

SUMMARY AND WORK PLAN
FOR SLOVAKIA MUNICIPAL WASTEWATER PROJECTS
December 3 - 15, 1995 Site Visits

THE ENVIRONMENTAL ACTION PROGRAMME
SUPPORT PROJECT
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EXECUTIVE SUMMARY

This report summarizes information collected by Dames & Moore in December 1995 as part of a visit to pre-selected municipal wastewater treatment, collection, and conveyance projects throughout Slovakia. The U.S. Agency for International Development (USAID) provides grant funding for environmental-related projects in Slovakia through the Environmental Action Program Support (EAPS) project. A total of 10 potential projects were identified for the EAPS project by Dr. Theodore Smith, Senior Environmental Finance Advisor (SEFA), and a local Slovakian wastewater engineering expert, Mr. Fedor Rippa. Nine of the ten project sites were visited as part of the in-country work. One project location, Liesek, was not visited due to time constraints and available information, which suggested the project may not be suitable for funding in the current year.

The municipal entities involved in the review effort had previously provided project-related information and a funding request to the Slovak Ministry of Environment. This information was translated and reviewed before visiting specific project locations. In each case, a project representative from each municipality was interviewed on-site to obtain additional relevant details of the project status and funding request. The interview process was used to clarify the previously supplied project information. Evaluation criteria were established to objectively analyze each project, including expected environmental benefits, public health impacts, the use of Slovak or American materials in the project, and funding requests relative to funds available. These criteria were used to determine whether further consideration of a project was warranted.

Each of the projects visited are described individually in this report. Based on the information compiled for each project, and using the evaluation criteria, four of the ten projects were recommended to USAID for further consideration. These projects include improvements to wastewater collection systems or existing wastewater treatment facilities in the villages of Danišovce, Kamienska, Lutilla, and Šurany. A project profile form was completed for each of these four projects to further assist in the funding selection process.

This report is organized into three sections. Section I introduces the scope and purpose of the Slovakia mission for evaluating proposed new construction or modifications to pre-selected municipal wastewater projects. Section II presents detailed information obtained as part of the in-country project site visits for the pre-selected mission sites, the evaluation of each project, and recommendations on whether the project is retained for further consideration. Finally, Section III discusses additional work required for final evaluation of the retained projects to select the project or projects for funding during the current year. Completed project profile forms are included in Annex A.

SECTION I INTRODUCTION

This report describes results of an in-country site visit to nine municipal wastewater treatment projects located throughout Slovakia. These nine projects were evaluated for USAID funding selection under the EAPS program. The project purpose, methodology, and report organization are described in this section.

A. Purpose

USAID provides funding for various types of environmentally-related projects in Slovakia through the EAPS program. A portion of the funds have been designated for municipal wastewater collection, conveyance, and treatment projects. To determine which project or projects are eligible for USAID funding, a systematic and objective analysis of pre-selected projects was required. The wastewater projects reviewed involved a wide range of proposed construction efforts, from sewage collection systems to equipment installation at existing wastewater treatment facilities and complete construction of new wastewater treatment facilities. Analysis was completed by performing an in-country visit to the project locations to compile detailed information on each project.

B. Methodology

The Slovakia Senior Environmental Finance Advisor (SEFA), Dr. Theodore Smith, and a local Slovakian wastewater engineering expert, Mr. Fedor Rippa obtained a comprehensive listing of municipal wastewater projects for which funding had been requested through the Ministry of Environment. These funding requests were made by municipalities from throughout the country. From the comprehensive list of projects, a total of 10 projects were identified for USAID funding consideration.

Information provided by the municipality was translated and reviewed prior to the site visits. Formal meetings were arranged with municipal representatives to collect more detailed information on each project, and to inspect existing facilities, where applicable. These meetings were held with the mayors of each village, with the exception of Bardeřov and Lutilla. In these two cases the operations managers for the facilities were interviewed. Supplemental information was obtained in the interviews to clarify the data made available prior to the visit.

Project-specific information from all sources was compiled and analyzed using evaluation criteria. These included expected environmental benefits of implementing a project; public health impacts; the use of Slovak or American equipment and materials in the project; and funding requests relative to funds available during the current year. Using this process, five of the nine project sites visited were rejected for further consideration. The four remaining projects were retained, and project-specific profile forms were prepared. These project profile forms are intended to summarize relevant information regarding the project, and assist in the final evaluation of these projects for funding selection. A brief description of work needed to complete the review process for the four retained projects was prepared to assist in developing a work plan to complete the final evaluation.

SECTION II PROJECT DESCRIPTION AND RECOMMENDATIONS

This section provides detailed project-specific information and recommendations regarding whether a project should be retained for further consideration.

A. Project Descriptions

This section includes the following information on each of the projects:

- Project location and demographics
- Project analysis, including project description, status, and financial details
- Recommendations, including supporting arguments

Nine project site locations were visited in December 1995. The Liesek project site was not visited since, based on information obtained through the Minister of Environment, the project is not a likely candidate for funding this year. Projects not selected for further consideration for funding in the current year should be retained for consideration in the future. The nine project sites visited were:

- Bardeov
- Danišovce
- Hodruša Hámre
- Kamienka
- Lutilla
- Šarišske Michalany
- Šurany
- Veľké Úľany
- Vinosady

Information obtained at each project location is given in the following subsections. Table II-1 summarizes relevant project-specific information. This information has been incorporated into the individual project profiles included in Annex A.

A1. Bardeov

Project location and demographics. Bardeov is a town of approximately 62,000 located in a popular spa region in eastern Slovakia. The Topľa river, which passes through the town, has been impacted by municipal and industrial wastewater discharges.

Project analysis. Domestic sanitary and industrial wastewater from Bardeov exceeds the design biological treatment capacity of 72 liters per second (lps) at the existing plant. Current influent flow rates are approximately 140 lps. Influent is directed through the plant such that all inflow passes through the primary settling basin, and is then split to direct discharge or to the secondary treatment process. Thus, only 50 percent of the total influent receives secondary treatment; the remaining 50 percent of the influent receives only primary treatment.

