

PART II: COMMUNITY REPORTS

AMBLER

Ambler

Ambler, population 333, is located on the Kobuk River in the interior of the Northwest Arctic Borough. The city operates the water and sewer utility. Most homes in Ambler are served by a piped system originally constructed in 1975. Residents without piped water haul water from a central watering point, and dump their honeybuckets at a dump site two miles from town.

City water is pumped from two wells and then treated, stored, and distributed through a loop of buried, heated lines. The wastewater system has two collection lines; two lift stations pump the sewage to a nearby lagoon. Two operators normally work three hours per day, seven days per week, alternating two weeks on and two weeks off; major or emergency repairs are extra hours. They are paid \$13 per hour and are certified at the OIT level. The operators keep excellent records and report monthly to the city council.

Detailed background information on Ambler, its water and sewer system, operations, maintenance, and management is provided in the First Year Report.¹

Project Plan and Objectives

The Partnership Agreement work plan detailed the following general activities:

- **Utility management.** Develop a partnership team to carry out the activities of the O&M project; establish a part-time utility manager position; purchase computer hardware and software; develop a plan for raising revenues.
- **Preventive maintenance.** Develop a parts inventory for the water and sewer systems.
- **Operator support.** Train utility operators to Level I certification; pay their salary to develop the parts inventory and to increase operator hours for preventive maintenance; purchase protective clothing.
- **Community education.** Educate homeowners on the costs of operating and maintaining utilities, emphasizing their responsibilities for the maintenance and appropriate use of the utilities.

Project Implementation

The project began July 1, 1996, and with one quarter extension, ended September 30, 1997. The \$40,000 grant was matched with \$80,383 in local contributions.

Though the project got a late start in hiring a utility manager, once the manager was on board the team made steady progress on its planned activities. A working partnership was established among the city administrator, the utility manager, the two operators, the remote maintenance worker, and a grant writer from Maniilaq regional health corporation.

¹ Institute of Social and Economic Research, *Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program and Nine Community Pilot Projects: First Year Report*, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

The operators were given three additional hours per week for preventive maintenance and building the inventory of spare parts. One operator did all the inventory work, inventorying and organizing the parts on hand, and identifying, purchasing and stocking needed parts. It appears that the inventory was never computerized. Protective clothing was purchased for the operators, and between the two of them they attended six training courses. Neither operator passed the Level I certification exam, however.

The utility manager worked 20 hours per week. A computer was purchased and installed. The manager worked on a plan to support the operation of the water and sewer system. A fee for the watering point was proposed and considered by the city council. A newsletter was prepared discussing homeowners' responsibility for in-home repairs; the need to properly heat homes to prevent freeze-ups; materials not to be flushed down the commode; the cost of new equipment; and the possibility of a fee increase if the equipment continued breaking down. The newsletter was sent to customers along with their billing statements. Some of this information was repeated on the cable scanner and in announcements over CB radio, accompanied by reminders to pay utility bills.

Project Outcomes

The project activities and short-term objectives were largely accomplished. By all reports, the team approach was effective; the project could not have been completed without the active collaboration of every member of the team. The grant writer from Maniilaq assisted the city administrator in examining needs, completing the application, and working on a long-term management plan. The Remote Maintenance Worker helped the operator with the method of the inventory, the organization of the spare parts and system for locating them, and identification of needed parts and suppliers. The operator and utility manager worked together to order parts and negotiate prices with suppliers. They also worked together with the city administrator to develop the public education campaign. The administrator hired and trained the utility manager and assisted her with financial management and accounting of the grant funds. The utility manager relieved the administrator of some of her overload and carried out the planning and management functions for the water and sewer utility during the life of the project. The ANHB project director also helped define the partnership activities and keep the project reporting on track. The communication and cooperation between team members not only aided them in their tasks, but also developed their working relationships, expanded their effective resources, and gave them a broader understanding of the system as a whole.

Everyone agreed that the utility manager made a big difference in the smooth operation of the utility and the city. It was easier for the operators to get the parts they needed in a timely fashion. The burden on the city administrator was lightened, and the grant reports got done. She was able to increase collections, save money on parts, and develop a plan, including instituting fees for home repairs and fee increases for the watering point. The new computer was also a real asset, particularly when the city computer failed and the second computer kept the city running.

In the close-out interview, the operator claimed that the spare parts inventory increased his efficiency at work by reducing the time it took to replace parts. The administrator claimed that ordering parts in advance enabled the city to negotiate a better

price, thereby saving the utility money. The operators were pleased with the protective clothing they received and the extra hours for the inventory and preventive maintenance activities. The training goal of Level I certification for both operators was not achieved. Presumably the training itself was still of value in increasing the operators' knowledge.

While there is no evidence in the record either way on the effects of the public education campaign generally, posting the names of delinquent customers on the cable scanner was highly effective. Collections at times were as high as 95 percent.

Long-Term Effects

While the short-term benefits of the project are quite clear, it is not clear how much will be sustained long term. The utility manager left at the end of the project. Though the mayor and city administrator very much wanted to re-fill the position, they did not have the funds for it. The operator who was most active in the project left a few months later, to take another job. The close working relationships and institutional understandings forged during the project have been eroded by turnover. The replacement operator is inexperienced and not certified. Though the close-out interview mentions that the flexible extra hours for preventive maintenance activities continue, there is no clear evidence of this in the final operator interviews conducted three months later. It is unclear whether the inventory of spare parts will be maintained.

There is evidence, however, that 1998 revenues were higher than in previous years. While the utility still does not cover its costs, this nevertheless represents a real increase in resources for the long term. And the city administrator is still on the job, with increasingly valuable skills and experience.

HOOPER BAY

Hooper Bay

Most homes in Hooper Bay (population 1,012) are not plumbed. The exception is 25 houses in the new HUD subdivision, which use flush haul. Other residents haul pond water for drinking and treated well water from the washeteria or from the old town site well for washing. The well water is too salty for their taste and they mistrust chlorination and fluoridation. The old plant has no ATV access, so the water must be packed entirely by hand. The washeteria, built in 1987, is very small for a community this size.

Households haul their own honeybuckets, or pay a private operator to haul them. The second phase of Hooper Bay's water and sewer improvements—an access road to the new sewage lagoon and land fill—was begun in 1998. The city has requested funds to construct an additional washeteria and pipe water to homes.

The lead water plant operator and his alternate work 35 hours per week one week on and one week off. Their main duties are to take meter readings in the water plants (e.g., chlorine) and watch out for contamination. They maintain the washers and dryers in the washeteria and the major components of the water plant, like the boilers. When the project began, both were certified at the OIT level. The lead operator, who has ten years experience and formerly worked as an RMW, is paid \$15 per hour; the alternate earns \$10 per hour. They report to the city administrator.

