTING EQUIPMENT

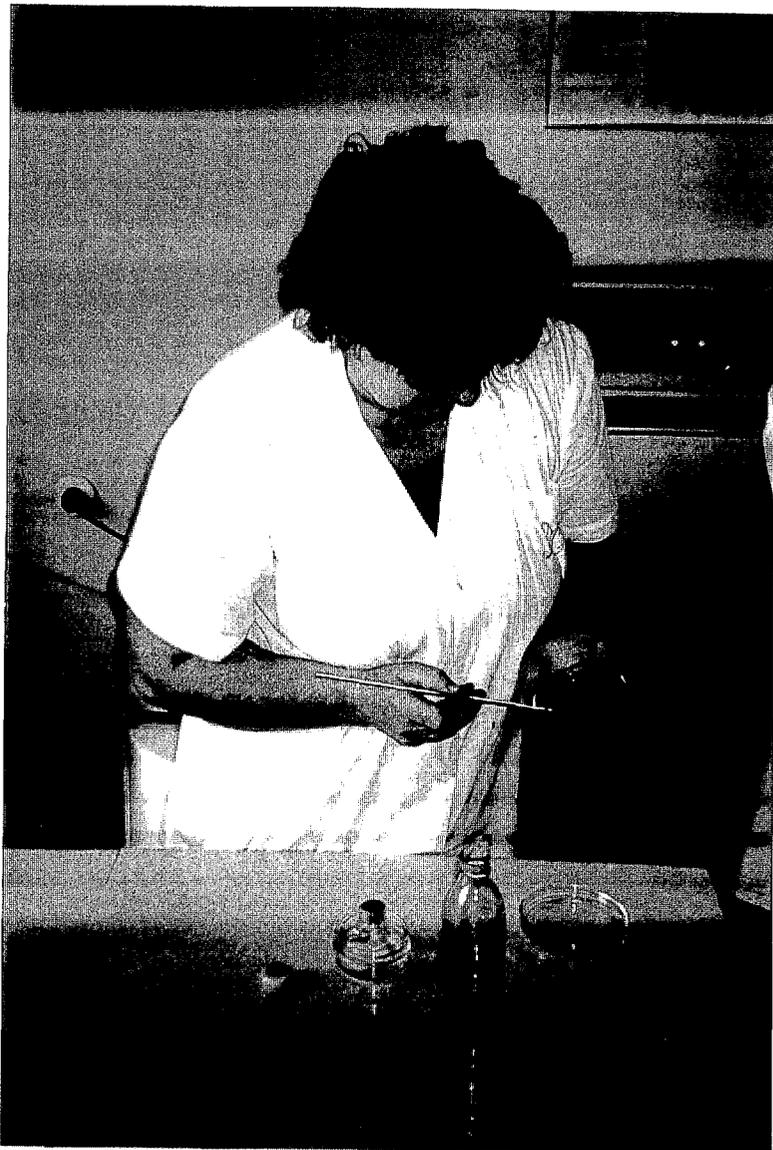
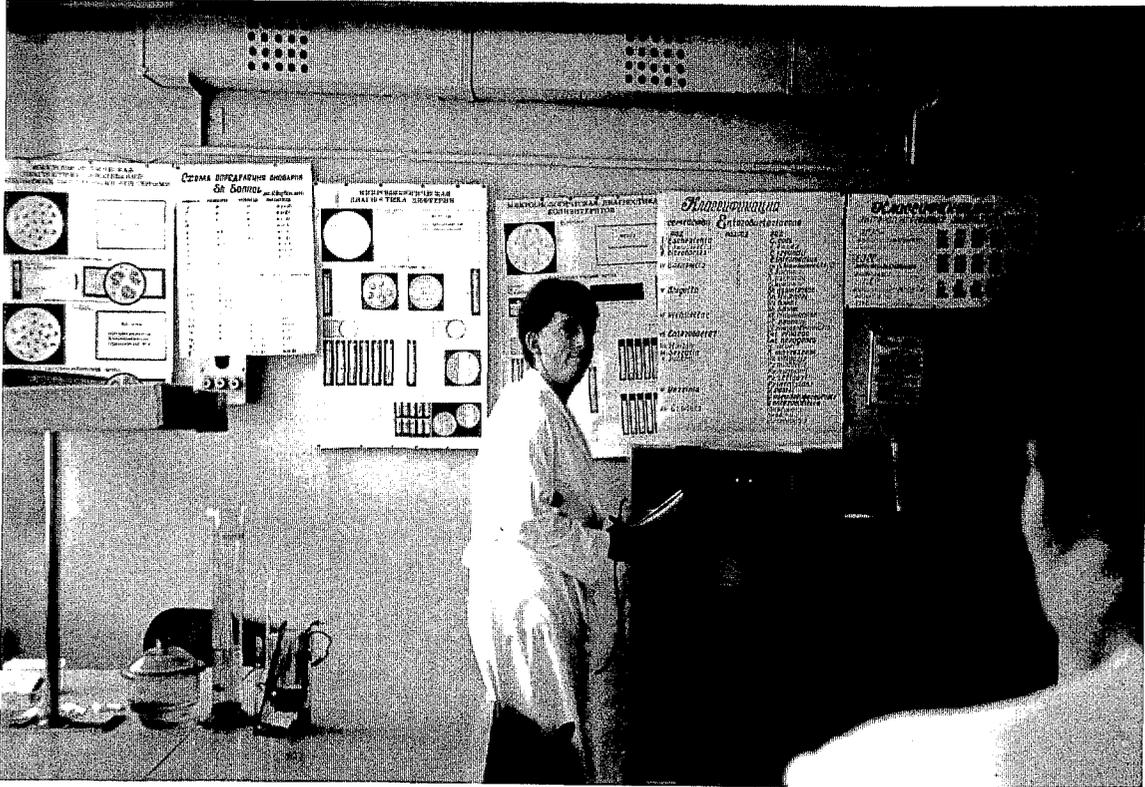