Table II-1
Summary Information on Slovakia Wastewater Infrastructure Improvements

Project Name	Existing Facilities	Proposed Project	Design Status	Populatio	Funds Requested, Sk
Bardešov	12,525 m ³ /d wastewater plant; sewage collection system	Upgrades to existing plant to increase capacity	Plant upgrade design complete	62,000	22,000,000 (733,300)
Danišovce	Partially completed wastewater plant and sewage collection system	Procurement and installation of treatment plant equipment and sewage connection main construction	Plant and sewage line design complete	350-400	632,500 (21,100)
Hodruša Hámre	400 meters of sewage main from proposed treatment plant location to village	Construction of additional 2,300 meters of sewage collection system	Sewage collection system design complete; conceptual design for wastewater plant	1,350	7,000,000 (233,300)
Kamienka	Common wastewater plant with adjacent village; partial sewage collection system	Construction of 1.6 kilometers of sewage main to connect Kamienka to wastewater plant	Sewage connection design complete	550	3,000,000 (100,000)
Lutila	Sewage main from Lutila to Ďiar nad Hronom.	Construction of sewage collection system in village and connection to main at Ďiar nad Hronom	Sewage collection system design complete	1,180	7,600,000 (253,000)

Šarišské Michalany	Wastewater treatment facility; partial sewage collection system	Upgrades to existing treatment plant to increase capacity	Design of treatment plant upgrades complete	1,000	8,000,000 (266,700)
Šurany	Wastewater treatment facility; partial sewage collection system	Construction of a sewage collection line to add more residents to existing plant	Design of collection line complete	450	5,450,000 (181,700)
Veľký Ul'ány	Partially completed wastewater facility remaining from agricultural cooperative	Procurement and installation of treatment plant equipment to accept septic tank wastes	Conceptual design of equipment retrofit complete	4,200	7,824,000 (260,800)
Vinosady	Partially completed wastewater facility	Procurement and installation of treatment plant equipment and construction of lift station to plant	Equipment installation and lift station design complete; no design for sewage collection system	1,100	4,000,000 (133,300)

The primary and secondary treated effluent is mixed prior to discharge to the Topľa river, resulting in a BOD concentration of approximately 80 mg/l. The wastewater utility in turn pays fees to the regional Topľa river water management company for each kilogram of BOD exceeding a specified limit. These fees total approximately Sk 2,500,000 per year. The utility has also received notice from the Ministry of Environment that, after the year 2004, fines will begin to be assessed for exceeding the BOD regulatory limits.

In an effort to expand treatment capacity, the utility is using internal funds and available funds from the State Environmental Fund (SEF). Plant design modifications were developed by Ťov-Spol of Prešov. A total of Sk 2,000,000 was expended in 1994 to procure a new sludge filter press, which is currently being installed in a new sludge management building. The new sludge filter press was manufactured in the Czech Republic. A total of Sk 5,000,000 was being used in 1995 to initiate construction of new aeration tanks. The estimate received from Ťov-Spol for all plant modifications totaled Sk 29,000,000. Given the funds expended through 1995, a shortfall of Sk 22,000,000 exists to complete the remaining modifications of increased aeration, clarification, and sludge stabilization capacity. Proposed plant modifications are straightforward and will likely allow the utility to meet regulatory discharge limits to the Topľa river.

Recommendation. No further consideration of this project is recommended at this time. The proposed improvements meet the criteria of significantly reducing organic loading to the Topľa river, improving environmental conditions for human health, and can probably be completed using Slovak or American equipment. However, the financial requirements of Sk 22,000,000 exceed USAID funding limits for the current year.

Plant modifications to meet future treatment requirements for the higher influent flow rates have been designed, and some construction work has been initiated. For this reason, and since fees are being assessed to the wastewater utility for excessive BOD loading to the Topľa river, future assistance to obtain funding for the proposed design modifications may be warranted.

A2. Danišovce

Project location and demographics. Danišovce is a village of approximately 400 people located near Spišská Nová Ves in eastern Slovakia. Municipal sanitary wastewater is discharged to the Odorica stream directly from a partially completed sewage collection system, and ground water has been impacted by individual residential septic systems.

Project analysis. The proposed project in Danišovce will procure and install equipment in a partially completed wastewater treatment plant. The population of Danišovce ranges from 350 to 400 people and currently uses individual septic systems for wastewater treatment. This has resulted in noticeable negative aesthetic impacts to the local stream, especially during warmer months. The village has constructed sewer lines from seven community buildings to within 100 meters of the partially completed treatment plant location. Under current conditions, wastewater from these community buildings flows untreated to the local stream.

The existing sewage collection system for the seven community buildings represents approximately 30 percent of the full sewage collection system design. The flows from the community buildings would

represent roughly 25 percent of the total design flows to the treatment plant. Thus, until a sewage collection system is completed for the entire village, only that portion of the equipment needed to treat the less-than-design flow conditions would be required at this time.

The plant design was completed by Projektová Kancelária of nearby Spišská Nová Ves. According to information provided by the mayor, the design includes Slovakian equipment. The plant is a typical secondary treatment system, including primary sedimentation, aeration, clarification, and sand drying beds for sludge dewatering. The village has purchased some plant equipment (e.g., pumps) totaling Sk 350,000 to date, although none of this equipment has been installed. Projektová Kancelária has estimated that procuring and installing an air compressor, sludge holding tank, sludge transfer pumps, influent flow meter, and sludge drying beds, for the entire plant capacity will cost Sk 700,000. The connection lines for the existing sewage collection system to the plant (375 meters) will cost Sk 825,000. However, only 100 meters of the 375 meters of connection line is essential at this time. Resulting flow rates to the plant would also only require a portion of the treatment equipment to be installed at this time. The contractor has thus estimated that Sk 632,500 would be sufficient to complete installation of the necessary equipment at the plant, and for the 100 meter main connection at this time. Danišovce has completed a design for the remaining sewage collection system within the village. The village will continue to add sections to the system as local and SEF funds become available, along with the remaining treatment plant equipment to meet capacity requirements for the higher flow rates.

Recommendation. Further consideration of this project for funding is recommended. Danišovce has initiated a sound approach to date, which includes a design to complete the sewage collection system. Connection of seven community buildings representing 25 percent of the full design flow to the plant will mitigate significant impacts to the local stream and improve human health and aesthetic conditions in the village. Further clarification regarding the origin of the proposed treatment plant equipment is needed to ensure Slovak equipment can be obtained, as has been indicated by the village. The funding request of Sk 632,500 is within USAID funding limits.

A3. Hodruša Hámre

Project location and demographics. Hodruša Hámre is a village of approximately 1,500 located in a central Slovakian mining district. Direct discharge of sanitary wastewater through an historic mining shaft has impacted the Hron river, a major waterway in the region. The local Hondrušianka stream has been impacted from individual residential septic tank discharge.