The two water plants in Hooper Bay are well run and well maintained; plant O&M is not at issue. Current sanitation issues noted in the record include sewage and solid waste management (storage of raw sewage outside homes, spillage in transit to the dump, and dumping at the solid waste site), water and sewer planning, utility finance, and water quality for consumption.

Detailed background information on Hooper Bay, its water and sewer system, operations, maintenance, and management is provided in the First Year Report.²

Project Plan and Objectives

The intent of the O&M pilot project in Hooper Bay is to develop operations and management capacity complementary to planned capital improvements in water and sewer. Using the project director's field notes to elaborate on the written work plan in the partnership agreement, the plan provides for the following activities:

- Hire a project manager
- Operator training: the goal is to bring current operators up to Level I certification, and to train a pool of six or seven alternates at the OIT level
- Utility management training for the city administrator, city clerk and bookkeeper

² Institute of Social and Economic Research, *Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program and Nine Community Pilot Projects: First Year Report*, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

- Community education: train four to six young people to serve as community sanitation education specialists to work on a home-by-home basis educating residents about community-wide sanitation management

- Develop a municipal ordinance governing:
 1. Solid waste facility operations, including commercial user fees
 2. Water and sewer facility operations
 3. Water and sewer user fees
- Develop an intermediate range projection of water and sewer facility expenses and user costs
- Analyze a variety of options for delivery of services (i.e. municipal operation of trash pickup, private operation, technical review of dumpster and compactor systems)
- Develop a sanitation advisory council (added later)

The award amount was \$39,000 to be spread over four quarters. The scope of work was informally revised in on-going consultation with the ANHB project manager; these amendments were not recorded.

Project Implementation

The project started on July 1, 1996, and with two quarter extensions, ended December 31, 1997; \$30,710 of the \$37,500 grant was disbursed. It was matched with \$36,926 in local contributions.

The local resident hired as project manager was from a well-respected family in Hooper Bay, though she herself had been raised in Seattle and Anchorage and returned only as an adult. She recruited four people to join her in taking a course by teleconference in small water systems. She completed the course and received her OIT certification. The alternate operator who was registered for the course passed away before it began. The other three people dropped out and never fulfilled their agreement to reimburse the project for their registration fees. Funds were also spent for the manager's hotel and registration to two other conferences or training courses; the conference was forfeited when a death in her family prevented her from attending. The training she attended and completed. The lead operator also traveled for the training but never attended any of the sessions. Earlier, the lead operator passed his Level I certification exam, though there is no evidence in the record that project funds were used.

There is no evidence in the record that any utility management training was ever pursued for the city administrator, city clerk or bookkeeper. This is understandable in light of the turmoil, turnover and periods of vacancy in the city administrator, city clerk and bookkeeper positions during the life of the project.

The project manager attempted to hire three young welfare recipients as community sanitation education specialists. These proposed hires were rejected by the city council. She then recruited and was successful in hiring others. One quit soon after, however, because her husband passed away. The remaining two conducted a survey about

water and waste management in every home in the community. The results of the survey were reportedly very informative to the project manager and to the city council. Plans to use these two employees for household education on the solid waste management plan were thwarted by lack of funds: the city diverted project funds to pay other bills. The employees quit because they hadn't been paid.

With the assistance of the RUBA, the project manager drafted a water and sewer ordinance, a litter ordinance, and a solid waste management plan. The plan and ordinances were presented to the city council and approved on first reading, but by the end of the project had not been through public comment, second reading, or final adoption. In October 1998, the new administrator indicated that they were waiting in the file drawer.

The solid waste management plan included cost analysis and proposed household fees to cover dump operations. There is no evidence in the record that any cost analysis was done for water and sewer. A grant was written for several new washers and dryers and a token machine for the washeteria. A computer was purchased for project activities. Regarding service options, the project manager did inform herself about flush-haul, and concluded that it was a better choice for Hooper Bay than piped water and sewer. She failed to persuade anyone else, however, as community sentiment was strongly set in favor of piped service.

The final activity that was added early in the project was establishing an advisory council on sanitation. The manager sought members representing the city council, the village council, high school students, elders, two from the community at large, and the water plant lead operator. The function of the council would have been to help identify sanitation needs, review proposed projects, help write water and sewer ordinances, plan for litter and pollution control, and advise the city and traditional councils and outside agencies on sanitation issues. Despite repeated requests from the project manager and a letter from ANHB, the village council never appointed a member. The advisory council never functioned.

To complete these activities, the project period was extended two quarters, through December 1997. While quarterly activity reports were completed and submitted to ANHB, this community never returned the ISER questionnaires requesting data for evaluation of the project.

Project Outcomes

Although the project manager made a conscientious effort and a number of specific tasks were completed, only one of the original project objectives was partially achieved. There is no pool of OIT trained personnel. No community education was accomplished. A municipal ordinance was drafted, but never adopted or even discussed. Cost analysis and revenue planning were undertaken for solid waste, but not for current water operations, much less for future water and sewer improvements. The advisory council was never launched. The only increase in management expertise was the developing expertise of the project director herself; she now serves as city clerk. As discussed more below, the effective increase in community capacity for O&M was insubstantial.

It is notable that the project scope of work did not include building a partnership team as one of the activities. This omission reflects a fundamental problem: there was no buy-in or collaboration on this project among the key players. The grant application and the scope of work were written by the city administrator with no council or community input. The project objectives, other than employment, were vague. The manager hired was new to the community and was given very little guidance or assistance. Her conscientious efforts and modest accomplishments were undermined by city financial mismanagement, turmoil and neglect, if not political obstruction. Though she attended several meetings, the council never really understood what the project was about. The village council never understood and never collaborated. There was no teamwork.

Long-Term Effects

The long term results of this project were slight. The draft ordinances might (or might not) someday be taken up again. The project manager gained valuable training, information and experience; she went on to serve in an Americorp position in the community working on environmental health issues, and later assumed the city clerk position. Her expertise notwithstanding, one insider thought she was too young and shy to have much impact.

The city leadership and administration did eventually stabilize and put city finances in order, paving the way for water and sanitation improvements. And communication and cooperation between the major players and the city and tribe improved. It remains to be seen whether the community as a whole will effectively participate in water and sewer planning. This question arises because community review of Phase I was not effective: the review failed to identify problems in the plans for new roads—problems which later caused dissent among residents and required redesign. Village leaders and agency personnel are jointly responsible for insuring that the process works.