**TEAM MEMBERS INTERVIEW HYDROLOGIC EXPEDITION STAFF - NOTE
DRILLING RIG IN BACKGROUND**



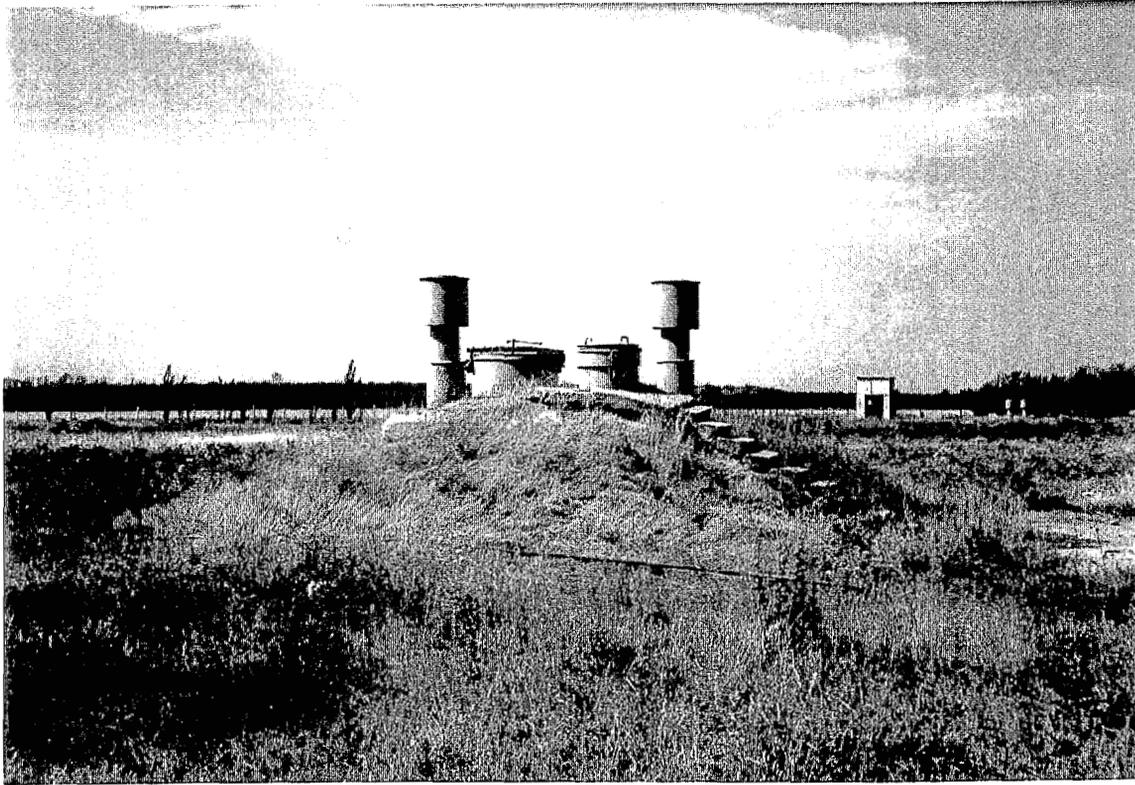
TEST LOG SHOWING NO BIOLOGICAL COLONY COUNT

