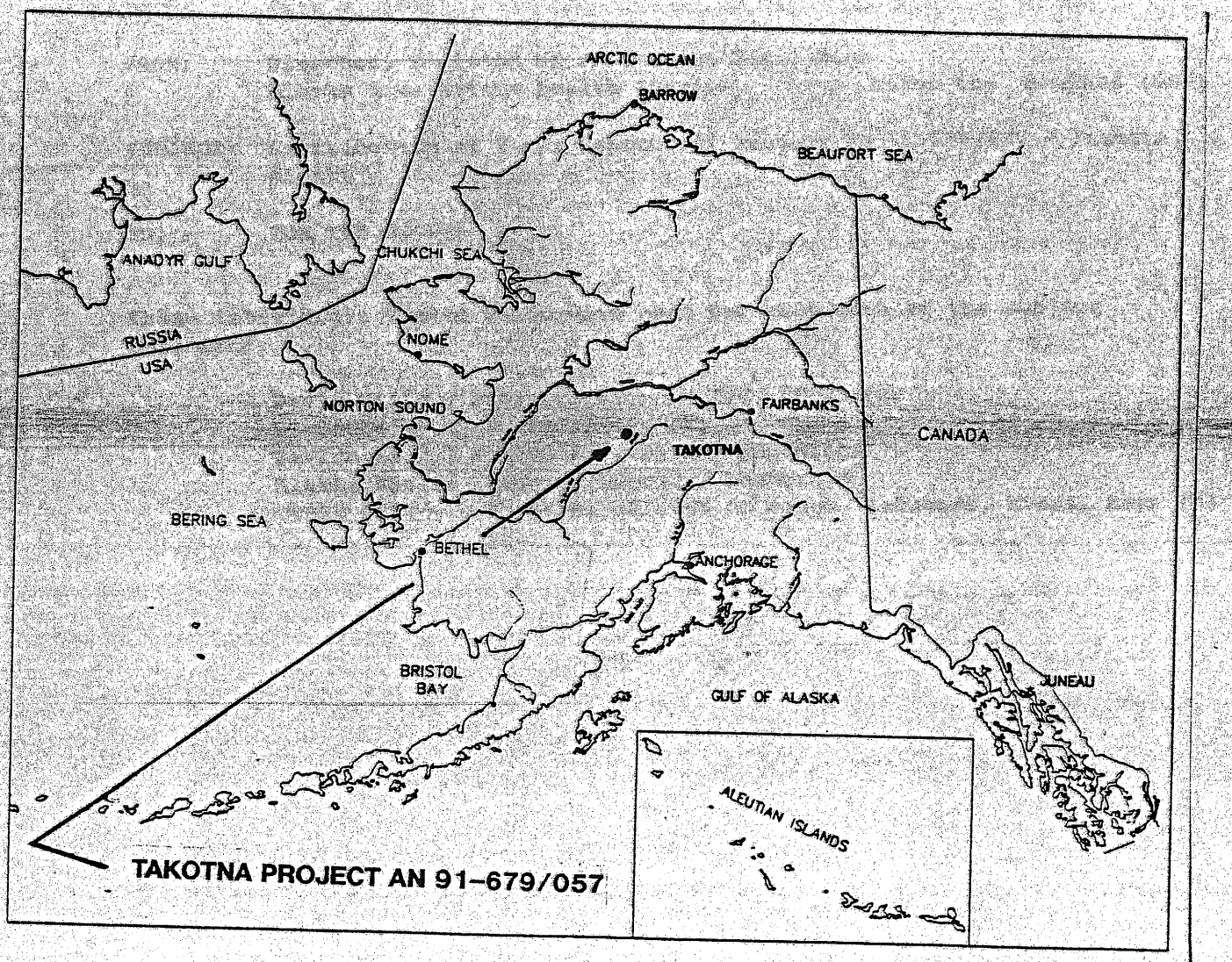
FINAL REPORT
SANITATION FACILITIES CONSTRUCTION
FOR
TAKOTNA, ALASKA

PROJECT AN 91-679/057



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
ALASKA AREA NATIVE HEALTH SERVICE
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
ANCHORAGE, ALASKA
FEBRUARY 1995

SANITATION FACILITIES CONSTRUCTION
FOR THE
VILLAGE OF TAKOTNA, ALASKA

PROJECT NO. AN 91-679/057
PUBLIC LAW 86-121

DATE OF REPORT
February 1995

INTRODUCTION

Because unsafe water supplies and waste water disposal practices have been implicated as causative factors in significantly high rates of infectious disease among American Indians and Alaska Natives, the Indian Health Service (IHS) of the U.S. Public Health Service (USPHS) has been authorized, under Public Law 86-121 to plan, fund and construct sanitation facilities in Alaska Native communities in support of federally sponsored housing projects or existing Native owned housing. Funding was provided by the IHS under the provisions of Public Law 86-121. Engineering and technical supervision were provided by the IHS and construction was performed by force account using local labor.