As of this writing, the lead water plant operator had resigned due to burnout. This is a major setback for Hooper Bay and a real loss in its capacity for effective O&M. The lead operator had ten years' experience and formerly worked as an RMW. He did an excellent job of operating and maintaining the water system despite insufficient funds for spare parts. He wanted more time off but felt that his alternate was not experienced enough to be left in charge. The turn of events indicates that the city management was unable to deliver the kinds of support the operator needed to sustain morale.

HYDABURG

Hydaburg

Hydaburg, population 425, is located on Prince of Wales Island in Southeast Alaska. Over 95 percent of homes are served by piped water and sewer operated by the city. Both water and sewer systems are compromised by major breaks and leakage. In his January 29, 1996 letter the mayor characterized the status of the utility:

Water quality, operator/manager training, operator/manager salary support, management of accounts, and inventory of replacement parts are a few of the areas needing improvement. The City is in financial trouble and could use this grant money to improve the operation and maintenance of these facilities. The city uses volunteers in lieu of monthly payments, due to the fact that we are having trouble generating revenue from these services. Our only employee in the water operator's position is under-trained and we have had a few "boil water" notices placed in effect by Alaska Department of Environmental Conservation.

The water operator started in August, 1995. He is paid to work 25 hours per week and has OIT certification; he has no alternate. He does have an AWWMA mentor from Petersburg. The mentor's trip report from March, 1996, characterized the operator as conscientious and the plant as well maintained. It noted that the operator lacked supplies and not been paid "for quite some time" due to city financial problems.

The sewer system had not been maintained. The sewer operator could not be located for an interview. Two months later the position was vacant.

Additional detail is provided in the first year report.³

Project Plan and Objectives

The partnership agreement work plan provided for five activities:

- **Partnership Team.** The city will identify a grant manager for the O&M project. The grant manager, water operator, and Public Work's foreman will be the city's representatives on a partnership team that includes representatives of agencies and organizations that provide O&M related support services to the city.
- **Community Education.** Get information out to the public on what it takes to operate and maintain the water and sewer system in the community.
- **Curb Stop Location/Repair.** Locate curb stops or install new ones where they are needed so that services can be cut when needed. Many curb stops cannot be located or are not accessible.
- **Sewer System Maintenance.** Perform routine maintenance of sewage treatment system; repair collection system lines that are leaking due to no maintenance, resulting in an unsafe environment; train personnel on how to repair or replace sewer lines and maintain lines in the future.

³ Institute of Social and Economic Research, *Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program and Nine Community Pilot Projects: First Year Report*, prepared for U.S. Environmental Protection Agency, Region 10, January, 1997.

- **Operator/Manager Training.** The city and ANHB will coordinate and identify appropriate training that meets the needs of the community. The emphasis will be on training in the field.

Project Implementation

The project officially began September 1, 1996, and was terminated February 28, 1998. Only \$6,881.25—one quarter of the \$27,525 grant—was ever disbursed; it was matched with \$75,305 in local contributions.

The project start was delayed by political turmoil in the city government. The mayorship turned over three times between July and December, 1996. (For additional information see the First Year Report.⁴) A deadline set by ANHB, coupled with extensive assistance by telephone and faxed to the city clerk, finally produced a budget and plan of work which the acting mayor signed. The city clerk was the designated grant manager.

For community education, the city sponsored a poster contest at the school. Posters addressed topics including: why it is important for people to pay their bills, what water is used for, how the money is spent on supplies for water treatment, how those supplies make the water drinkable, the hazards of the chemicals, and what supplies are needed to prevent accidents.

Three city employees began the task of locating curb stops, but only a few were located before work was suspended when winter weather set. The water operator and an assistant repaired one sewer line and a few broken water lines that had caused severe water loss. The water operator received some training and renewed his OIT certification.

These activities were undertaken in the first few months of the project. The clerk reported no further activity. Nevertheless, in August, 1997, the project was extended two quarters at the city clerk's request. By September the clerk had gone to Anchorage to pursue higher education and the new mayor was just learning about the project. In a telephone conversation he told ANHB that progress had been made on related activities independent of the ANHB grant. Specifically, customer service agreements were being amended to spell out the conditions for discontinuing service, a leak detection study had been done, and two thirds of the curb stops had been located in connection with a road project. They were short of funds to change out the old boxes and shut-off valves, however. The ANHB project director encouraged the mayor to update the budget and scope of work and submit the fourth quarter report so ANHB could send them the next increment of grant money.

By October the new mayor had gone on medical leave and the assistant administrator and new city clerk had both quit. In December ANHB repeated the offer to amend and revive the project to the interim mayor, who had been one of the original authors of the project. There was a flurry of activity: the new city clerk worked with RUBA to straighten out the books; the new city mechanic, who did not live in Hydaburg, got a lot of city machinery up and running again; and the RMW came to town to work with the operator on the chlorinator and to develop a parts list for the project. The city clerk, who was in frequent telephone contact with ANHB, also pledged that the overdue

⁴ See note 4.

quarterly reports would be submitted, the parts ordered and the project finished on time; but none of this materialized. In February, 1998, the newly elected mayor—the sixth in two years— took over and the city clerk, with a tenure of two and a half months, returned to Anchorage. The project expired at the end of the month.

Project Outcomes

The activities reported were a very small portion of the work plan. In addition to sewer line repairs the plan called for routine maintenance. Both were intended to provide practical training for personnel on how to repair, replace and maintain sewer lines.

The community education component of the work plan called for two community meetings, and public service announcements in the island paper, the school paper, on TV, and in posters and flyers to help residents understand why they must pay for their services and what the money goes for; the larger objective was to collect on delinquent accounts. The purpose of the curb stops was also collections enforcement.

Independent of the O&M pilot project, in June 1996, the vice mayor initiated action to collect on overdue accounts, including taking 43 delinquent customers to small claims court. (For more detail, see the First Year Report.) The enforcement actions were dropped, however, after the new mayor was elected in November 1996. Efforts to locate curb stops ceased about the same time. Collections dropped again. Appeals by the city clerk for the city council to aggressively pursue collections to support operations apparently had no effect. A year later (early December 1997) the interim city clerk indicated that the water, sewer and solid waste utilities combined were \$66,000 in the hole and collection rates were around 50 percent.

There is no evidence that community capacity increased in any dimension, even in the short term. The one relative bright spot is that the water operator—the only city employee who did not turn over in the two year period—accumulated two more years of O&M experience and renewed his OIT certification. I also note in the record a 1996 rate study prepared by the vice mayor, that provides a very comprehensive O&M cost analysis for the water, sewer and solid waste utility. It makes six recommendations, including revised rates, service shutoff for nonpayment, and eliminating leaks.