SES BIOLOGICAL TESTING LABORATORY BACHCISARAJ, CRIMEA

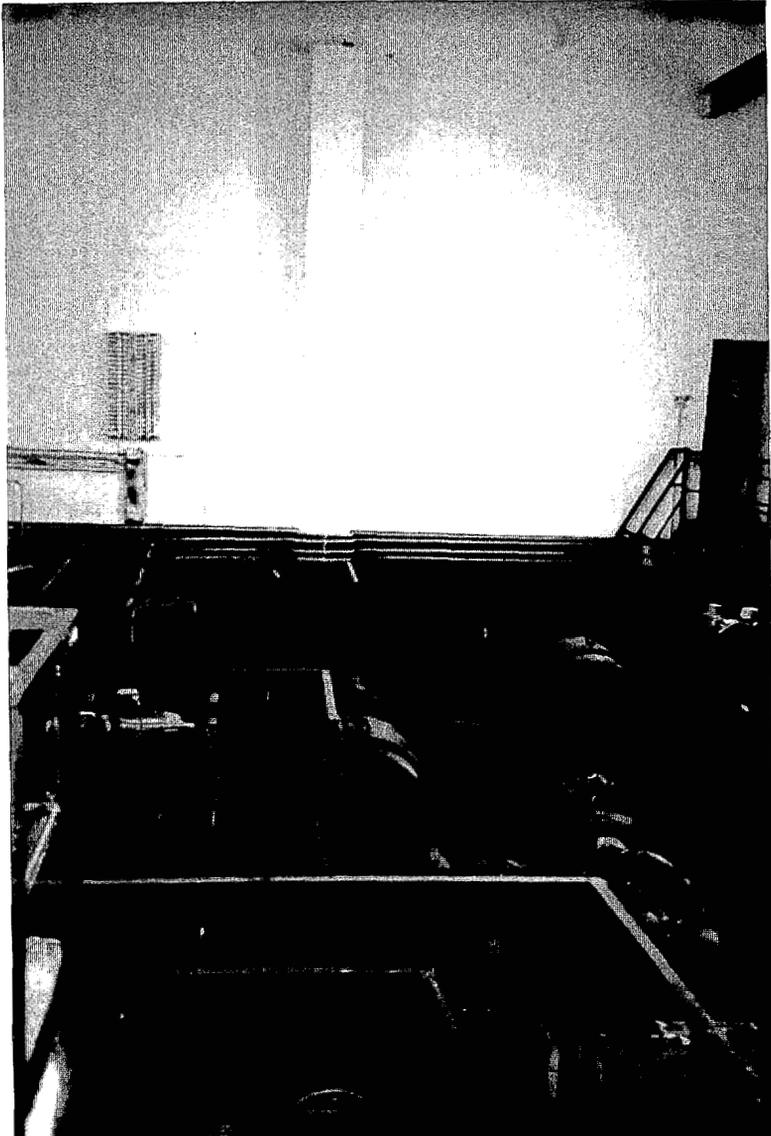


**WATER LAB HEAD
DEMONSTRATES STANDARD
METHODS USED FOR LACK OF
MEMBRANE FILTERS**

WATER SYSTEM AT BACHCISARAJ



VILINSKI WELL SITE



PUMPING STATION



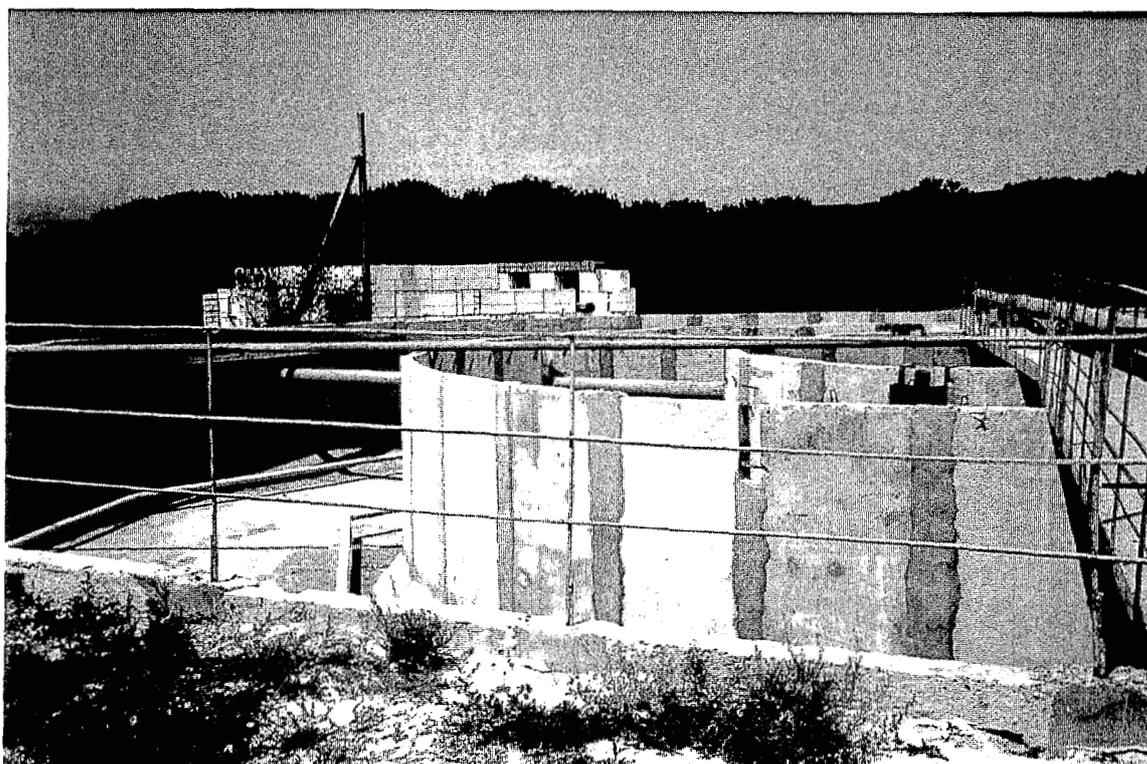
INCOMPLETE TRANSMISSION LINE



BACHCISARAY WASTE WATER TREATMENT PLANT



EXISTING PRIMARY SEDIMENTATION TANKS



**PRIMARY SEDIMENTATION TANKS UNDER CONSTRUCTION
(CONSTRUCTION HAS PRESENTLY STOPPED)**

NEW HOUSING CONSTRUCTION, BACHCISARAJ AND SURROUNDING AREAS



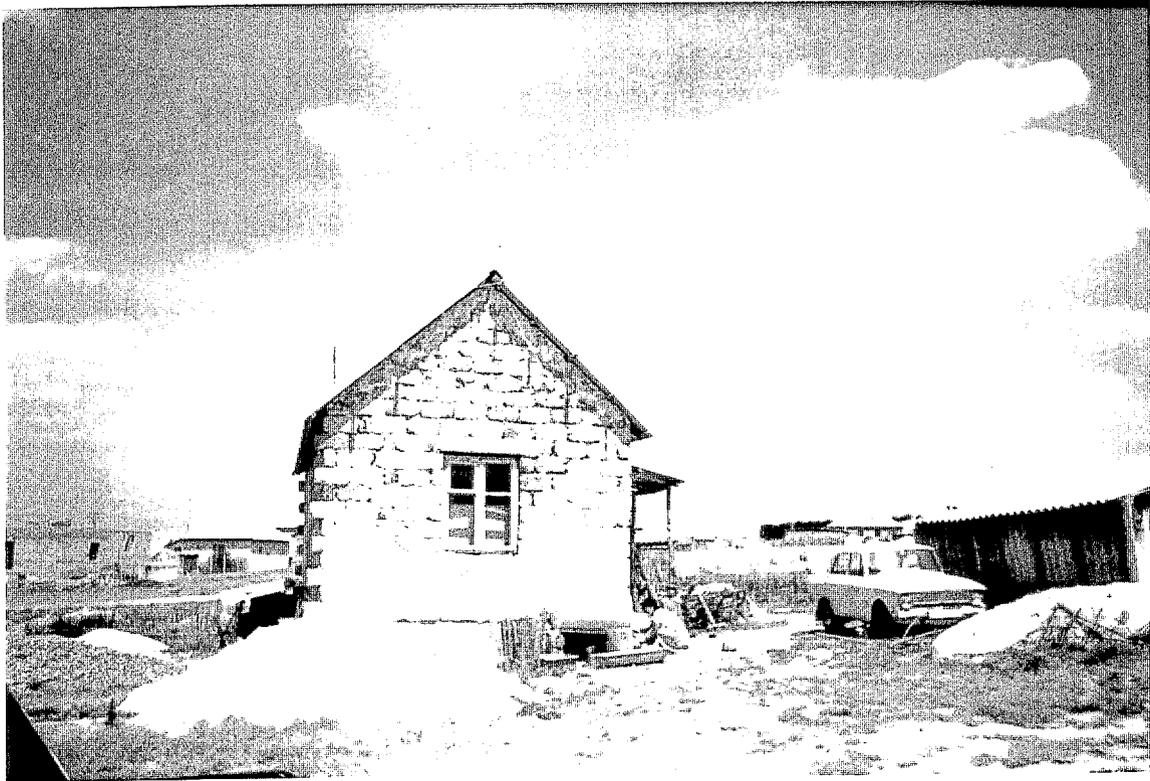
NEW HOMES BEING CONSTRUCTED