The Village Council, on behalf of the residents of Takotna, Alaska, requested assistance from the IHS, through the Tanana Chiefs Conference (TCC) in improving sanitation facilities for the Native residents of Takotna, Alaska. Since the last IHS project in Takotna, AN 79-170, there had been eight houses locally constructed or that have had significant renovations.

The Project provided; a new water intake/pumping facility, a new water transmission line, a total rehabilitation of the Water Treatment Plant (WTP)/Washeteria and a new septic/drainfield system.

This Final Report contains planning, design, and construction information, costs for construction, and operation and maintenance (O&M) information for the sanitation facilities. The total cost of the project was $637,000 and provided community water and community waste water improvements that improved community-wide service for the entire community.

GENERAL INFORMATION

Takotna is located on the north bank of the Takotna River in the Kilbuck-Kuskokwim Mountains, 14 miles west of McGrath and the Village is approximately 240 miles northwest of Anchorage. The 1990 U.S.Census data for Takotna lists 38 residents.

Takotna is an unincorporated Village, and is part of the IHS's Interior Service Unit.

A more detailed description of the location, climate, transportation, population, government, housing, public facilities, and economy for Takotna is available in the General Information Section of the Project Summary (PS), Project No. AN 91-679/057 prepared for this project and appended in the Engineering Report section.

HISTORY OF PROJECTS

The Village of Takotna and IHS have cooperated in the construction of one previous Public Law 86-121 project.

Project AN 79-170 was approved in June 1979 and provided the Village with a watering point/washeteria, 11,000-gallon water storage tank, pump house and river intake/fill line, five sewage disposal bunkers, and septic tank/drainfield system for the washeteria.

PROJECT PLANING AND DESIGN EXPERIENCE

This project was initiated from a proposal submitted to IHS in November 1990, from the TCC. In the proposal it described the problem of the location of the water intake structure and its proximity to the existing drain field, problems with the septic tanks and, the washeteria was in need of rehabilitation.

Initial project planning began in the November 1989. In conjunction with the TCC, the IHS planned for the construction of a permanent water intake structure in Gold Run Creek. A scope of work was developed for this project consisting of five parts. They were: (1) to install a 4-inch arctic P.E. water transmission line and water intake structure; (2) upgrade WTP appurtenances; (3) rehabilitate the washeteria, restrooms, washers, and dryers); (4) construct an alternate drain field; and, (5) relocate original septic tanks and replace them with new septic tank so that the tanks were no longer in the road. The Project Summary was approved in September 1991, and the Memorandum of Agreement was executed in September 1991. In June 1991 IHS personnel visited Takotna to meet with the Village Council, and discuss the infiltration gallery alternatives and to collect additional design information. The option chosen moved the intake structure upstream from the existing structure and included a gravity fed transmission line with a return back to the stream for the excess water via an existing water line. A final design review meeting was held on March 6, 1992 and the plans were stamped in early May 1992. All permits were approved by September 1992 with no significant problem. Design of the project was straight forward with no significant problems found during the design phase.

Application for the following permits were completed: 1) U.S. Corps of Engineers Permit to Construct in a Wetland; 2) (Dept. of Environmental Conservation, DEC) Plan Approval and Wastewater Discharge Permits; 3) Water Rights Application; 4) Coastal Zone Management Ouestionaire (OMB).

Several historic sites were listed in the Alaska Heritage Resource Study dating back to the 1900's. All construction was centered some distance away from any known historic sites. No historical remnants or evidence was found in or around the project area.

The Final Transfer Amendment No.1 allowed for the IHS to make an additional contribution to the project in order to complete the Final Inspection Punch List and close out the project accounts. The project was transferred to the Village at the time of the Final Inspection. An additional contribution of $160,000 was required to address the following project cost overruns of air freight, added difficulty in construction of the infiltration gallery, septic system and additional items that were requested by the community.