Long-Term Effects

The deep political divisions and turmoil in this community prevented them not only from using the grant, but also from resolving their O&M problems or their underlying financial problems. In May 1998, Hydaburg began to work with RUBA to address its leadership, management, and personnel problems.

KOTLIK

Kotlik

Kotlik (population 543) is located on the Yukon River in the Yukon-Kuskokwim Delta. Over 95 percent of households have no plumbing. Residents haul water from the washeteria or natural sources and dump their honey buckets in city-maintained haul containers. A vacuum sewer and circulating water utilidor is planned.

The honey bucket haul operator, who has worked with this utility since 1990, is paid \$15 per hour. He and his alternate average 25 hours per week on a 2-week on and 2-week off schedule. His alternate was hired in 1996. The operators dump the haul buckets when they get full; clean up spills; lime the bunkers and clean the haul buckets every spring; order supplies; and maintain the four-wheeler, snow machine, and haul trailer. Maintaining supplies, parts and tools for repairs is difficult due to limited finances.

The utility manager position, created in 1990, is responsible for the water and sewer plant, the washeteria, honey bucket haul, electricity, and cable service for Kotlik. No fees are charged for water or honey bucket haul. Honey bucket services are currently funded by the traditional council's bingo and pull-tab operations and fund-raising events.

Detailed background information on Kotlik, its water and sewer system, operations, maintenance, and management is provided in the First Year Report.⁵

Project Plan and Objectives

The intent of the O&M Pilot Project in Kotlik was to improve the operation of the honey bucket haul system, to develop financial management capacity, and to forward fund O&M. The partnership agreement work plan provided for five activities for which the partnership team was responsible:

- purchasing a computer and software for tracking utility accounts, parts, supplies inventory, and purchase orders;
- establishing a separate account for honey bucket haul system donations and revenues from bingo and pull-tabs and from special fund-raisers; the fund will be saved for future O&M expenses after the end of the pilot project;
- operator support for one year;
- travel and per diem for an occupation related health exam for the haul operator;
- purchasing a Honda four-wheeler and extending the boardwalk at six haul container sites.

The work plan was later amended to eliminate the boardwalk extensions and the purchase of a computer and software; the funds were moved into operator support.

⁵ Institute of Social and Economic Research, *Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program and Nine Community Pilot Projects: First Year Report*, prepared for U.S. Environmental Protection Agency, Region 10, January, 1997.

Project Implementation

The project began July 1, 1996, and, with a two quarter extension, ended December 30, 1997. The \$37,000 grant was disbursed in three increments, and was matched with \$10,489 in local contributions.

The city employees worked together to implement the project; participation by outside agency staff was insubstantial. The major project activity, however, was to pay operator salaries for 16 months. The utility manager claimed that they increased their hours of work. (This is not substantiated in the operator interviews.) The senior operator also flew to Bethel for a health exam. In the first month they purchased a new Honda four-wheeler to haul the sewage containers.

Funds for the boardwalk extensions were not needed because PHS had already done the work as part of improvements to the honey bucket haul system. The computer was apparently not a priority.

The forward funded O&M account was established by the utility manager. Deposits to the account were slow both because bingo and special fund-raising project revenues went to paying off the city's IRS debt and because basketball season limited the opportunities for fund raising. Fund raising and deposits were expected to pick up in January. By March, \$4,109 had been deposited in the fund. During the same period, \$9,795 in ANHB grant funds were spent on utility operations. The utility manager retired in April, 1997. At close out in December, neither his replacement utility manager nor the city clerk could say how the account was set up and identified, or how much money was in it. There is some ambiguity, however, as they also claimed that a fund-raiser in November brought in \$5,000 for the account.

Kotlik's project documentation, reporting, and cooperation in data collection for the evaluation were all excellent.

Project Outcomes

The ANHB O&M grant, in conjunction with concurrent infrastructure improvements funded by PHS, clearly sustained and improved honey bucket operations in the short term. Many other communities have discontinued their honey bucket haul services for lack of funds to support them. The utility manager asserted that the increase in operator hours improved public health, equipment maintenance and operator morale, as well as customer service. Dumping the containers more regularly meant that they were not over full, so the task was easier, faster, and they spilled less often. They also had more time for maintenance of the equipment. And the operators liked the extra hours.

He also reported that the new four-wheeler saved the utility money for gas. The ANHB project director observed that the four-wheeler was well maintained.

The O&M account serves as a budget reserve, cushioning the variance revenues and deferring the fiscal and operational crisis. (It should also accumulate savings to replace equipment, but nobody mentioned this.) In the project close out interview, city participants also said that the O&M pilot project had clarified for them the operation and maintenance requirements for a sustainable level of service, and what would have to happen (financially) for this service to be able to continue in the community. They gave

more thought to the cost of management, operation and maintenance of the utility because they had to quantify it in a way they had not done before.

Long-Term Effects

Will these short-term benefits to utility O&M and finance have any effect in the long term? While the accounting is not complete, the record is clear that bingo, pull tabs and special fund-raising events over the life of the project did not generate enough revenue to support the current operations of the honey bucket utility, let alone savings to periodically replace worn out equipment. The retired utility manager thinks that they could with regular fund raisers, and he intends to provide that impetus during his tenure on the utility board. If they fail to replenish the special O&M fund balance each year it will be depleted and lose its function to even out cash flow. Honey bucket haul services will only be needed until about 2001, when the new sewer system is finished. He acknowledges that when they get piped water and sewer they will have to institute monthly service fees; it is not clear why he is averse to fees for honey bucket haul services now. Some community leaders hope outside sources will again subsidize operations.

Kotlik has an enviable record of continuity in leadership and staff, so the things it learned about sustaining the utility will not be lost. The retired utility manager, with all his expertise and leadership, is now serving on the utility board.

If the finances were in place, the improvements in O&M and public health might be sustained. Both operators are conscientious, skilled and resourceful. The first would like to retire, but stays on because the community needs him. The second, however, expects to leave to take a PHS job with more hours. With construction work available on the new water and sewer system, the city may have difficulty replacing him.

NOORVIK

Noorvik

Noorvik (population 631) is located on the Kobuk River in the Northwest Arctic Borough. Eighty percent of homes are served by piped water and sewer operated by the city. Funds to connect the remaining homes are pending.

Water is drawn from the river, treated, stored, and circulated to homes through a utilidor. The vacuum sewer, constructed in the 1970s, is the oldest in the state. It is expensive to maintain, especially the home units. The city charges households for the cost of repairs to the home units. Fees for basic service are \$85 per month, but this does not cover costs. Water and sewer operations are subsidized by city-operated bingo and cable TV and state revenue sharing.