Project analysis. Hodruša Hámre is situated in a narrow mountain valley. The current practice of direct discharge of septic wastes collected from individual homes and apartment complexes to the mining shaft, and thus the Hron River, as well as from breached individual septic tanks to the local stream and groundwater result in human health and aesthetic impacts. Complaints have been received from the Mining Ministry that this practice impedes their ability to properly perform routine inspections of the shaft. Furthermore, evidence of surface subsidence around the shaft entrance exists. The villagers are concerned this shaft may collapse.

The town has begun construction of approximately 400 m of a sewage collection system this year at a cost of Sk 2,500,000. This represents a unit cost of Sk 6,750 per meter. The remainder of the collection system has been designed, and will be constructed as funds are available. Funds totaling Sk 7,000,000 are

requested to complete an additional 2,300 meters of sewer line, with a unit cost of approximately Sk 3,000 per meter. A portion of the village with approximately 150 residents lies topographically below the proposed location of a new wastewater treatment plant; this area will not be connected to the planned sewage collection system in the future, and will continue to be serviced by septic tank pumping trucks.

Tenders for construction of a new wastewater treatment facility were received, and the firm Combin of Banská Štiavnica was selected by Hodruša Hámre to build the facility. Hydrotech, a.s. of Bratislava will provide the detailed plant design and supply the equipment. Although the mayor did not have manufacturing details of the proposed equipment for this facility, the design approach would likely include equipment from non-Slovak or Czech European countries. The village owns the land for the proposed treatment plant, and also has obtained the necessary building permit. Hodruša Hámre is also soliciting funds from SEF for construction of the proposed wastewater treatment plant.

Recommendation. No further consideration is recommended at this time. Hodruša Hámre initiated the design of a sewage collection system and has begun construction of a portion of that system. However, funds are not available for construction of the treatment plant, which will be required to have positive impacts to both human health and aesthetic conditions to the Hron river and local stream. Completion of the sewage collection system in the absence of a treatment plant would continue the direct discharge of untreated sanitary wastewater to the local streams. The proposed treatment plant design, while not part of the requested funds at this time, would be expected to achieve effective wastewater treatment. However, the proposed process is over-designed for current BOD and TSS discharge regulations, is more costly than other secondary treatment designs, and would not use Slovak or American equipment. Finally, funds requested to complete the proposed sewage collection system and the treatment plant are approximately Sk 18,000,000, exceeding USAID limits for the current year.

A4. Kamienska

Project location and demographics. Kamienska is a village of approximately 550 people located in eastern Slovakia. Individual residential septic systems that have been breached have adversely impact the local Kamienska stream.

Project analysis. Domestic sanitary wastewater from the 530 residents of Kamienska is directed to individual septic systems. As with other communities visited as part of this mission, insufficient treatment is achieved with these individual septic systems, causing significant impacts to the local stream. A secondary municipal wastewater treatment plant to serve both Kamienska and nearby Kamenica nad Cirochou was designed and constructed in Kamenica nad Cirochou by Ecofluid of Bratislava. The plant was commissioned in May 1995. Kamenica nad Cirochou is located topographically below Kamienska, and wastewater will flow by gravity from Kamienska. However, the sewage main between the two communities has not yet been completed. As a result, the new wastewater facility is currently operating at approximately 50 percent of its design capacity, and since only 70 percent of Kamenica nad Cirochou residents are connected to their existing sewage collection system.

Funds (Sk 3,000,000) have been requested by Kamienska to complete 1,600 meters of 300 mm PVC gravity flow pipe between Kamienska and Kamenica nad Cirochou. This represents a unit cost of Sk 1,875 per meter. Construction is expected to be relatively straightforward, with minimal difficulties anticipated along

the proposed alignment. Kamienka has connected 60 percent of its residents to a sewage collection system. Therefore, completion of the proposed connection would add 300 to 350 people to the new treatment facility. The connection is sized to accommodate all residents of Kamienka as the sewage collection system is completed. Slovakian construction materials are available to complete this proposed connection.

Recommendation. Further consideration of this project for possible funding is recommended. The project is a straightforward connection of a partially completed sewage collection system from Kamienka to the common secondary wastewater plant in Kamenica nad Cirochou. Completion of the project will have immediate positive human health and aesthetic impacts on the local stream. All design work has been completed, and the unit costs for the proposed connection appear to be appropriate. These costs were estimated by the two villages based on recent construction costs for other parts of the sewage collection system.

A5. Lutila

Project location and demographics. Lutila is a village of approximately 1,180 people adjacent to Ďiar nad Hronom in central Slovakia. Individual residential septic systems have created both human health and aesthetic impacts to the local Kopernický stream.

Project analysis. Under current conditions domestic sanitary wastewater from individual septic systems impacts the local stream, with significant aesthetic problems in warmer months. A newly constructed wastewater treatment plant in nearby Ďiar nad Hronom was designed to accommodate all future domestic wastewater from Lutila. Design maximum flow rates from Lutila to the plant in Ďiar nad Hronom total 318 m³/day. Storm water will be collected separately from sanitary wastewater, and will be directed to the local stream. A storm water diversion structure is also included as part of the proposed project. The wastewater treatment plant in Ďiar nad Hronom is currently operating at approximately 50 percent of full capacity. As a separate project, Ďiar nad Hronom is working to complete the sewage collection system within their town limits.

The proposed Lutila project involves two phases: (1) construction of 1,815 meters of 400 mm PVC pipe from Ďiar nad Hronom to the edge of the village; and, (2) construction of approximately 1,865 meters of a gravity flow sewage collection system throughout the village. Newly constructed homes within Lutila are provided with sewer taps to a stub location alongside streets. Wastewater from new homes in Lutila will not be treated until the connection to Ďiar nad Hronom is complete. Completion of both phases will accommodate 1,180 people in Lutila, and a projected population of 2,000 by the year 2030.