PROJECT CONSTRUCTION EXPERIENCE

Project work began during the summer of 1992. The bulk of the project materials were flown to the site. Barge transportation in the late summer months on the Upper Kuskokwim is undependable given lowered water levels. Construction began with the installation of a infiltration gallery and arctic water transmission line. Work did not prove to be difficult but production was slowed due to initial site difficulties. The initial site selected was found to be unusable due to proximity of bedrock to the bottom of the stream bed. Several additional sites were explored due to the variable nature of the gravel and silts laid down by the creek. The site selected was located in an area with minimal silt. The water intake structure was changed from the stream bed to an off set structure approximately 10 feet from the stream bed. This was done because the gravelly soil encountered allowed for a more effective infiltration gallery.

During the installation of the new drain field, the old field failed causing problems until the new field was on line. While constructing the new field, clay was encountered at the site. It was found that the location for the new septic tanks were unsuitable, with no acceptable room around the WTP/washeteria it was decided to move an existing washeteria fuel tank and consolidate it with other fuel tanks at one location freeing room for the septic tank installation. The drain field located at the base of hill required substantial site preparation and extensive retracing of the hillside. Additional costs were incurred during the construction of a temporary watering point and shower that was installed at the request of the Village and the Tanana Chiefs Conference. The WTP/washeteria building during the project was found to have racked slightly and was

in need of a new roof. The building was stabilized and a new roof was installed.

At the time of the Iditarod race in 1992 the water at the WTP was deemed unsafe by the Alaska Department of Environmental Conservation (ADEC) with high levels of tetrachloroethylene (TCE). Upon discovery of the contamination problem with the water storage tank and prior to isolating the source, IHS personnel were dispatched on an emergency trip to install temporary in-line charcoal/micron filters to process the water to meet state standards. The cause of this was found to be a silicone sealant used on the existing water tanks in the WTP. Since the tank had corrosion problems it was deemed more economical to replace the water tank. As a result a new bolted steel water storage tank was installed.

Upon completion of this project the community had a facility that is up to code and meets all state and federal standards.

TABLE I - CHRONOLOGY OF EVENTS

ACTIVITY	DATE
IHS PROJECT AN 91-679/057	
Takotna's Request for Assistance	August 1990
Project Proposal Submitted from TCC	August 1990
Design Initiated	August 1991
Project Summary Approved	September 1991
Memorandum of Agreement Executed	October 1991
Construction Started	June 1992
ADEC Operational Permit Issued	June 1992
Transfer Agreement Amendment No.1	October 1992
Transfer Agreement	August 1993
Punch List Certified Complete	October 1993
Construction Completed	May 1993
Final Inspection Completed	July 1993
Warranty Inspection	November 1994

SUMMARY OF FACILITIES INSTALLED

Project AN 91-679/057 provided the community of Takotna with water and sewer system improvements.

Community Water

a. The project provided to the Village a water infiltration gallery. The infiltration gallery consisted of a 4-feet diameter by 17 feet perforated aluminum culvert with casing, well screen, 1.5 HP submersible pump, electrical transmission line and controls.

b. A "Drain Back" type water transmission line consisting of approximately 400 feet of 4-inch arctic HDPE water transmission line to the Water Treatment Plant (WTP). This line has been heat traced with 5 watt/foot self-limiting, 230-volt heat trace in its entire length.

c. A Fuel Storage Tank Farm Berm structure and liner was completed with donated Village equipment and labor, and is the site for Village fuel and gas, washeteria fuel and generator plant bulk storage.

d. The project provided to the Village a 11,000 gallon bolted steel water tank.

e. The project provided to the Village a replacement metal roofing system for the WTP.

f. The project provided to the Village a complete replacement of all electrical wiring, fixtures, and controls in the WTP.

g. The project replaced the hot water boilers with new fuel oil fired hot water boilers, in the WTP.

h. The project provided the replacement of the hydropneumatic tanks in the WTP.

I. The project provided the rehabilitation of the interior and exterior of the WTP/Washeteria.

Community Wastewater and Individual Septic Systems

a. The project provided to the Village a complete Septic Tank and Drain field System consisting of a 3,000 gallon Septic Tank and an approximate 1,100 feet alternating infiltrator bed drain field system. A diverter valve was installed to provide for selection of either half of the drain field.

Miscellaneous

a. The project provided to the Village one used Chevrolet model R30 crew cab pickup truck, one fire pump powered with 11 hp Briggs and Stratton gas engine.

b. The project provided a complete set of hand tools, miscellaneous piping and plumbing materials, safety equipment, spare pumps and electrical controls and water testing equipment.