Detailed background information on Noorvik, its water and sewer system, operations, maintenance, and management is provided in the First Year Report.⁶

Project Plan and Objectives

The partnership agreement work plan listed a number of activities:

- **Partnership Team.** The city will form a partnership team comprised of current major players in O&M efforts to carry out planned activities.
- **Parts Replacement.** The water and sewer operator will replace the 30 oldest and most problematic activators.
- **Activator Replacement Course.** When installing the new activators, the water and sewer operator will conduct a training course on the proper care and basic maintenance of the vacuum sewage household plumbing for at least one member of each household. The operator will spend at least one-half hour with each household.
- **Dos and Don'ts Manual.** A local person will be employed to develop an easy-to-read manual on the proper care and basic maintenance of the vacuum sewage system household plumbing for homeowners. This person will also coordinate with educators in the community schools to develop educational materials for school children on the proper use and care of vacuum sewage system household plumbing.
- **Operator Training and Certification.** Some funds from this project will be used for on-site training for air vac systems and to provide the funds that are necessary to have the water and sewer operator elevate to Level II and the two alternates to OIT on water treatment and also training towards certification for water distribution, wastewater collection and wastewater treatment.
- **Customer Use Agreements.** City staff will develop a customer use agreement document that details city and customer responsibilities for service connections and the operation and maintenance of the vacuum system.

⁶ Institute of Social and Economic Research, *Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program and Nine Community Pilot Projects: First Year Report*, prepared for U.S. Environmental Protection Agency, Region 10, January, 1997.

Project Implementation

The project began July 1, 1996, and, with a three quarter extension, ended February 28, 1998. The \$11,818 grant was disbursed in three increments, and was matched with \$10,700 in local contributions.

This project had a slow start due to other commitments. An active partnership among the city administrator, two operators, the RMW and the ANHB project director was established and sustained with frequent communication and collaboration throughout the project. Additional collaborators included two Maniilaq employees, two PHS engineers and an AIRVAC company representative.

In the first quarter a writer/illustrator was hired to compile information from the operators, clinic, schools and city staff and prepare the Dos and Don'ts manual. He completed a rough draft before leaving to work his family mining claim. A new writer/illustrator was not hired until the fourth quarter. It took two more quarters to finish and print the manual. The finished product was distributed not only to every household, but also to the school, grades 1-3, and some organizations.

In the second quarter five activators were purchased and installed, and the operator spent half an hour or more in each home explaining their use. There was a marked improvement in vacuum pressure at the plant. In each of the next two quarters five more activators were purchased and installed. After a three-quarter lull, fifteen activators were purchased in the last quarter, to be installed as needed. By close-out, a total of 30 had been purchased and 24 installed, with six remaining in inventory. At the time of each installation the operator spent half an hour or more in each home explaining how and how not to use and maintain the home plumbing components. In the second half of the project the operator used a checklist to make sure he covered everything each time.

The operators received extensive training over the course of the project. The lead operator attended a course and received his OIT certification in wastewater treatment, adding to his existing Level I certification in water treatment. He also passed a course in hazardous waste operations. The two alternate operators attended water treatment training but failed to pass the OIT certification test; the first alternate passed on his second try and was granted an increase in pay. He later attended and passed a course in boiler maintenance, attended a course in plant maintenance, and received OIT certification in wastewater treatment. Both alternates attended a workshop in field operations. The RMW persisted over the entire 20 month period and finally arranged a regional workshop on AIRVAC Vacuum Sewer systems with a company representative, which all the operators attended. The representative also came to Noorvik to inspect and give recommendations. The operators said this was the most informative training they've had, though it was too short. The city administrator also attended a utility management workshop.

While no work was reported on customer use agreements during the project, by the time of the close out interview these had been drafted by the city administrator, reviewed by the city council, and revised to incorporate a statement of the city's obligations to the customer.

In a related development, the city adopted a new policy that home repairs would not be performed until customers were current on their bills. The intent was to clear up an

approximately \$5,000 backlog in unpaid bills for home repairs. Home repairs are quite expensive: customers are charged \$19.27 per hour plus parts. One activator for a sink costs over \$180, and assembly for the unit runs about \$300. It can take up to an hour and a half to pull a toilet to replace a diaphragm; complete plumbing for a toilet (29 parts) runs in excess of \$1,500.

Project Outcomes

There was lots of positive feedback from residents about the dos and don'ts manual, which had been written and illustrated locally. People enjoyed getting it and looking at it, and said they learned some things they hadn't known. For instance, they learned not to put grease or coffee grounds down the drain, and not to flush tampons or toys down the toilet. People started taking better care of their systems. In the first nine months after distributing the manuals, the operators had not had a single call to remove toys from the toilet plumbing.

In the close-out interview in September, 1998, the primary operator estimated that the operators were making 25 percent fewer visits to households for plumbing problems. Three things contributed to this improvement: homeowner education; the new policy requiring customers to be current on their bills; and the 24 new activators that replaced the most problematic old units. Still, there are 90 houses with the old style plumbing units that cause problems. Also, the homes that got the new activators still have other control components that are old, and these cause problems too.

One spin-off of the operator training activity was that when the AIRVAC representative visited Noorvik he did some tests on the system and found that the vacuum pumps were running too many hours. The reason identified was the old plumbing controls that had not been replaced. Armed with this information, Noorvik worked with PHS to obtain \$200,000 to replace all the old toilet units and controls. This will greatly improve system operation and life of the pumps.

The direct result of his visit, of course, was hands-on training for the operators that was specific to the AIRVAC controls in their plant and in the homes they serve. Another tangible benefit from the training activity was that the alternate operator got his certification. This will garner Noorvik an additional 50 points when VSW evaluates its request for system upgrades. Fifty points would have put them over the top on last year's request for sanitation funding from VSW. Both the primary operator and the alternate are now certified for water and wastewater treatment.

In the course of drafting the new customer use agreement, the administrator realized that the water and sewer ordinance needed updating, so he will take that up next.

Long-Term Effects

Noorvik is on a roll. The city administrator said that since 1992 management and operations have been improving. Customers are more satisfied and there is better service being provided. It has been a while since the city has had to disconnect a customer. The city is willing to work with homeowners to set up a payment plan to clear up back debt and maintain service; as of September, five customers had used this option. While the O&M project did not start this improvement trend, it contributed a lot. The project not

only dramatically reduced maintenance problems in customers' homes, it also helped the city understand where it was with management and what it has done to get where it is now. He went on to say that Noorvik is always interested in sharing its experience with others and learning from others.