HOUSING CONSTRUCTION MATERIAL AND WATER MAIN PIPE

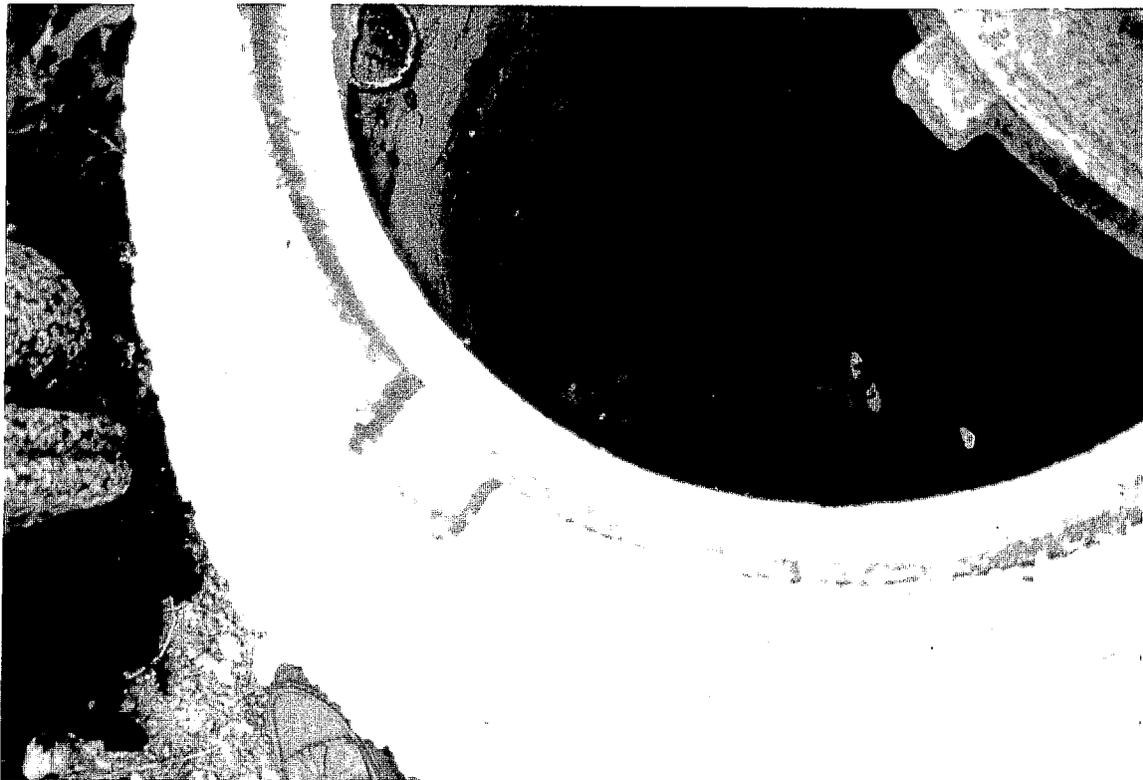




HOME WATER STORAGE



LATRINE FACILITIES



METERED WATER CONNECTION



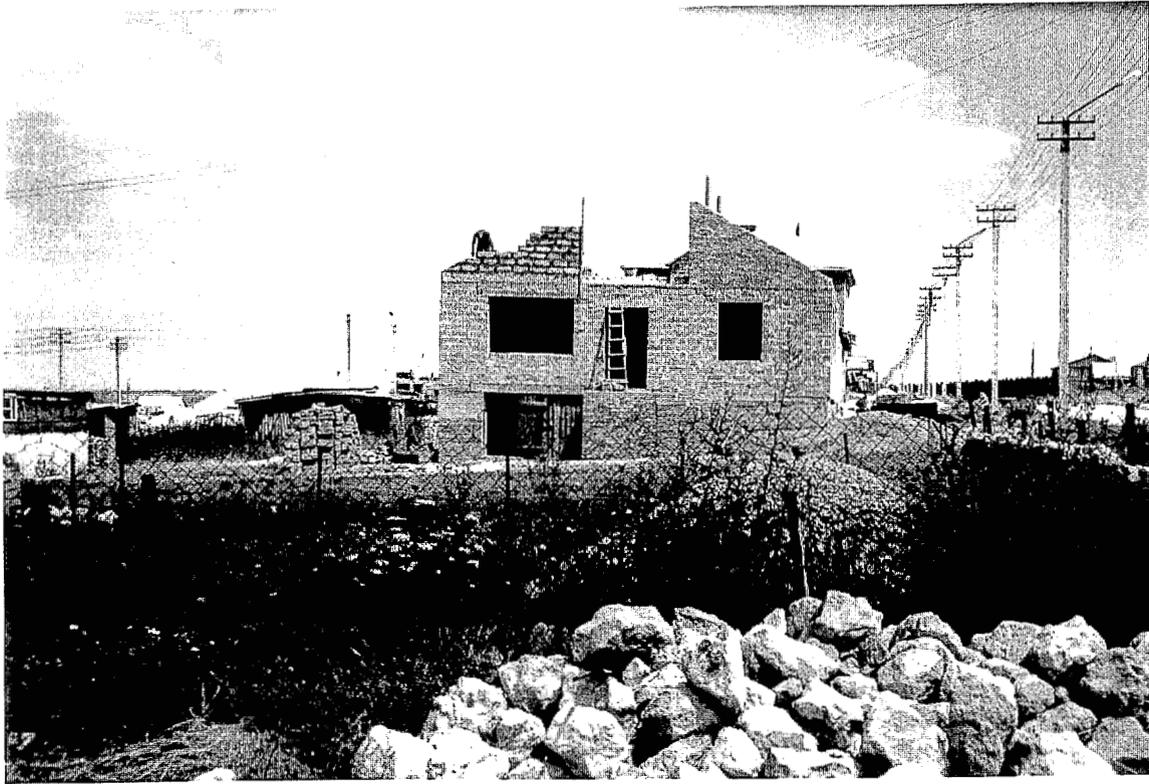
SEPTIC TANK SYSTEM

HOME VISITS TO CONSTRUCTION AREAS SURROUNDING BACHCISARAY

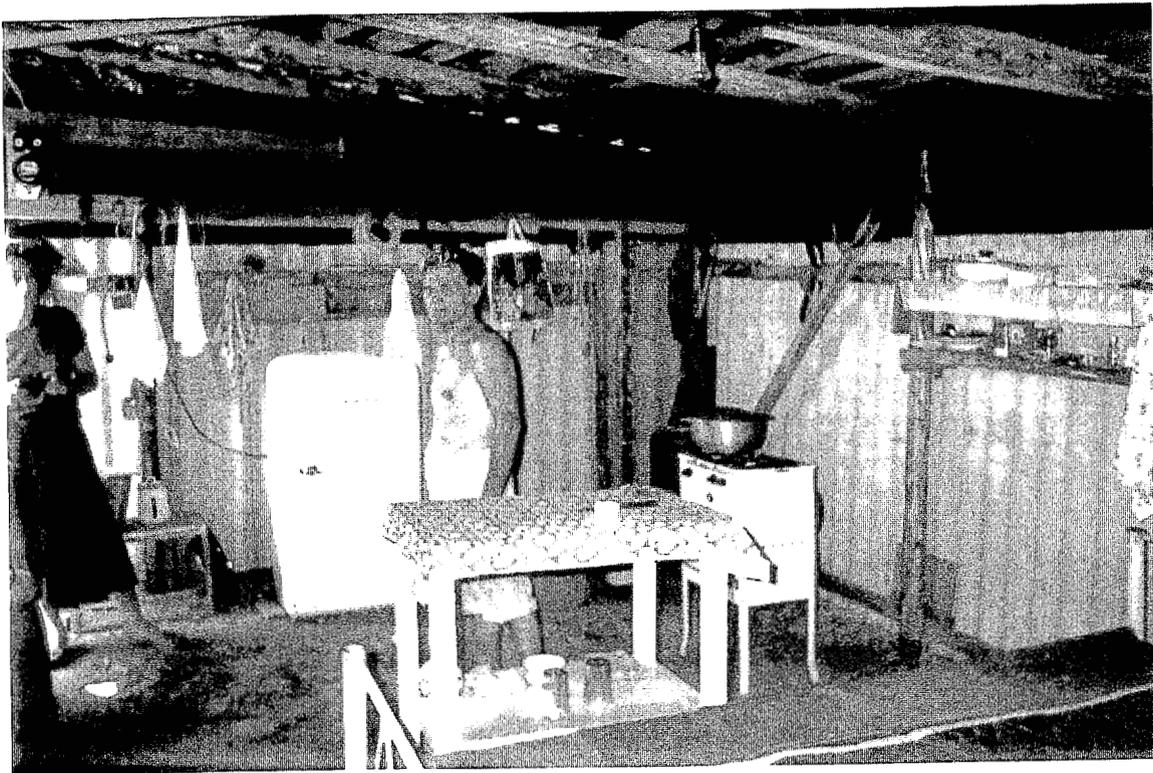


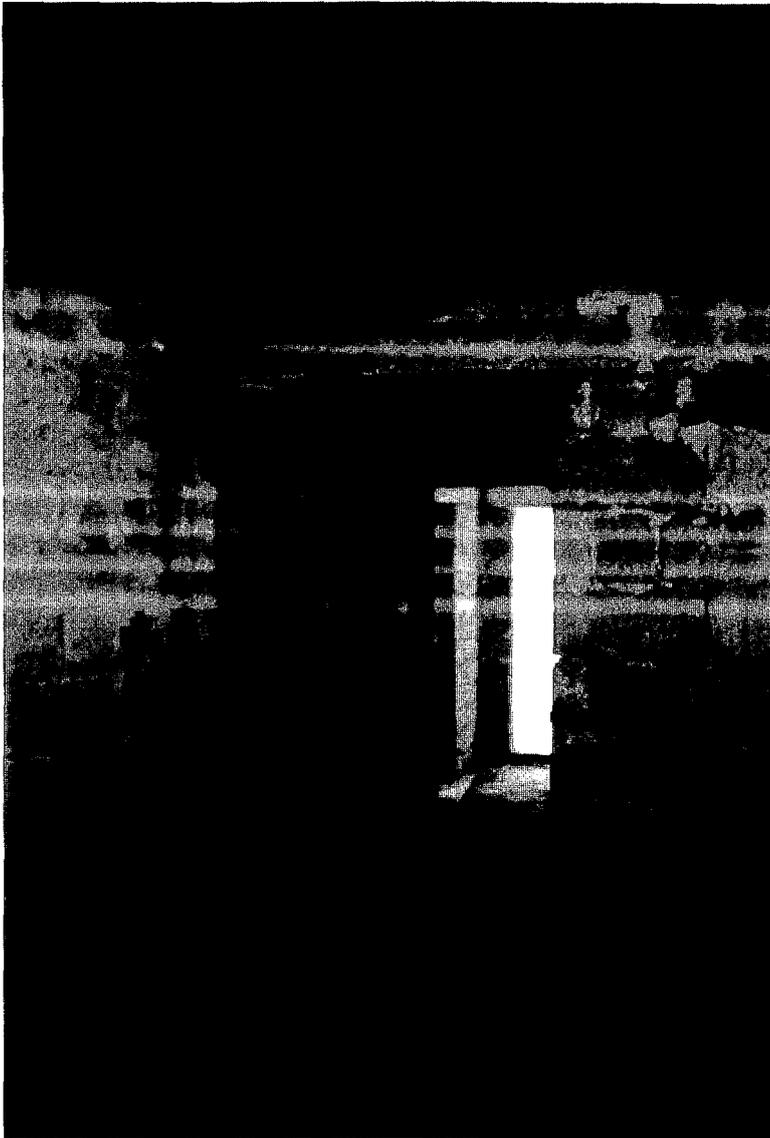
There were four persons living in the house, in background of above photograph. They had been here for one year and had come from Uzbekistan. The house under construction has electricity, and water is delivered once a week and stored in the trough (for washing) and barrel (for drinking). This family received some financial assistance in Ukraine and the land for their house. Everything else, building materials, labor, food, etc., they are providing themselves. Construction material were generally quarried sandstone blocks.





The house under construction in the above photo had a family of five although only two men were present doing the construction. The family came from Uzbekistan in 1989. The land for the house was free with documentation of former Crimean residence. No assistance was received and all construction and materials are provided by the family. The two men constructing the house live in a small shack, pictured below.

