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Asbestos Exposure – Ambler Public Health Evaluation and Assessment Interim Report

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Introduction

Many individuals, agencies, and stakeholders have been working together to evaluate the significance of the discovery in the fall of 2003 of naturally occurring asbestos in the gravel pit at Ambler. Several meetings have been hosted by the Northwest Arctic Borough to share information and identify steps needed to develop recommendations for the community.

Public Health Findings

The Alaska Division of Public Health has been working with the Maniilaq Health Center, Maniilaq Association, the Alaska Native Tribal Health Consortium, and several national asbestos experts to obtain information on the medical and public health significance of the presence of asbestos in Ambler.

Inhalation of asbestos fibers is the primary route of human exposure. The likelihood of developing asbestos-related diseases is related to the length of exposure and the concentration of asbestos.

We performed a medical records search to determine if any asbestos-related diseases have ever been identified in residents of Ambler, Kobuk, Shungnak, and Kiana.

- We reviewed all death certificates from 1980 to the present to see if there were any residents of Maniilaq villages who had died with any asbestos-related diagnosis. There were no residents with any asbestos-related diagnoses on the death certificate.
- We reviewed the State Cancer Registry and the Alaska Native Tumor Registry to see if there were any asbestos-related cancers that had been diagnosed and reported from any residents of Ambler, Kobuk, Shungnak, and Kiana. There were no residents who had been diagnosed with mesothelioma from any of these villages dating back to 1970. There were no reported cases of lung cancer from Ambler, Kobuk, or Shungnak dating back to 1970. There were 5 reported cases of lung cancer, all from the village of Kiana. These 5 cases occurred from 1984 to 2003, and they included 4 different cell types of lung cancer.

- We reviewed computerized medical records in the RPMS medical record system. There were no residents of the 4 villages who ever had been diagnosed with any asbestos-related disease.
- We reviewed existing chest x-rays from 128 residents from the 4 villages who were 50 years and older – 28 of these residents were from Ambler. Because of the past epidemics of tuberculosis and other common pulmonary diseases, there were many abnormalities. An expert, certified nationally as a chest x-ray reader for asbestos-related disease, reviewed these x-rays on behalf of the Maniilaq Association and the Alaska Division of Public Health.
 - Of the 28 residents of Ambler whose chest x-rays were reviewed, 2 had pleural changes that were probably caused by prior exposure to asbestos.
 - Of the 100 residents of Kobuk, Shungnak, and Kiana whose chest x-rays were reviewed, 7 had pleural changes that might have been caused by prior exposure to asbestos.
 - The asbestos-related changes were in the form of pleural plaques, and their appearance suggests that they were due to asbestos exposure many years ago, possibly due to occupational exposure.
- After receiving the information from reading the chest x-rays, a medical epidemiologist from the Section of Epidemiology visited Maniilaq, reviewed all available medical records, and with the help of a local interpreter, interviewed the patients who were still living and who agreed to be interviewed.
 - Several of the residents described past employment working in mines.
 - Many of the residents worked in mining many years ago, and they were unable to provide detailed information that would enable specific characterization of exposure to asbestos.
 - Of the 9 people with pleural plaques suspicious for asbestos exposure, 1 recalled working in an asbestos mine, 1 worked with asbestos as a construction worker, 1 was repeatedly exposed to high levels of mine dust while washing her husband's clothing, 1 refused interview, 2 had other medical conditions not-related to asbestos that definitively explained the x-ray findings, and the results for the remaining 3 were inconclusive because they had non-asbestos related lung diseases but these diseases did not definitively account for the x-ray changes.
- There are no medical tests to determine the amount of asbestos a person has been exposed to during their lifetime.
- There are no medical tests that are uniquely specific to identifying asbestos-related disease, but general clinical tests of lung function and chest x-rays are used to diagnose the disease and its impact. It is particularly difficult to identify mild cases.
- Persons who are exposed to asbestos have a greatly increased risk of developing asbestos-related disease if they smoke tobacco.

Asbestos Deposits in the Kobuk River Area

- Asbestos has been documented to be naturally present in the Kobuk valley for at least one century, and archaeologists have evidence that asbestos has been used by Alaska Natives for hundreds of years.

- Twelve asbestos deposits have been identified in the Ambler/Shungnak/Kobuk area.
- Asbestos mining occurred near Shungnak in the 1940s. Approximately 45 tons of tremolite asbestos was mined from Asbestos Mountain near the head of Dahl Creek in the 1940s.
- Approximately one ton of chrysotile asbestos was removed near Dahl Creek in 1945.
- Limited development of asbestos deposits on Bismark Mountain, Jade Mountain, and Cosmos Creek also occurred in the 1940s.
- Local Alaska Natives were employed to mine and develop these asbestos deposits in the 1940s.