One of the long-term benefits from the project is that Noorvik is sharing what it learned: Noorvik is now mentoring a Phase III community on its O&M project. Noorvik is an excellent choice: the primary operator received the "Small Water System Operator of the Year" award for 1998.

Noorvik was a real success. The relatively small grant of \$11,818 leveraged much greater benefits in improved levels of service, customer relations, household O&M, operating efficiency, operator knowledge and skills, system maintenance, effective use of operator time, and financial self-sufficiency. In terms of the larger ANHB goals of protecting public health, protecting public investments, and building community capacity, however, the gains are modest, since Noorvik performed well in each of these dimensions before the project began.

NULATO

Nulato

Nulato (population 365) is located on the Yukon River in the Interior, 310 miles west of Fairbanks. Two thirds of homes are served by a new piped water and sewer system. The \$8 million project was constructed by VSW over three years; service began in the fall of 1996. A utility board appointed by the city council oversees the electric, solid waste and water and sewer utilities.

Utility finance is a major concern. Households are charged \$115 per month for service. If the collection rate is 70 percent, the annual deficit is projected to be \$39,000 to \$50,000 per year.

The two water operators from the old system were trained to operate and maintain the new water and sewer system. The primary operator now has eight years' experience and Level I certification in water treatment and wastewater treatment; his alternate has one year's experience and OIT certification. The operators work 38 hours per week, one week on and one week off. They are paid \$12 per hour with no benefits or retirement plan.

Detailed background information on Nulato, its water and sewer system, operations, maintenance, and management is provided in the First Year Report.⁷

Project Plan and Objectives

The purposes of the O&M project were expressed in a cover letter with the grant application:

Our goal is to implement an efficient O&M program that will allow us to do the following:

1. Meet the long-term water and sewer needs of the community at an affordable price
2. Keep O&M costs at a minimum by implementing a strong preventive maintenance program and eliminating unnecessary spending
3. Collect the maximum revenue possible through an efficient management and billing system and through quality service.
4. The partnership agreement contains a model work plan defining in detail the following general activities:
 - Provide training to the local utility board and the city council to help them understand the issues related to successful management of the water and sewer utilities.
 - Define the role of the utility manager. Recruit, hire and train the utility manager. Establish an administrative structure including general record keeping, payroll, accounts payable, financial reporting, and others.
 - Establish an effective billing and collections system for the utility.

⁷ Institute of Social and Economic Research, *Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program and Nine Community Pilot Projects: First Year Report*, prepared for U.S. Environmental Protection Agency, Region 10, January, 1997.

- Provide information to the community members, most of whom will be first-time users of piped water and sewer, on their role as utility users, the utility payment system, and the proper use and maintenance of the utility.
- Operator training and certification and preventive maintenance planning.
- Identify and purchase replacement equipment, spare parts and supplies.
- Project administration.

The work plan was later amended to drop the utility manager.

Project Implementation

The project began July 1, 1996, and, with a three quarter extension, ended March 31, 1998. Only \$24,458 of the \$32,800 grant was spent; it was matched with \$14,098 in local contributions.

The O&M project in Nulato started off very slowly. The project made very little progress in the whole first year. Joint council/utility board training was conducted in October 1996, followed by a few board meetings where little was done. Then activity ceased. Additional training was repeatedly postponed due to lack of interest or agreement about who was responsible for utility management. The local project manager had great difficulty finding people to serve on the utility board. Only after the new water and sewer system had been in operation for nearly a year and various problems had arisen, threatening its continued operation and services—which the community had come to enjoy—did interest in utility management and oversight pick up and the board revive. The mayor, city clerk, city treasurer and one city council member attended utility management training in December 1997, and found it to be very helpful, providing practical information and insight into what was needed for effective utility management. In the course of the training they realized that they had some basic issues to address regarding the city organization chart and personnel system: who is responsible for what?

The community education component showed a similar pattern. Early on there was no sense of direction for this activity. The homeowner's manuals passed out when the original hookups were made consisted of technical product information. From the very start, individuals who had not previously lived in homes with plumbing had a variety of practical problems with their plumbing, particularly with freeze-ups due to failure to use the heat tapes and failure to heat the home during extended absences. By November 1997, the new alternate operator was "starting to get stretched a little thin working on household water heater and toilet plumbing problems." It took almost a year of operation before it became evident to the board that the utility needed an easy-to-understand homeowner's manual for customers addressing the basics of operation and maintenance for their home units. In December 1997, the city hired a technical writer out of Anchorage to prepare a homeowner's manual. Following review by the city and VSW, it was printed and distributed to customers in April 1998. There was a very good response; people felt it was very useful. In addition, the city printed a community newsletter with some information on the costs of operating the system. In May 1998 interviews, the operators said the homeowners knew how to operate and maintain their home units.

The utility manager position was dropped from the plan because the city treasurer believed the city could not afford to support the position. The treasurer himself, who was project manager for the O&M grant, took on some of the utility management functions.

Though a variety of people helped with the implementation of the work plan—including the operators, the city clerk, the mayor, the council members who became utility board members, the RMW, the VSW project engineer, the RUBA, the ANHB project director, and others from TCC, DCRA, VSW and the community—it was not a true partnership in the sense that the plan itself was not jointly developed, monitored or evaluated. All project management and communications went through the city treasurer.

The city did purchase a new computer and software, which did improve the city's ability to maintain and track billing and collections. The operators and RMW did identify a critical spare parts list and the city purchased the parts with project funds, along with a variety of protective clothing, supplies and equipment for maintenance work.

The operators did get training. One of the operators became certified Level I in wastewater collection. The other operator received his OIT certificates in water treatment and water distribution. In addition, both operators received on-the-job training from the construction project mechanical foreman. They also attended a variety of workshops.

The operators worked on a preventive maintenance plan with the RMW, but found it difficult to implement. “Without a utility manager or a direct supervisor, there is still some confusion and misunderstanding regarding operator duties and responsibilities, and we aren't able to implement the preventive maintenance plan as well as we'd like, or in as organized a manner as is necessary.”⁸ Two examples were given of operators' failure to perform routine maintenance. A leaking water fountain was not fixed and the water was rotting the floor boards. Also, a sewage sump pump needed a shim to run properly; without it, the pump continued to run at low levels, damaging the pump and using a lot of electricity.

Confusion about who their supervisor was showed in the interviews: three operators gave three different answers as to whom they report—the mayor, the city treasurer, or the tribal administrator. This is amplified in a phone log in May 1996, when the operator was explaining his difficulty answering the ISER community survey question regarding who supervises the utility operators. “He said sometimes the city council, sometimes [illegible?], and sometimes no one. I explained we are trying to get information on how the utility runs from the operations through governance. He said it's a mystery.” Not having adequate supervision was clearly detrimental to the performance and morale of the operators.