For a completed list of items provided to the community see the Transfer Agreement for this project contained in the Appendix of this report.

CONTRIBUTIONS

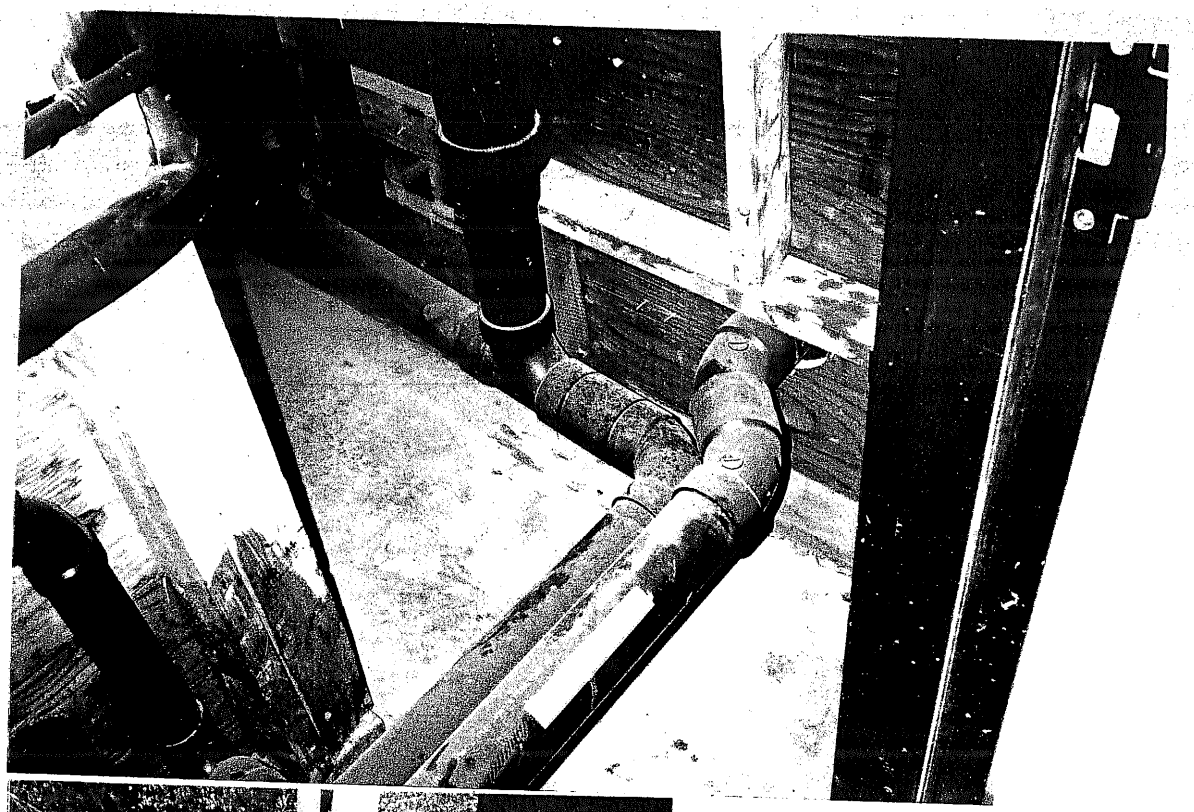
The Village provided an in-kind donation of equipment and labor, to complete the removal and relocation of the Fuel Storage Tank Farm and enclosure system. The IHS estimated value of the in-kind donation was valued at $15,000.

TABLE II - SUMMARY OF PROJECT FUNDING

DESCRIPTION	AMOUNT
FUNDS ALLOCATED	
IHS PROJECT AN 91-679/057	
ORIGINAL PROJECT SUMMARY (PS)	
IHS REGULAR FUNDS	$250,000
IHS HOUSING FUNDS	$227,000
TRANSFER AGREEMENT (TA) AMD No. 1	
ADD IHS HOUSING FUNDS	$160,000
SUBTOTAL- IHS PROJECT AN 91-679/057	$637,000
TOTAL FUNDS ALLOCATED	$637,000

FINAL REPORT FOR PROJECT AN 91-674/057 - TAKOTNA

The new fresh water intake on Gold Run Creek proved to be a construction challenge.



WTP sewer lines connect
to septic tank near the building.

FINAL REPORT FOR PROJECT AN 91-677/057 - TAKOTNA

Arctic transmission lines from water intake to WTP are placed into position.