Phase I was completed in 1995. The connection piping installed as part of Phase I was Slovakian. The remaining collection system for Phase II would also be constructed with Slovakian materials. Funding is requested for all or part of Phase II, which is estimated at Sk 14,000,000. This includes a storm water collection pipe and overflow structure. The portion of the total amount needed for the storm water diversion system was not available at the time of the site visit, but has been requested from the village. The village has approximately Sk 3,200,000 for 1996, and is working to obtain SEF matching funds of the same amount, leaving approximately Sk 7,600,000 to complete the entire proposed Phase II project. The Phase II cost estimate was developed by the contractor selected for Phase I work. This contractor was selected as part of a competitive bidding process conducted by Lutila, and was selected based on client references and

responsiveness, rather than low cost. The village wishes to complete the Phase II collection system construction as designed, but will pursue construction in smaller increments, if necessary, as funds become available.

Phase I costs were Sk 3,050,000, or Sk 1,680 per meter. Higher costs expected for Phase II are due to the complexity of the collection network, including installation of additional manholes, flow meters, and construction along village roadways adjacent to electrical utilities. A detailed evaluation of the Phase II estimate should be completed to confirm this higher unit price.

Recommendations. Further consideration of this project for funding is recommended. Lutila has taken appropriate measures to provide for its wastewater treatment at the new Ďiar nad Hronom plant, and by completing design of the sewage collection system in a phased approach. Impacts to the local stream would be mitigated with completion of the collection system, and the project can be completed with Slovakian construction materials. A review of the cost estimate for Phase II activities is essential to confirm the estimated unit price supplied by the contractor, and to determine what portion of the requested funds are needed for the storm water diversion system. This will ensure the financing request could be met by available USAID funds.

A6. Šarišske Michajany

Project location and demographics. Šarišske Michajany is a community of 2,600 located in eastern Slovakia. Human health and aesthetic impacts to the local Torysa stream have occurred due to the portion of the community not currently connected to the existing wastewater treatment system.

Project analysis. Šarišske Michajany directs domestic sanitary wastewater from approximately 60 percent of its population to a wastewater treatment plant owned and operated by Imuna, a local pharmaceutical manufacturer. The village wishes to complete construction of a sewage collection system to accommodate wastewater treatment for the remaining 40 percent of the residents. However, completion of this sewage collection system is predicated upon expanding the existing plant to allow for the needed additional capacity. This capacity is required for the village as well as for future expansion of the Imuna facility. Wastewater discharge from homes not currently connected to the treatment plant have not impacted the local ground-water drinking water supply, although the village does perform routine monitoring of the local drinking water source to ensure protection of human health.

Proposed modifications to the wastewater plant include additional aeration and clarification capacity, and a new sludge filter press system to replace the existing sand drying beds. Plant design modifications were developed by the firm EcoProgress of Bratislava. These modifications include non-Slovak and non-American equipment. Šarišske Michajany is requesting Sk 8,000,000 to Sk 8,500,000 to complete treatment plant modifications.

Recommendation. No further consideration of this project is recommended at this time. Šarišske Michajany has developed a sound approach to modify the Imuna plant to allow for completion of the village's sewage collections system. This would have positive impacts on the local stream to improve human health and aesthetic conditions. However, funds requested to modify the plant involve non-Slovak and non-

American equipment. Furthermore, the relationship between the village and Imuna is not clear, and may be impacted by certain political connections.

A7. Šurany

Project location and demographics. Šurany is a town of approximately 10,000 people located in an archaeologically unique region of western Slovakia. Certain portions of the town are not connected to an existing sewage collection and wastewater treatment system. Individual residential septic systems had adversely impacted ground water and lakes in the region.

Project analysis. An existing secondary wastewater treatment plant in Saran is currently operating below its design capacity. The proposed project of constructing an extension to the existing sewage collection system would add approximately 450 residents to the 7,600 currently served by the plant. Negative aesthetic impacts to the local stream and nearby lakes are evident, especially in warmer months. The local stream has low flow velocities, further contributing to human health and aesthetic problems. The groundwater level in the region is close to the surface, causing direct impacts on the local aquifer from individual septic systems.

There are six other villages in proximity to Šurany. The town is developing long-term plans to increase aeration and sedimentation capabilities at the plant, and will complete the sewage collection system in Šurany and in the surrounding villages for connection to the existing plant. However, this effort is not part of the current proposed project. Design of the proposed connection line is complete and includes installation of various pipe sizes along a total length of 1,480 meters. The cost estimate provided by Šurany for this connection is Sk 5,450,000, or approximately Sk 3,680 per meter. The unit price for construction reflects installation of a portion of the line beneath railroad tracks. Slovakian materials of construction could be used to construct the proposed connection line.

Recommendation. Further consideration for funding this project is recommended. Installation of the proposed sewage collection line is relatively straightforward, although slightly complicated by installing a portion of the line beneath an active railroad line. Although requested funds are within USAID limits for the current year, this complication results in somewhat higher unit costs of construction. The town has a sound design and long-term plans to complete the sewage system in Šurany and neighboring villages that have no access to sanitary wastewater treatment. The project could be completed using Slovakian construction materials, and would have direct positive impacts to groundwater. A review of the cost estimating procedure should be made to evaluate how the unit costs for construction were obtained.

A8. Veľký Ul'ány

Project location and demographics. Veľký Ul'ány is a village of approximately 4,200 people located in western Slovakia. Impacts to human health have been observed due to breaches in individual residential septic systems and their effect on municipal drinking water supply wells in the area.

Project analysis. Veľký Ul'ány is concerned about possible impacts to the shallow aquifer since the area contains five drinking water supply wells that serve the town and the nearby towns of Galanta, Nitra, and Nove Zamky. No sewage collection system exists within the village. The village purchased an existing,

uncompleted wastewater treatment system originally constructed by a local pig farm cooperative. After the cooperative ceased operation in 1993, the partially completed treatment plant was abandoned.

The proposed project would specify wastewater equipment, including baffles and weirs, within one of the three steel tanks to provide for primary sedimentation, aeration, and clarification. The uncompleted facility was purchased by the village since distance and available capacity prevent Vel'ke Ul'any from connecting to other nearby wastewater treatment plants. Design details related to the proposed retrofit design for one of the available tanks were not available during the site visit. Equipment proposed for the retrofitting is not Slovak or American. In addition, wastewater would need to be delivered to the plant from individual residences using septic pumping trucks, until a sewage collection system could be designed and constructed.

Recommendations. No further consideration is recommended for this project at this time. Veľké Ul'any has purchased existing structures from a partially completed wastewater facility, which require retrofitting to achieve treatment requirements. While the need for a wastewater treatment plant is significant, given the proximity of the village to drinking water supply wells, the lack of a sewage collection system will result in continuing negative impacts to the shallow aquifer. A more detailed review of the proposed design modifications, with examples of operating data at similar installations, and a determination if Slovak or American equipment could be supplied for the project, would be useful in evaluating the potential for the design to meet intended treatment goals.