Project Outcomes

With the exception of the utility manager position which was deleted, the project activities were largely accomplished. Unfortunately, there is no information in the record regarding actual collections or operating costs, so it is difficult to assess how well the larger objectives were achieved. In the project self-evaluation, the project manager wrote:

As a result of this program there is an increased awareness by the City Council about the need for effective utility management and for personnel management. We are still working on trying to implement a more effective utility management program.

⁸ Fourth Quarter Report written by the city treasurer. This same theme is restated in three of the reports.

The Nulato project was well-conceived and timely. With a new water and sewer system coming on line, the need to lay a sound foundation for on-going operations and finance was critical. The city treasurer who wrote the application and the work plan was ahead of the other community leaders in anticipating this need.⁹ Perhaps a more collaborative approach to developing the work plan would have brought the rest of the community on board sooner, and the project benefits would have been realized sooner. (Or perhaps not: perhaps a collaborative approach was not feasible sooner, because the other community leaders did not see it as a priority.)

The long lag time in project implementation warrants some discussion. My observation is that conceptualizing, planning and implementing a project not only takes time, but also motivation and context. Community leaders had to see for themselves the critical need for utility management and user-friendly education materials before they were motivated to act or had a clear sense of direction. It is a credit to ANHB's project management that it could flexibly adapt to the long lag time the community needed before it was ready to effectively use the project resources.

Long-Term Effects

Although it was written in May 1997, mid way through the project, I believe the following excerpt from a letter from the city treasurer fairly summarizes the final status of the project.

In general, our biggest problem so far has been the failure to designate a utility manager or someone to accept responsibility for management decisions. Without a utility manager, we are lacking a key ingredient necessary for effective management of our water/sewer utility. Unfortunately, our water/sewer utility is expected to operate at a deficit, and hiring a utility manager would seem to increase the projected deficit; the City Council has not yet figured out [how] to resolve this dilemma.

The successful long-term operation of our water/sewer utility presents a formidable challenge to the City; in some ways, we are still undecided about how to accept this challenge. On the positive side, the O&M Pilot Project has enabled us to address some of our training and O&M needs....

A note from the third quarter report adds, "One of our primary operators is seeking other employment. Lack of a utility manager or direct supervisor still creates some problems."

Learning is always a long-term investment in community capacity. Homeowner education and the development of an active utility board were important accomplishments of this project that will yield long-term benefits. Operator training and the new billing and collections software offer tangible improvements in community capacity for effective O&M and financial support of the system. The spare parts inventory starts the new system off with the basic resources for O&M.

⁹ The real credit goes to the tribal administrator, who anticipated this need and pushed the city to apply for the O&M grant.

Yet this may not be enough. It appears that community capacity is stretched too thin. The city treasurer cannot adequately cover the utility management responsibilities on top of his other duties. The city needs a utility manager but cannot afford to hire one. The system has a projected deficit of \$39,000 or more per year. In a community where the median household income (in 1990) was \$17,000, monthly fees of \$115 per month may be untenable. Shutting off service for nonpayment rends the community. Preventive maintenance is inadequate.

Operator morale is poor. The primary operator has upgraded his skills and taken on much greater responsibilities, not only for the two washeterias and the new sewer system, but also as an alternate for the power plant and maintenance on city buildings. (The most unpleasant and dangerous new job duty is going to homes to shut off service for nonpayment.) Yet he has not been given any increase in pay or hours, and he has no medical, retirement or disability benefits. The prior alternate operator had similar complaints and quit. The current alternate is not Level I certified.

This state of affairs is alarming in that Nulato is a community with good administrative resources and it has made every effort to “do it right:” it planned ahead for the new system, it passed a water and sewer ordinance, it signed customer service agreements, it levied one of the highest monthly service fees in the state, it enforces collections with service disconnects, it established and trained a utility board, it has a model community education program. The fundamental problem is economic. The fixed costs of operating and maintaining a small water and sewer system are nearly as large as for a large system, but the costs are spread over a much smaller customer base. While a careful analysis has not been done, it appears that a small rural community with a very small cash economy simply cannot support arctic design piped water and sewer. If there is to be a long-term solution to the problems of O&M in communities like Nulato, it will have to come in the form of a subsidy from outside the community.

Sleetmute

SLEETMUTE

Sleetmute

Sleetmute (population 102) is located on the upper Kuskokwim River, 79 miles east of Aniak and 166 miles northeast of Bethel. Utilities are operated by the village council. Nine HUD homes are plumbed, served with village water and individual septic tanks. A few other homes have private wells and septic systems, but the majority haul water from the central watering point and rely on pit latrines and honey buckets.

There are two wells: one at the water plant and one at the washeteria. Neither water source is treated. The distribution line to the HUD houses is noncirculating. One operator works five hours per week to operate and maintain the system.

Detailed background information on Sleetmute, its water and sewer system, operations, maintenance, and management is provided in the First Year Report.¹⁰

Project Plan and Objectives

The intent of the O&M project in Sleetmute was to improve the water and sanitation system in Sleetmute using a comprehensive approach. The partnership agreement work plan provided for the following activities:

- **Partnership Team.** The community of Sleetmute will form a partnership team that will coordinate to carry out the O&M pilot project activities. The team will include village council representatives, Sleetmute Vista, ANHB project officer, AVCP and YKHC representatives, and DCRA representatives.
- **Sewage Lagoon Road Repair.** The sewage lagoon is currently inaccessible due to poor conditions. This activity will provide for road improvements to access the lagoon. A road 1,200 feet long and 20 feet wide will be improved.
- **Sewage Lagoon Improvements.** The sewage lagoon is in need of improvement. This activity will be in the form of re-excavation of the lagoon.
- **Sludge Pumper Repair.** Repair site glass on pumper and purchase battery.
- **Septic Tank Maintenance and Sludge Removal and Dumping.** Pumping of all septic systems in Sleetmute and dumping sludge in the lagoon.
- **Water Well Improvements.** The pipe leading from the well to the house lacks sufficient insulation and is subject to freezing during winter. This will include minor maintenance to the pump room at the multi-building.
- **Survey of Community Sewage Disposal.** Survey the households in the community to determine the method of sewage disposal.
- **Operator Training.** Provide training for the water and sewer operator to obtain OIT certification.

¹⁰ Institute of Social and Economic Research, *Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program and Nine Community Pilot Projects: First Year Report*, prepared for U.S. Environmental Protection Agency, Region 10, January, 1997.