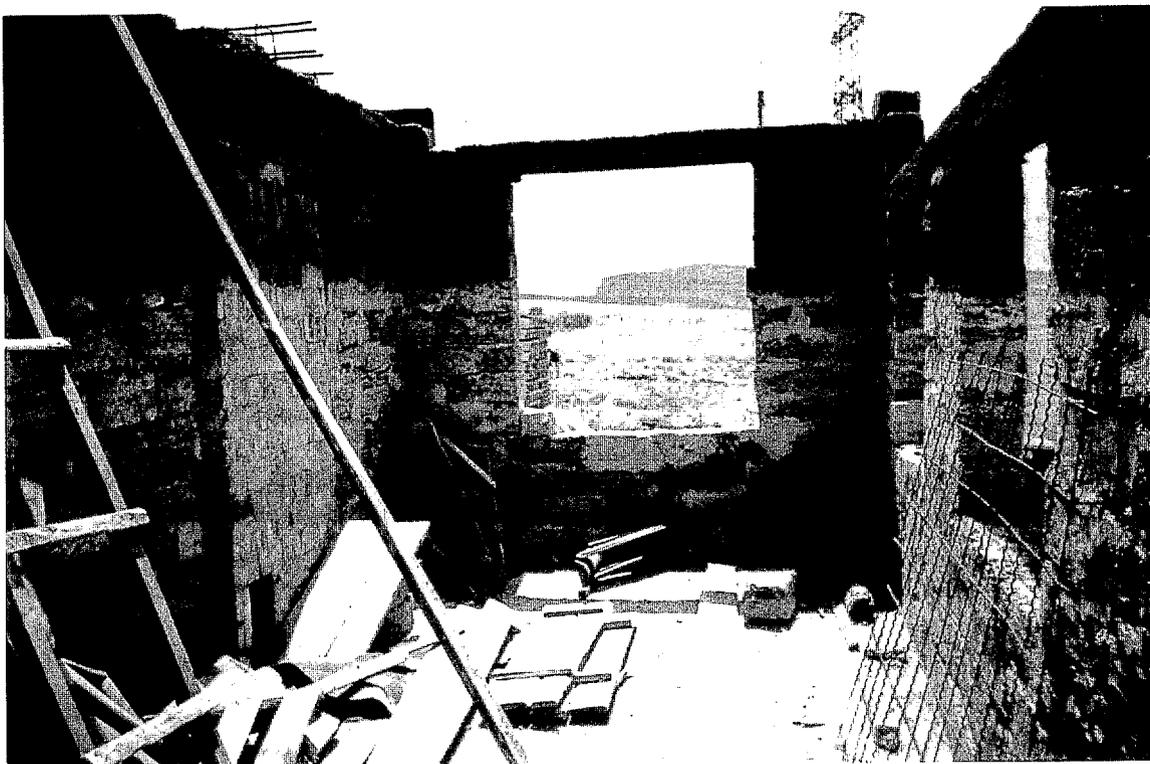


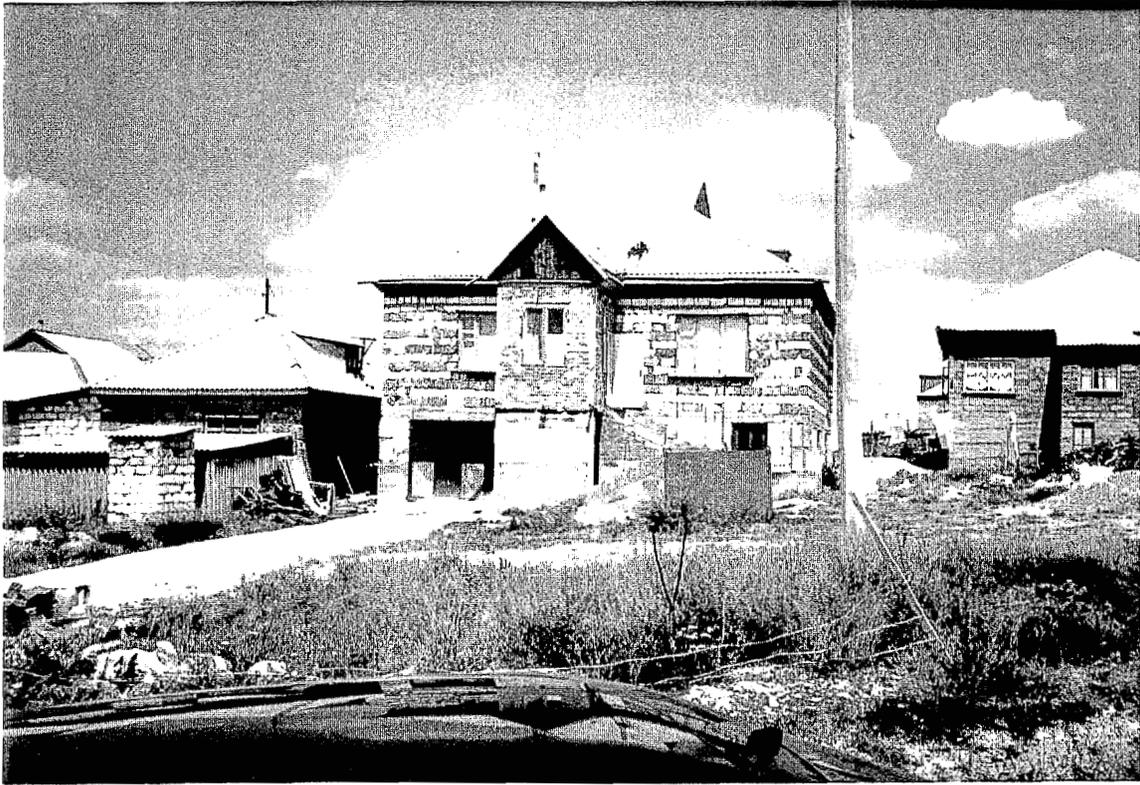


The construction materials used for the house in the two photos are quarried sandstone, and prefabricated concrete. The stone is sold by a private company that delivers on site and the prefabricated floor slabs are purchased from a manufacturing plant located in the vicinity. The concrete beams used as headers are made on site by the two men.



This house had been under construction for three years. The Tatar family of six live in an apartment at another location and visit the construction site daily. The husband of the woman pictured is employed at the pre-fabricated materials plant. The family received no government assistance, other than the land, and are presently building with only their own resources. This house appears of poorer quality and smaller than the others visited. Construction materials are pre-fabricated concrete slabs, wood beams, and quarried sandstone.





This home was complete and a family of around six were living in it. The family came from Uzbekistan four years ago. Reported that they had a good life in Uzbekistan but had returned because this was the home of their ancestors. One woman interviewed was a biologist. The house is well furnished, has modern furniture, electricity and heating. The family uses a ventilated latrine, made of pre-fabricated concrete components that will be pumped out by the city when full. Water is stored in a large metal tank in front of the house, with separate storage for drinking.



APPENDIX A

PRELIMINARY BUDGET FOR POSSIBLE ASSISTANCE PROJECTS (July 1994 exchange rate is 45,000 karbovanets \$US1)

Estimated Equipment/Material Costs:

- **Component #1** (9.5 km of 720 mm steel pipe to finish water transmission line)

9,500 m x 15.5 million Karbovanets per 13 m section = 11.34 billion Karbovanets or \$252,000 (transportation included)

 - **Component #2** (Miscellaneous Laboratory Equipment to Upgrade SES Water Quality Lab)

Bachcisaraj SES Laboratory Equipment - \$40,000

 - **Component #3** (Sanitation Component)

Options - \$150,000:
 - Improvements to Bachcisaraj Waste Water Treatment Plant, or
 - Upgrade of Sanitation Facilities at Individual Homes in Bachcisaraj, or
 - Sewer Line Installation, or
 - Sludge Pumping Equipment (truck mounted)
- Total Estimated Equipment/Material Costs = \$442,000

Estimated Labor Costs:

Task Leader: 120 d @ \$350/d	=	\$42,500
Core Contract home office support (assume)	=	\$60,000
Local Engineer: 60 d @ \$70/d	=	\$4,200
Translator: 100 d @ \$80/d	=	\$8,000
Driver: 100 d @ \$40/d	=	\$4,000
Total Estimated Labor Costs:	=	\$118,700

Estimated Direct Costs:

International Airfare: 2 @ \$3,500	=	\$7,000
Local Air Fare: 6 trips @ \$300 each	=	\$1,800
Expat Per Diem: 168 d @ \$220/d	=	\$36,960
Car Rental: 100 d @ \$50/d	=	\$5,000
Driver Per Diem: 100 d @ \$50/d	=	\$5,000
Translator Per Diem: 100 d @ \$50/d	=	\$5,000
Misc. (visa, taxis, communications, translation):	=	\$2,000
Total Estimated Direct Costs:	=	\$62,760

Contingency (approx. 4%): = \$26,540

Total Estimated Possible Project Costs: = **\$650,000**

APPENDIX B

FOLLOW-UP ACTIONS NEEDED IN ORDER TO IMPLEMENT PROJECT

1 **USAID Washington Approval**

J. Daane presents short version of Tatar/Bachcisaraj report, gets agreement to proceed with project.

2 **Environmental Assessment**

Prepare - CH2M HILL

Approve - USAID/Kiev

3 **Letter of Request From Relevant Ukrainian Authority**

From whom?

Who will be part of work agreement?

4 **Memorandum of Understanding**

Preparation

Composition

Negotiation

5 **Prepare and Approve Work Scopes**

6 **Money: Approval of WESTNIS Delivery Orders**

7 **Improve Project Design and Cost Estimation**

8 **Pipe**

Cost

Purchasing Method

Availability - Visit pipe plant

Specifications/Pipe Quality

Transportation

9 **Commodities - Procurement**

Pipe - local

Lab Equipment - CH2M HILL

Waste Water Treatment Equipment - CH2M HILL

10 **Sanitation Component**

Technical Assistance

Further Investigations

Who will purchase?

Local official role?

How to obtain best price?

APPENDIX C

ITEMS TO BE CONSIDERED FOR INCLUSION IN LETTER OF REQUEST, AND MEMORANDUM OF UNDERSTANDING

- 1) Signatories:
 - Ukraine:
 - a) Deputy Prime Minister of Crimea, Mr. Saborov
 - b) Head of Tatars, Mr. Lutvi Osmonov
 - c) Mayor of Bachcisaraj, Mr. Taryonic Alexander Ivonovich
 - U.S.
 - a) U.S. Ambassador, Mr. W. Miller
 - b) USAID Mission Director: Mr. T. McMahon
- 2) What is requested?
 - a) Bachcisaraj water system improvement; 9,500 meters of 720 mm water pipe.
 - b) SES water laboratory testing material and equipment.
 - c) Assistance for completion of Bachcisaraj waste water treatment plant, and/or Bachcisaraj sewer line installation, and/or Bachcisaraj home sanitation facilities improvements.
 - d) Technical assistance for municipal utilities cost recovery strategies.
- 3) Beneficiary Commitments:
 - a) Water supply for Bachcisaraj system improvement, in order to insure system users with adequate water (35,987 m³/day ?)
 - b) Delivery of water pipe purchased with USAID from manufacturer to construction site
 - c) Install and test all components of Bachcisaraj water system, including transmission line, residential street mains, and service box connections.
 - d) Install and use laboratory testing material and equipment provided by USAID.
 - e) Use USAID funds for completion of waste water treatment plant, and/or installation of sewer lines, and/or home sanitation facilities improvements in Bachcisaraj.

