water and sanitary waste water treatment for the city and surrounding villages. This department, with about 1,800 employees, provides services to residential, industrial, commercial and suburban customers with a varying water rate base or tariff. The system was designed so that industrial customers subsidized the other users to a great extent.

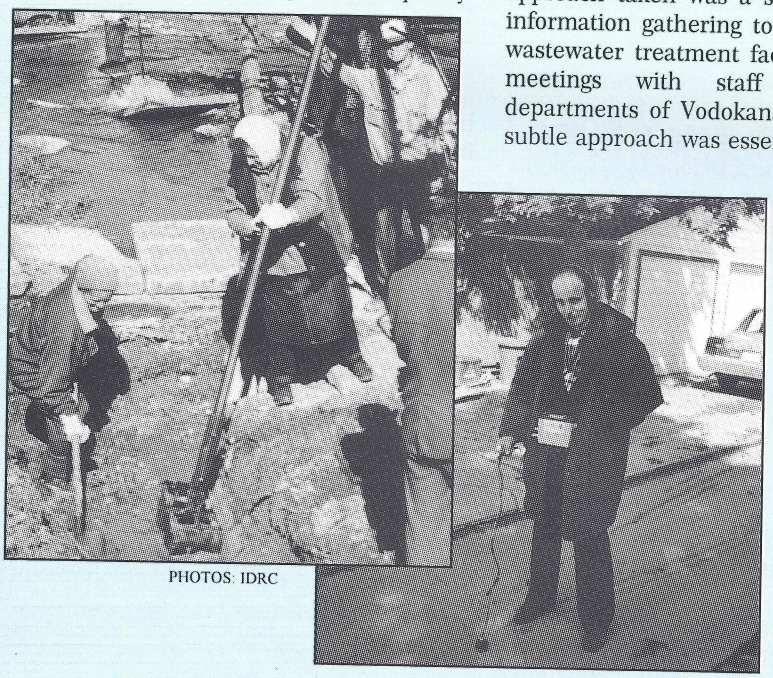
Zaporizhia's water-related problems originate from various sources. On the one hand, the city's drinking water source is contaminated from sources upstream: agricultural non-point source pollution (like fertilizers, pesticides washed into the river, erosion, etc.), industrial and municipal pollution. On the other hand, Zaporizhia itself adds to the problems of the Dnipro by treating its waste waters insufficiently and by letting part of its waste waters into the river without any treatment at all. Since the Dnipro empties into the Black Sea pollution entering the river will eventually end up in the world's oceans.

In the fall of 1994, Myron Lahola, head of the Rossdale Water Treatment Plant in Edmonton, undertook a two month training and needs assessment review of the Zaporizhia Vodokanal. The visit was arranged with the generous cooperation of the City of Edmonton which supported Mr. Lahola's participation and offered municipal water-related training programs in Edmonton. Mr. Lahola provided technical monitoring and support for a proposed sewer and tap water quality project which IDRC initiated in 1995. The approach taken was a series of informal information gathering tours at water and wastewater treatment facilities as well as meetings with staff from various departments of Vodokanal. Mr. Lahola's subtle approach was essential to develop a good rapport between Ukrainian and Canadian partners. With this approach, information was exchanged freely and sensitive issues were explored.

Water Quality, Costs and Services - Comparison of Water Supply in Edmonton and Zaporizhia (Fall, 1995)

City	EDMONTON	ZAPORIZHIA
Average daily water use	220 m^3/person	400 m^3/person
Residential water pressure	3-400 kPa	100 kPa
Water quality - colour TCU (True Colour Units)	1-2 TCU	8-10 TCU
Monthly water and sewage tariff†	$45	450,000 kbv* (~$2.80)
Water tariffs as % of total average income†	0.8-1	7-8
Operating cost recovery rate	100% + a return on investment	60%
% of population served by sewage treatment plant(s)	100	100
Total length of water pipes under the city	2,500 km	2,800 km
% of total sewage not receiving treatment	1.1	40-50
Annual number of water main breaks	750	2,000-2,500
Average repair time of a water main break	1-3 days	6-7 days

*† for a family of four; * karbovanets*



PHOTOS: IDRC

Trying to replace manual labour with modern technology.

IMPROVING WATER SUPPLY IN ZAPORIZHIA

Based on information collected during the needs assessment, Vodokanal formulated a strategy and a series of projects were started. Mr. Lahola continues to manage the activities in Ukraine as a volunteer, supported financially and scientifically by IDRC. The City of Edmonton also assists the EMDU Program. The Sewer and Tap Water Quality project attacks the problem of drinking water quality which the Ukrainian Academy of Science had considered to be sub-standard for various reasons, such as the presence of polluted waters in the city's reservoir; over-chlorination; and corrosion and bacteria in the distribution pipes. The project investigates background contamination coming from acid rain, storm runoff, and industrial and municipal wastes. Based on chemical and biological analyses of water samples, preliminary reports from Ukrainian and Canadian experts include some startling new evidence.