- **Operator Protective Clothing.** Provide protective clothing for the operator for pumping the sludge from the septic tanks and dumping of the sludge.
- **Utility Management.** Coordinate with DCRA to review the information from the management operation and maintenance of the sewer and water utility to adopt a sewer water ordinance and set rates

Project Implementation

The project began July 1, 1996, and with a three quarter extension (and much grace) officially ended August 31, 1998. Ninety percent of the \$32,311 grant was disbursed at the start of the project, with the remaining ten percent disbursed in July 1997; ANHB funds were matched with \$15,222 in local contributions.

A village council member (and Americorp employee) was initially the O&M grant manager for the community. The road project was the largest investment of time, energy and dollars. It was hampered by the wet summer, vehicle maintenance problems, and the lack of proper equipment: the caterpillar tractor was too small and the 966 loader too heavy.

Several people were actively involved in developing and carrying out the activities, including council members, the operator, and the RMW. Other outside resource people, such as RUBA and AVCP, were notably absent.

The road repair work, repairs to the sludge pumper, and improvements to the well water line and pump house were all completed in the first quarter. The first quarterly report was filed in October 1996. The sewage lagoon was re-excavated in the second quarter. (The operator went for training and passed his OIT, but ANHB funds did not pay for it.)

When the project manager moved to Aniak in November, the retiring council president took over project management. There was no further activity for several months. The intermission was largely due to disruption in leadership when the village council ceased functioning. Apparently there was turnover and an unfinished initiative to merge with the tribal council. The water plant operator position also turned over.

ANHB revived contact in April. The project manager—he was designated village council administrator at this point—reviewed the accounts and, on June 30, 1997, submitted three more quarterly reports along with a request for a one quarter extension and disbursement of the remaining \$3,231 in grant funds. This request was granted but was conditional on the city's revising the budget to show community match and revising the work plan to show how the activities would be completed. Communications were disrupted for several weeks when wildfires in the area disrupted telephone service, the village offices were taken over for the command center, and many village residents worked on fire crews. Meanwhile, the project manager was tied up with EPA regulatory actions regarding a permit for sludge disposal and drinking water violations. He did, however, manage to revise and submit the quarterly reports as requested. A telephone conversation with him stating Sleetmute's intent to complete the remaining activities—specifically, pumping the septic tanks, surveying waste water disposal, and conducting the rate study—was deemed sufficient to award the remaining funds.

Frustrated by his inability to establish contact by letter or phone, in March 1998, the ANHB project director visited Sleetmute again. He found a well-run tribal council office and very new staff, but no village council. The project manager was never located. The tribal council staff and traditional council leadership worked with the ANHB project director to piece together the financial record for the grant.

The ANHB project director had two reasons to try again to revive and finish the project: (1) the public health hazard; and (2) one way or another, the village was going to require outside assistance to resolve the problem. The septic tanks had not been pumped in six years; one home already had had sewage back up into it; besides the obvious public health problems, this could cause water damage.

Tribal council leaders recognized the need to complete the sludge pumping activity and cited three reasons why it had not been done the previous year. (1) The very busy fire season employed every available person; at the end of the fire season, residents needed to make up for lost time in subsistence activities (“grub comes first”); and with fire wages still in their pockets, they had little incentive to take work in the village. (2) The heavy equipment that was needed to haul the vacuum sludge pump unit was not working. (3) The project manager was not around to coordinate and assist with the effort.

There were five more months of contacts by phone and letter and partially explained delays. (One problem was that the office phones had been disconnected for nonpayment.) Finally, in late July 1998, an election was held to reconstitute the village council and, with assistance from the RMW, the sludge pumping proceeded. The former water operator, now serving on the traditional council, operated the machinery. While there were some follow-up contacts in September and October regarding close-out reporting, no final report was ever filed. No explanation, as requested repeatedly by ANHB, was ever received regarding the high benefit rates shown for employees in the early quarters of the project. The last evidence in the record showed that the project manager and some other members of the village council members were donating their time to try to follow up on past grants and put things in order and were training a new clerk to keep up with the bookkeeping and paperwork. The traditional council also had had staff turnover.

No formal activity was undertaken on the utility management task, although a cost analysis was performed in conjunction with the septic pumping activity and used to set rates. The ANHB project director had encouraged the village project manager to request RUBA assistance on the utility management activity and gave him a name and phone number to call, but no action was taken. The survey of sewage disposal and the purchase of protective clothing were not completed; the operator and council felt these were unnecessary.

Project Outcomes

What is referred to in the work plan as a sewage lagoon is really a disposal site for sludge pumped from the septic tanks. The site had not been used or maintained, so the fencing was in disrepair and the site needed re-excavation. The site is located on the same road as the dump site for solid waste. When the road became impassible, even by a four-

wheeler, people began dumping their solid waste at the sludge disposal site and along the road. The Kuskokwim Corporation and the village council jointly paid to repair the dump, while ANHB dollars rehabilitated the sludge disposal site and repaired the road. The whole area has been greatly improved: there is good road access to both, and the garbage that was strewn in the sludge disposal site and along the road has been cleaned up and deposited in the dump. The community was pleased with the improvement.

The RMW assisted with pumper repairs—all minor—and pumping the septic tanks. He reported that the tanks—which had never been pumped before—were so full of sludge that their function was compromised, and they would not have made it through another season without maintenance. So the project was very timely.

The only piece of equipment in the village powerful enough to pull the loaded pumper was the 966 loader. The pumper has a 500 gallon capacity, so the 1,250-gallon septic tanks required two trips each. Each trip to the disposal site took 30 to 40 minutes. The council normally charges \$100 to \$125 per hour for the loader, plus fuel, which costs \$3.00 to \$3.50 per gallon, plus operator time. All tolled, pumping the septic tanks was a fairly expensive operation. One of the benefits of this exercise was that the village council obtained a very good assessment of the costs of maintaining the septic tanks. This is important for cost projections and fee setting. The school wants to hire the village to pump its 5,000 gallon tank, and the council president is advocating that the village charge for pumping services in the future. Fees are charged for water service—\$20 per month for piped and \$10 for watering point—and billing and collections run smoothly. The collection rate is about 90 percent.

Insulating the well head and the pipe into the well house saved the village as much as \$200 per month in electric bills for operating heat tape in the winter months. This very small investment had a very large payoff.

Long Term Effects

While it is clear that the project—and persistence by ANHB—narrowly averted a public health disaster, and that substantial improvements were realized in solid waste disposal, long-term improvements are less clear. Certainly the cost savings from insulation are long-term. It is possible that residents will remember that the tanks need to be pumped every few years. There is no reason to expect that the road will be maintained.