- f) Request USAID technical assistance for municipal utilities cost-recovery strategies.
 - e) Comply with Crimean/Ukrainian environmental regulatory requirements.
- 4) USAID Commitments:
- a) Purchase approximately 9,500 meters of 720 mm water pipe for Bachcisaraj water system.
 - b) Purchase and deliver water laboratory testing material and equipment for Bachcisaraj SES laboratory.
 - c) Provide financial assistance for completion of waste water treatment plant, and/or installation of sewer pipe, and/or home sanitation facilities improvements in Bachcisaraj.
 - d) Comply with U.S. environmental regulatory requirements.
- 5) The target completion date for all components of above project will be January 1, 1995.

APPENDIX D

GLOSSARY OF CRIMEAN ORGANIZATIONS

The State Committee on Water Resources (SCWR) - Crimean government organization that oversees water use for irrigation. In Simferopol:

Victor Lemeshev - Chairman; 27-6358
Peter Dudkov - Deputy Chairman; 27-7734
Anatolij Gkyan - Chief Engineer; 27-0492, 27-0108
Anatolij Sobolevsky - Head of Department of Water Resources; 24-5163

Hydrological Expedition - Crimean organization within SCWR that performs investigations related to irrigation water quantity and quality. Have mineral and biological testing laboratories and capability for developing monitor wells. In Simferopol:

Rezvikov Sergei Vladimirovich - Head; 27-0108

Ministry of Geology - Crimean government organization that performs subsurface exploration and development of hydrological, geophysical, and oil and gas resources. Has sole authority for potable water development of ground water. In Simferopol:

Vladimir Petrovich - Chief Hydrogeologist

Krim Vodokanal - The Crimean municipal government agency concerned with potable water distribution systems for cities and towns. Responsible for water treatment, disinfection and system maintenance. In Simferopol:

Edward L. Georgiev - General Director - (0652) 27-1053 telephone
(0652) 27-4945 fax
Nilidov Anatoli - Head, Bachcisaraj

Krim Vodstroy - An independent organization responsible for the majority of all major water works construction in Crimea since 1991. In Simferopol:

Boris Alexandravich - General Director, Simferopol
Vavidy Dimidrievich - Director in Charge of Bachcisaraj Project

Committee for Tatars - A Ukrainian government institution that functions to assist the repatriation of people deported from Crimea following World War II with branches in smaller communities. The Committee gives financial assistance as well as builds housing and supporting infrastructure in Crimea.

Lutvi Osmonov - Head - 25-8343, 25-3563 (fax) - Simferopol
(06554) 4-2579, (06554) 4-2761 (fax) - Bachcisaraj
Orlovski Alexi - Deputy Head Fefat Idirzitov - Head of Bachcisaraj Branch

Sanitary-Epidemiological Station (SES) - The component of the Ukrainian Ministry of Health concerned with environmental health and disease control. Has offices in most

Crimean cities and has laboratory quality testing and community level inspection/promotional capability.

Anatoli Litmivov, Chief Doctor for Bachcisaraj

Committee for Capital Building - A municipal level organization that plans and controls the construction of communities and supporting infrastructure. Includes seven labor groups for water line construction/home connections, sewerage, roads, electricity, and others.

Bekirov Izeet Seytumerovich - Bachcisaraj Contact - 4-0507, 4-3460 (fax)

APPENDIX E

SCHEDULE OF MEETINGS AND VISITS			
DATE	AGENCY	IN ATTENDANCE *	PHONE NUMBER**
July 25	State Committee for Water Resources (SCWR)	Victor Lemeshev - Chairman Peter Dudkov - Deputy Anatolij Gykan - Chief Engineer Anatolij Sobolevsky - Head, Dept. of Water Resources	27-6358 27-7734 27-0492, 27-0108 24-5163
July 25	Hydrologic Expedition	Reznikov Vladimirovich	27-0108, 48-3766
July 25	Symferopol Reservoir	Victor Lemeshev - Chairman SCWR	27-6358
July 26	KrimVodocanal (KV)	Edward Georgiev - General Director	27-1053, 27-4945 (fax)
July 26	Meshgournya Reservoir, Water Treatment Plant, and Testing Laboratory	Edward Georgiev - General Director, KV	27-1053, 27-4945 (fax)
July 27	State Committee for Tatars (SCT)	Orlovski Alexi - Deputy Head	25-8343, 25-3563 (fax) 4-2579 (Bachcisaraj) 4-2761 (fax, Bachcisaraj)
July 27	Ministry of Geology	Vladimir Petrovich	
July 27	KrimVodstroy	Boris Alexandrich - General Director	
July 28	City Hall, Bachcisaraj	Vavidy Dimidrievich - KV Mislink Alexandravich - Deputy Mayor	4-0507 (Bachcisaraj) 4-3460 (fax)
July 28	Tatar Community	Vavidy Dimidrievich - KV Mislink Alexandravich - Deputy Mayor	4-0507 (Bachcisaraj) 4-3460 (fax)
July 28	Bachcisaraj Water System	Vavidy Dimidrievich - KV Mislink Alexandravich - Deputy Mayor	4-0507 (Bachcisaraj) 4-3460 (fax)
July 29	City Hall, Bachcisaraj	Mislink Alexandravich - Deputy Mayor Refat Idirzitov - Head, Tatar Committee Ezid Situmemavich - Deputy, Tatar Committee Nilidov Anatoli - Director, VodaCanal Anatoli Litmivov - Chief Doctor	4-0507 (Bachcisaraj) 4-3460 4-2579 (Bachcisaraj) 4-2761 (fax, Bachcisaraj) 4-2579 (Bachcisaraj) 4-2761 (fax, Bachcisaraj)
July 29	SES Testing Lab, Bachcisaraj	Mislink Alexandravich - Deputy Mayor Tatiana Holvott - Head, Bacteriological Lab	4-0507 (Bachcisaraj) 4-3460 (fax)
July 29	Waste Water Treatment Plant	Mislink Alexandravich - Deputy Mayor	4-0507 (Bachcisaraj) 4-3460 (fax)

* - All meetings and visits were attended by Brad Carr, CH2M Hill consultant, and Janelle Daane, USAID representative.

** - All phone numbers are for Simferopol unless otherwise stated. Code prefix for Simferopol is 0652, and Bachcisaraj is 06554.