A9. Vinosady

Project location and demographics. Vinosady is a village of approximately 1,100 people located in western Slovakia, near Bratislava. Significant human health and aesthetic impacts to the Sisek stream and the shallow groundwater have been observed from breached residential septic systems.

Project analysis. Domestic sanitary wastewater in Vinosady is directed to individual septic tanks. No sewage collection system exists in the community. Discharge from the septic tanks reaches the shallow groundwater in the area and, in some cases, the local stream. Problems with breached septic tanks minimizes the frequency of pumping the tanks. Due to the nature of the problems, the village completed design of a wastewater treatment system and initiated construction of the civil features of the plant.

Construction completed in 1993 included the control room, headworks, reactor tanks, and sludge handling facilities. This work was completed with proceeds from the sale of some community land. Plant design represents a typical secondary treatment design, with additional capabilities for tertiary treatment, including nitrification, denitrification, and potentially some biological phosphorous removal. Hydrotech, a.s. of Bratislava provided the wastewater plant design to the village. An agreement exists between Hydrotech and Vinosady to complete the project. This involves procuring and installing treatment plant equipment within the existing structure, including but not limited to pumps, blowers, baffles, weirs, sludge handling system, and electrical and mechanical control systems. Based on conversations with a Hydrotech representative, the equipment would be procured from European countries other than Slovakia. In addition to the plant equipment, a sewage lift station and force main connection to the plant is required. The force main piping has been purchased by the community, but has not been installed.

Since no sewage collection system exists within the village, plans are to construct this system over a period of several years using locally available municipal funds and matching funds from the SEF. Vinosady has not completed design of the sewage collection system. Before construction of the collection system is initiated, the village proposes to haul wastewater and septic solids from individual homes via pumping truck to the lift station until the collection system can be constructed. The proposed method of operation will require the plant to run intermittently; however, the exact approach for plant operation in this interim period is not known.

Recommendations. No further consideration is recommended at this time. While the rationale for initiating the project was valid for this community, the lack of a sewage collection system and design plans for this collection system pose a significant problem for plant operation. In addition, the proposed plant design does not specify Slovak or American equipment. Further information would be needed to determine if acceptable equipment is available that could be installed into the existing plant building.

B. Recommendation Summary

Table II-2, on the following page, summarizes the information for each project, and can be used as a quick reference.

**Table II-2
Summary Recommendations on Slovakia Wastewater Infrastructure Improvements**

Project Name	Environmental Benefits	Public Health Impacts	Equipment Origin	Retain for Consideration
Bardeřov	Moderate aesthetic improvements by reducing primary treated sanitary wastewater to large Topľa watershed	Moderate reduction of pathogenic organisms introduced to watershed in important spa region	Slovakian possible	No
Daniřovce	Significant aesthetic improvements by controlling direct discharge of wastewater to local stream	Significant reduction of pathogenic organisms to local stream	Slovakian possible	Yes
Hodruřa Hámre	Moderate aesthetic improvements to Hron River watershed by terminating discharge to mine shaft	Moderate reduction of pathogenic organisms introduced to watershed	German, French, Italian	No
Kamienka	Significant aesthetic improvements by controlling direct discharge of wastewater to local stream	Significant reduction of pathogenic organisms to local stream	Slovakian	Yes
Lutila	Moderate to significant aesthetic improvements by controlling direct discharge of wastewater to local stream	Moderate to significant reduction of pathogenic organisms to local stream	Slovakian	Yes
řariřske Michapany	Moderate aesthetic improvements by controlling direct discharge of wastewater to local stream	Moderate reduction of pathogenic organisms to local stream	German, French	No
řurany	Moderate to significant aesthetic improvements by controlling direct discharge of wastewater to local stream and shallow groundwater	Moderate to significant reduction of pathogenic organisms to local stream and groundwater, and in nearby lakes used for recreation	Slovakian	Yes
Veľká Ul'ány	Moderate to significant aesthetic improvements by controlling direct discharge of wastewater to local stream and nearby ground water drinking wells	Moderate to significant reduction of pathogenic organisms to local stream and groundwater used for municipal drinking water supply	German, French	No
Vinosady	Significant aesthetic improvements by controlling direct discharge of wastewater to local stream	Significant reduction of pathogenic organisms to local stream	German, French, Italian	No

SECTION III

ADDITIONAL ANALYSIS FOR RECOMMENDED PROJECTS

Information obtained during the in-country site visits in December 1995 indicate an additional data review will be needed to fully evaluate the four recommended projects to finalize funding selection. This data review includes:

- **Reviewing available design information from the municipalities.** This includes detailed analysis of engineering designs prepared for the specific project and comparing with descriptions provided previously and with information obtained in the interview. This will be performed on-site to the maximum extent practical; copies of critical documents will be made for subsequent office analysis, if necessary.
- **Reviewing as-built drawings of existing facilities at each project location, where applicable.** This will be used to ensure that installation of proposed project components is compatible with existing structures. Again, this will be performed on-site, with subsequent office analysis.
- **Reviewing availability of Slovakian or American materials and equipment to complete the project.** This will include examining information provided by vendors and comparing to the proposed design. This information can be obtained during an on-site visit and be completed with a subsequent office analysis.
- **Performing budgetary engineering cost estimates using the available design information, and comparing with estimates provided by the project sponsor.** This will involve compiling equipment and material lists for the proposed work, and construction activities needed to complete installation of the project components.

The proposed team for these follow-up activities would be an expatriate wastewater engineer and a procurement specialist (K&M Engineering), accompanied by (a) local engineer(s). The team should be able to complete the data review described above in two weeks, visiting each site one day and spending the remaining time preparing the bid packages for the selected project sites. Construction bid packages would be released to local vendors while the team is in-country.

EAPS PROJECT INFORMATION FORM SLOVAKIA WASTEWATER INFRASTRUCTURE IMPROVEMENTS

EAPS Project Code

Project Title (one sentence defining the project scope)

Danišovce village proposes to install a portion of the equipment required in a partially completed wastewater treatment plant to treat a portion of wastewater flows generated from community buildings, and to install a short connection line from an existing sewage collection system to the plant site.

Project Promoter Information

Name/Location	Village of Danišovce, Eastern Slovakia
Address	Obecný úrad, Danišovce 05322 Odorin, Slovakia
Tel.	42-965-26656
Fax	None
Primary Contact	Village Mayor
Additional Contacts	None
Legal status of the proponent	Incorporated municipality.
Other contributors/sponsors	None
Roles/Contributions of other sponsors	None

PROJECT INFORMATION

Short description of project

A secondary municipal wastewater treatment plant has been designed, and a portion of the facility has been constructed. The current population of 350 to 400 people currently use septic systems for residential wastewater treatment. However, the village has constructed sewer lines from seven community buildings to within 100 meters of the unfinished plant location. Under current conditions, untreated wastewater from these community buildings flows to the local stream.

The existing sewage collection system represents approximately 30% of the full collection system design. Wastewater flow rates from the seven community buildings represent approximately 25% of the total design flows to the treatment plant. Thus, only that portion of the equipment needed for full-scale design flow conditions would be required at this time, along with the critical 100 meter sewage line connecting the community buildings to the plant location.

Project purpose

To procure and install necessary treatment plant equipment at the existing treatment facility, including an air compressor, a sludge holding tank, sludge transfer pumps, an influent flow meter, and sludge drying beds. Procure and install at least 100 meters of sewage line from community buildings to existing plant.

Expected environmental benefits	Eliminate direct discharge of sewage from community buildings to the local stream. Village experiences noticeable aesthetic problems during warmer months. Mitigate human health concerns related to direct contact with the local surface water.	
Impacted population	Current 350 to 400 residents positively impacted by minimizing aesthetic problems. New residents from Spišská Nová Ves also positively impacted.	
Ambient surface water and/or ground water conditions before and after project implementation		
Pollutant	Estimated Effluent Baseline Conditions (kg/d)	Estimated Effluent Conditions at Project Completion (kg/d)
BOD ₅	22	1.2
TSS	20	1.1

Relevant Environmental Standards (existing and proposed)

Current: BOD₅ = 60 mg/L, TSS = 55 mg/L

Proposed: BOD₅ = 50 mg/L, TSS = 40 mg/L

Project Status (describe activities and outputs completed to date)

Danišovce has completed construction of primary sedimentation and aeration tanks, the control building with electrical connections and controls, and sewage collection lines from seven community buildings to within 100 meters of the plant location.

Implementation schedule

Activity	Time Frame to complete	Start	Completion
Project preparation and design	-	-	Proposed design complete
Resolve remaining technical issues*	up to 4 weeks	Week 1	TBD
Tenders and procurement	6 - 8 weeks	Week 2 - 5	TBD
Construction	8 weeks	Week 8 - 13	TBD
Start-up and training	2-4 weeks	Week 16 - 21	TBD
Operation	On-going	-	-

Activities critical for preparation/construction period: Review existing as-built drawings for treatment facility, and sewage collection system from community buildings. Review available design information and proposed equipment lists. Information will be used to develop the construction bid package.

* Schedule of activities to resolve remaining technical issues:
(Wastewater team consists of expatriate wastewater engineer and a local engineer)

Action	Output	Date	Responsibility/LOE
Review existing as-built drawings	Determine details of work completed to date	TBD	Wastewater team - 2 days in-country; 2 days office
Review available design information	Determine details of design activities completed to date	TBD	Wastewater team - 1 day in-country; 1.5 days office

Evaluate availability of local equipment or materials to complete proposed work	Determine whether Slovakia manufactures equipment required for installation at existing plant.	TBD	Wastewater team - 1 day in-country; 2 days office
Prepare construction bid package	Bid package for submittal to qualified construction firms	TBD	K&M Engineering - 1 day on-site, 1 day office in-country

Project Financial Plan				
Sources of financing		Total investment outlays (USD)		
		Amount spent already	Amount committed	Amount required
Internal capital		83,300	6,700	-
Loans (sources and cost)		-	-	-
Grants (sources)		-	-	-
Other (sources)		-	-	-
Proposed USAID procurement contribution		-	-	21,100
Total		83,300	6,700	21,100
Estimated annual facility or system operation and maintenance costs in USD/year (1996 USD)				
Planned sources of financing debt servicing, if required				% from source
From municipal budget - to be determined.				
Planned sources of revenue for operations and maintenance costs				% from source
From municipal budget - to be determined.				
Origin of Equipment and Materials		Czech and Slovak wastewater treatment plant equipment. Slovak sewer pipe.		

EAPS PROJECT INFORMATION FORM SLOVAKIA WASTEWATER INFRASTRUCTURE IMPROVEMENTS

EAPS Project Code

Project Title (one sentence defining the project scope)

Kamienka village proposes to install 1.6 kilometers of sewer main between Kamienka and Kamenica nad Cirochou which will connect the village to an existing wastewater facility operated by both communities.

Project Promoter Information

Name/Location	Village of Kamienka, Eastern Slovakia
Address	Obecny úrad, Kamienka 067 83 Kamenica nad Cirochou, Slovakia
Tel.	42-933-93114
Fax	None
Primary Contact	Village Mayor
Additional Contacts	Mayor of Kamenica nad Cirochou
Legal status of the proponent	Incorporated municipality
Other contributors/sponsors	None
Roles/Contributions of other sponsors	None

PROJECT INFORMATION

Short description of project

A common secondary wastewater treatment plant was constructed for Kamienka and nearby Kamenica nad Cirochou. This facility is currently operating at approximately 50% of design capacity because Kamienka has not completed its connection to the wastewater plant, and only 70% of Kamenica nad Cirochou residents are connected to its existing sewage collection system. The proposed work includes connection of Kamienka to the main sewage collection line flowing to the treatment plant. Kamienka has connected 60% of its residents to a sewage collection system within the village. Completion of the proposed connection would add 300 to 350 people to the common treatment facility in Kamenica nad Cirochou. The connection is sized to accommodate residents of Kamienka as the village completes its sewage collection system.

Project purpose

To procure and install 1.6 kilometers of sewage collection system between Kamienka and Kamenica nad Cirochou.