APPENDIX F

CURRENT CRIMEAN WATER QUALITY STANDARDS

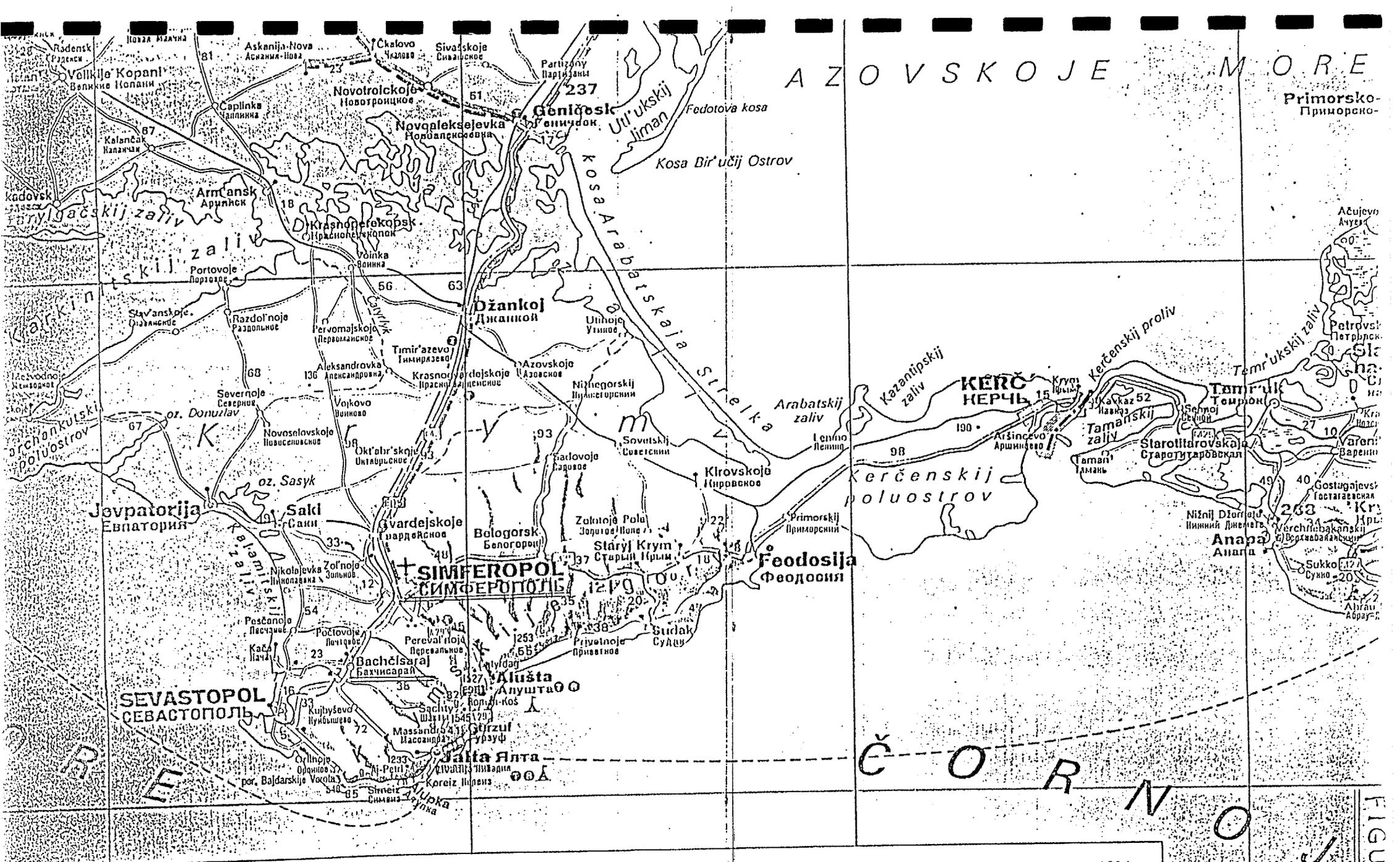
(taken from Hydrologic Expedition data)

	Irrigation	Meshgournya Reservoir	Units
Transparency			
Odor			
Color			
Suspended Solids			
CPAB			
HPK			
Mineralization (Sum of salts)	< 1200	< 1200	
pH	6.0 - 8.4	6.0 - 8.4	
CO3	< 6.0	6.0	mg/l
HCO3			
SO4	500	500	mg/l
Cl	350	350	mg/l
Ca	350		mg/l
Mg	100	100	mg/l
Na + K	230	230	mg/l
NO3	45	45	mg/l
NO2	3.3	3.3	mg/l
NH4	2.0	2.0	mg/l
BOD		6.0	mg/l
HPK		30.0	mg/l
SPAV		0.5	mg/l
Petroleum Products		0.05	mg/l
Pesticides			
DDT	0.1	0.1	mg/l
GHCG	0.02	0.02	mg/l
2.4D	0.2	0.2	mg/l
Nitrofen			
Cimazin			
Atrazin	0.5	0.5	mg/l
Prometrin	3.0	3.0	mg/l
Phazalon	0.001	0.001	mg/l
Rogor	0.03	0.03	mg/l
Methaphos	0.02	0.02	mg/l
Chlorophos	0.05	0.05	mg/l
DNOK	0.05	0.05	mg/l
Saturn	0.05		mg/l
Propanid	1.0		mg/l
Trephlan	1.0		mg/l
Radiology			
Beta Acitivity			10 -12 currie/kg
Stronzium 90	100	100	10 -12 currie/kg
Cezium 137	500	500	10 -12 currie/kg

	Irrigation	Meshgournya Reservoir	Unit
Heavy Metals			
W	0.05	0.05	mg/l
Pb	0.03	0.03	mg/l
Mo	0.25	0.25	mg/l
Cu	0.2	0.2	mg/l
Ni	0.1	0.1	mg/l
Co	0.05	0.05	mg/l
Cd	0.001	0.001	mg/l
Fe	5.0 (0.3)*	0.3	mg/l
Mn	0.2	0.2	mg/l
Cr	0.1	0.1	mg/l
Zn	1.0	1.0	mg/l
V	0.1	0.1	mg/l
As	0.05	0.005	mg/l

Note - 5.0 standard used for spray irrigation; 0.3 standard used for channel irrigation.

Light Metals			
Al	0.5	0.5	mg/l
Sr	7.0	7.0	mg/l
Be	0.0002	0.0002	mg/l
Li	0.03	0.03	mg/l
Metaloids			
B	2.0	2.0	mg/l
F	1.0	1.0	mg/l
P	1.0	1.0	mg/l

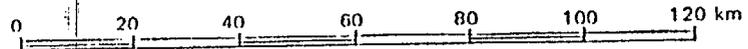


A Z O V S K O J E M O R E

Primorsko-
Приморско-

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1:2 000 000



— Vasútvonal
 Chemin de fer
 — Aerodrome
 Flugplatz
 — Filling station, autoservice

+ Repülőtér
 Aérodrôme
 Benzinkút, autószerelv

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FIGURE 1

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