Expected environmental benefits	Eliminate discharge of untreated sewage from Kamienska to the local stream. Mitigate human health and aesthetic concerns related to direct contact with the local surface water.	
Impacted population	Current 320 residents connected to existing sewage collection system in Kamienska positively impacted by connection to existing wastewater plant, and minimizing aesthetic and human health concerns. Additional 230 residents will benefit with completion of sewage collection system within the village at a later date.	
Ambient surface water and/or ground water conditions before and after project implementation		
Pollutant	Estimated Effluent Baseline Conditions (kg/d)	Estimated Effluent Conditions at Project Completion (kg/d)
BOD ₅ (total, both communities)	195	10
TSS (total, both communities)	180	9
BOD ₅ (Kamienska only, 60% connected)	19	1
TSS (Kamienska only, 60% connected)	17	1

Relevant Environmental Standards (existing and proposed)

Current: BOD₅ = 60 mg/L, TSS = 55 mg/LProposed: BOD₅ = 50 mg/L, TSS = 40 mg/L

Project Status (describe activities and outputs completed to date)

Kamienska and Kamienska nad Cirochou have completed construction and began operation of a secondary wastewater treatment facility. Kamienska has completed a sewage collection system for 60% of village residents. A sewage collection main in Kamienska nad Cirochou exists and will be used to connect Kamienska to the wastewater treatment plant.

Implementation schedule

Activity	Time frame to complete	Start	Completion
Project preparation and design	-	-	Proposed design complete
Resolve remaining technical issues*	up to 4 weeks	Week 1	TBD
Tenders and procurement	6 - 8 weeks	Week 2 - 5	TBD
Construction	8 - 10 weeks	Week 8 - 13	TBD
Start-up and training	2 - 4 weeks	Week 16 - 23	TBD
Operation	On-going	-	-

Description of activities critical for preparation/construction period: Review existing as-built drawings of sewage collection system in Kamienska, and the main connection line in Kamienska nad Cirochou. Review available connection line design information. This information will be used to develop the construction bid package.

*Schedule of activities to resolve remaining technical issues

(Wastewater team consists of an expatriate wastewater engineer and a local engineer.)

Action	Output	Date	Responsibility/LOE
Review existing as-built drawings	Determine details of work completed to date	TBD	Wastewater team - 2 days in-country; 2 days office
Review available design information	Determine details of design activities completed to date	TBD	Wastewater team - 1 day in-country; 1.5 days office

Evaluate availability of local materials to complete proposed work	Determine whether Slovakia manufactures materials required for installation at existing plant.	TBD	Wastewater team - 1 day in-country; 2 days office
Prepare construction bid package	Bid package for submittal to qualified construction firms	TBD	K&M Engineering TBD 1 day on-site, 1 day office in-country

Project Financial Plan

Sources of financing		Total investment outlays (USD)		
		Amount spent already	Amount committed	Amount required
Internal capital		114,000	-	-
Loans (sources and cost)		-	-	-
Grants (sources)		-	-	-
Other (sources)		-	-	-
Proposed USAID procurement contribution		-	-	100,000
Total		114,000	-	100,000

Estimated annual facility or system operation and maintenance costs in USD/year: (1996 USD)

Planned sources of financing debt servicing, if required	% from source
From municipal budget - to be determined.	

Planned sources of revenue for operations and maintenance costs	% from source
From municipal budget - to be determined.	

Origin of Equipment and Materials	Slovak sewer pipe
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EAPS PROJECT INFORMATION FORM SLOVAKIA WASTEWATER INFRASTRUCTURE IMPROVEMENTS

EAPS Project Code

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Project Title (one sentence defining the project scope)

Lutila village proposes construction of a sewage collection system within the village, and connection to existing wastewater facilities in Ďiar nad Hronom.

Project Promoter Information

Name/Location	Village of Lutila, Central Slovakia
Address	Obecny úrad, ul. Stefanika 84 966 22 Lutila, Slovakia
Tel.	42-857-89326
Fax	None
Primary Contact	Village Mayor
Additional Contacts	None
Legal status of the proponent	Incorporated municipality
Other contributors/sponsors	City of Ďiar nad Hronom
Roles/Contributions of other sponsors	Ďiar nad Hronom will provide municipal wastewater treatment for Lutila

PROJECT INFORMATION

Short description of project

Domestic sanitary wastewater from individual septic systems currently impacts the local stream, with significant negative aesthetic problems in warmer months. New homes being constructed in the village include a sewage tap, although no collection system exists within the village at this time. A municipal wastewater treatment plant was commissioned in 1995 in nearby Ďiar nad Hronom, and was designed to accommodate all domestic wastewater from Lutila. The proposed Lutila project involves two phases: (I) construction of 1,815 meters of 400 mm PVC pipe from Ďiar nad Hronom to the edge of the village; and, (II) construction of approximately 1,865 meters of a gravity flow sewage collection system throughout the village. Phase I was expected to be complete by the end of 1995. The phase II design has been completed; funding is requested for construction of the Phase II system.

Project purpose

To procure and install 1,865 meters of sewage collection lines within the village, and connect the system to a recently completed sewage main between Lutila and Ďiar nad Hronom.

Expected environmental benefits

Eliminate discharge of untreated sewage from Lutila to the local surface water. Mitigate human health and aesthetic concerns related to direct contact with the local surface water.

Impacted population	Approximately 1,180 residents connected to existing sewage collection system in Kamienka positively impacted by connection to existing wastewater plant in Ďiar nad Hronom, minimizing aesthetic and human health concerns.
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Ambient surface water and/or ground water conditions before and after project implementation		
Pollutant	Estimated Effluent Baseline Conditions (kg/d)	Estimated Effluent Conditions at Project Completion (kg/d)
BOD ₅ (Lutila only)	65	3
TSS (Lutila only)	55	3

Relevant Environmental Standards (existing and proposed)	
	Current: BOD ₅ = 50 mg/L, TSS = 45 mg/L
	Proposed: BOD ₅ = 40 mg/L, TSS = 35 mg/L

Project Status (describe activities and outputs completed to date)	
	Phase I sewage main connecting Lutila with Ďiar nad Hronom is complete, as well as common wastewater treatment plant located in Ďiar nad Hronom. Newly constructed homes within Lutila are supplied with sewage taps.

Implementation schedule			
Activity	Time frame for completion	Start	Completion
Project preparation and design	-	-	Proposed design complete
Resolve remaining technical issues*	up to 4 weeks	Week 1	TBD
Tenders and procurement	6 - 8 weeks	Week 2 - 5	TBD
Construction	16 - 18 weeks	Week 8 - 13	TBD
Start-up and training	4 - 6 weeks	Week 24 - 31	TBD
Operation	On-going	-	-
Description of activities critical for preparation/construction period: Review existing as-built drawings of sewage collection system between Lutila and Ďiar nad Hronom. Review available sewage collection system design for the village. This information will be used to develop the construction bid package.			

*Schedule of activities to resolve remaining technical issues.
(Wastewater team consists of an expatriate wastewater engineer and a local engineer)

Action	Output	Date	Responsibility/LOE
Review existing as-built drawings	Determine details of work completed to date	TBD	Wastewater team - 2 days in-country; 2 days office
Review available design information	Determine details of design activities completed to date	TBD	Wastewater team - 1 day in-country; 1.5 days office
Evaluate availability of local materials to complete proposed work	Determine whether Slovakia manufactures materials required for installation at existing plant.	TBD	Wastewater team - 1 day in-country; 2 days office

	Prepare construction bid package	Bid package for submittal to qualified construction firms	TBD	K&M Engineering 1 day on-site, 1 day office in-country
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Project Financial Plan

Sources of financing		Total investment outlays (USD)		
		Amount spent already	Amount committed	Amount required
Internal capital		101,700	106,700	106,700
Loans (sources and cost)		-	-	-
Grants (SEF)		-	106,700	106,700
Other (sources)		-	-	-
Proposed USAID procurement contribution		-	-	253,000
Total		101,700	213,400	466,400

Estimated annual facility or system operation and maintenance costs in USD/year: (1996 USD)	
Planned sources of financing debt servicing, if required	% from source
From municipal budget - to be determined.	
Planned sources of revenue for operations and maintenance costs	% from source
From municipal budget - to be determined.	
Origin of Equipment and Materials	Slovak sewer pipe

EAPS PROJECT INFORMATION FORM SLOVAKIA WASTEWATER INFRASTRUCTURE IMPROVEMENTS

EAPS Project Code

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Project Title (one sentence defining the project scope)

Šurany town proposes to construct a sewage connection line to add approximately 450 residents to its existing wastewater treatment facility.

Project Promoter Information

Name/Location	Town of Šurany, Western Slovakia
Address	Mestský úrad Šurany, Námestie hrdinov ... 1 942 01 Šurany
Tel.	42-3624-2305
Fax	None
Primary Contact	Mayor Jozef Šutka
Additional Contacts	None
Legal status of the proponent	Incorporated municipality
Other contributors/ sponsors	None
Roles/Contributions of other sponsors	None

PROJECT INFORMATION

Short description of project

The proposed project will add approximately 450 residents to the 7,600 currently served by an existing wastewater treatment facility operated by Šurany. Wastewater from residences not currently connected to the treatment plant reaches the local surface water bodies, including a stream and several lakes, untreated. Aesthetic problems are evident especially in warmer months. The local stream generally has low flow velocities, contributing to the aesthetic problems. In addition, ground-water levels in the region are close to ground surface, causing direct impacts on the local aquifer from individual septic systems. The connection line proposed is comprised of various pipe sizes, and would run 1,480 meters. The existing treatment plant is operating below design capacity and can accept the new flows without modification.

Project purpose

To procure and install 1,480 meters of sewage collection lines within a certain portion of the town not currently served by the existing treatment system.

Expected environmental benefits

Reduce discharge of untreated sewage from residences in Šurany to nearby streams, lakes, and shallow aquifer. Mitigate human health and aesthetic concerns related to direct contact with the local surface water and ground water.

Impacted population	Approximately 450 residents connected to existing sewage collection system in Šurany positively impacted by connection to existing wastewater plant. Impacts to nearby lakes will have positive impact on summer visitors to the region, reducing aesthetic and human health concerns.
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Ambient surface water and/or ground water conditions before and after project implementation		
Pollutant	Estimated Effluent Baseline Conditions (kg/d)	Estimated Effluent Conditions at Project Completion (kg/d)
BOD ₅	15	2
TSS	22	2

Relevant Environmental Standards (existing and proposed)	
	Current: BOD ₅ = 45 mg/L, TSS = 35 mg/L
	Proposed: BOD ₅ = 35 mg/L, TSS = 30 mg/L

Project Status (describe activities and outputs completed to date)	
	Šurany currently operates a municipal wastewater treatment facility that serves approximately 7,600 people. The town adds to the existing sewage collection system as funds become available.

Implementation schedule			
Activity	Time Frame for Completion	Start	Completion
Project preparation and design	-	-	Proposed design complete
Resolve remaining technical issues*	up to 4 weeks	Week 1	TBD
Tenders and procurement	6 - 8 weeks	Week 2 - 5	TBD
Construction	12 - 14 weeks	Week 8 - 13	TBD
Start-up and training	2 - 4 weeks	Week 20 - 27	TBD
Operation	On-going	-	-
Description of activities critical for preparation/construction period: Review existing as-built drawings of sewage collection system in area surrounding the proposed line location, and its connection location to the existing treatment facility. Review available design information for the proposed line. This information will be used to develop the construction bid package.			

*Schedule of activities to resolve remaining technical issues
(Wastewater team consists of an expatriate wastewater engineer and a local engineer)

Action	Output	Date	Responsibility/LOE
Review existing as-built drawings	Determine details of work completed to date	TBD	Wastewater team - 2 days in-country; 2 days office
Review available design information	Determine details of design activities completed to date	TBD	Wastewater team - 1 day in-country; 1.5 days office
Evaluate availability of local materials to complete proposed work	Determine whether Slovakia manufactures materials required for installation at existing plant.	TBD	Wastewater team - 1 day in-country; 2 days office

	Prepare construction bid package	Bid package for submittal to qualified construction firms	TBD	K&M Engineering TBD 1 day on-site, 1 day office in-country
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Project Financial Plan

Sources of financing		Total investment outlays (USD)		
		Amount spent already	Amount committed	Amount required
Internal capital		18,100	-	18,100
Loans (sources and cost)		-	-	-
Grants (SEF)		-	83,300	83,300
Other (sources)		-	-	-
Proposed USAID procurement contribution		-	-	181,700
Total		18,100	83,300	283,100

Estimated annual facility or system operation and maintenance costs in USD/year: (1996 USD)

Planned sources of financing debt servicing, if required		%	from source
	From municipal budget - to be determined.		

Planned sources of revenue for operations and maintenance costs		%	from source
	From municipal budget - to be determined.		

Origin of Equipment and Materials	Slovak sewer pipe
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