Environmental Sampling Near Ambler

Since the discovery of naturally occurring asbestos in the Ambler gravel pit during the fall of 2003, several sampling efforts have occurred (Table 1). Gravel from the Ambler gravel pit has been used throughout Ambler for roads, housing and building pads, and the airport runway for 30 to 40 years.

- The unprocessed soil from the easternmost portion of the gravel pit contains trace amounts of asbestos (<1%). The sieved processed soil remaining in the gravel pit contains 5% to 10% asbestos. Pure chrysotile asbestos has also been identified in the gravel pit.
- Chrysotile asbestos has been detected in air samples within the school at 0.01 fibers/cubic centimeter. For comparison, the OSHA standard based on an 8-hour time weighted average is 0.1 fibers/cubic centimeter.
- Asbestos concentrations ranged from trace amounts (<1%) to 5% in samples of gravel used for construction that came from the Ambler gravel pit.
- Chrysotile asbestos was found in soil used to cover the gravel at the new Ambler school, although in very low levels.
- Asbestos was not detected in three ambient air samples collected last year near the road in Ambler.
- In an effort to locate a new, asbestos-free gravel pit site, the Alaska Department of Transportation and Public Facilities investigated 7 candidate material sites adjacent to the Ambler and Kobuk Rivers over an approximately 10 mile area. Of the 40 soil samples collected from the proposed new material site, 17 contained trace amounts (<1%) of asbestos. Of the 30 samples collected from the other 6 candidate sites, 12 samples contained trace amounts to 1% asbestos.

Planned Construction Activities

- Several major construction projects important to the village have been on hold until the extent of asbestos could be determined and its significance assessed:
 - Runway repairs at the airport
 - New sewage lagoon
 - New washeteria with underground piping to the new sewage lagoon
- The Alaska Native Tribal Health Consortium (ANTHC) engineers are proceeding with construction planning, including provisions to protect workers from asbestos exposure in accordance with Occupational Safety and Health Administration (OSHA) requirements.

- Based upon the characteristics of the planned construction projects, ANTHC believes that all of the construction projects can be accomplished within OSHA standards for worker protection.

Summary and Public Health Recommendations

- Additional public health medical record and chest x-ray reviews will be needed, but they will not provide much additional information to assist in deciding on construction this summer.
- There would be minimal increase in risk to residents from marginal exposure to asbestos as a result of any of the proposed construction activities if they were to proceed this summer. The asbestos that is present has been present for decades, and now that it is known to be present, construction projects can take precautions to minimize airborne dust and worker exposure can be controlled to OSHA standards.
- Deferring the construction projects carries risks to the community. The community needs to have a sound airport runway, a functioning sewage lagoon, and a working water and sewer system.
- With use of personal air monitors, worker safety and health can be protected if the proposed construction proceeds.
- Ambient air monitoring during construction will enable monitoring of community exposures.
- Additional soil testing in Ambler is essential to determine if asbestos is present other than from past use of gravel from the Ambler gravel pit.
- Soil testing in Kobuk, Shungnak, and Kiana should be done to determine if asbestos is present in the villages.
- Given the long history of use of gravel from the gravel pit, it is unlikely that Ambler will ever be asbestos-free in the future. However, the low concentrations of asbestos to which the residents will be exposed are unlikely to pose a significant threat to the public's health. The Alaska Division of Public Health will continue to assist the community to assess the extent of past, present, and future health hazards and, if necessary, develop practical risk management approaches.

Table 1. Recent Sampling for Asbestos In the Ambler area.

Agency	Year	Sample location	Number of samples	Amount of asbestos
Alaska Department of Transportation and Public Facilities	2003	Ambler gravel pit	3	1 to 10%
Department of Labor and Workforce Development	2003	Under school-original soil	2	not detected
		Near school from gravel originating from the gravel pit	3	< 1%
		Gravel pit	2	<1%
		Gravel pit	1	pure chrysotile mineral
		Wipe samples inside of school	3	asbestos detected
		Air sample	1	0.01 fibers/cc
NANA (prepared by Stevens Exploration Management Corp.)	2004	Ambler gravel pit	visual examination of screened reject	5 to 10 % asbestos
		Gravel pit-easternmost portion	3	<1%
Alaska Native Tribal Health Consortium	2004	Lagoon test hole	2 composite	not detected
		Sand/gravel from the Redstone Ave stockpile,WTP and washeteria pad, and lift station	3	0.75% to 5%
		WTP and washeteria pad	1 composite	1.7%
		Ambler borrow pit	1 composite	1.46%
Alaska Department of Environmental Conservation	2004	Air samples collected July and August for Total Suspended Particulates (TSP)	The 3 filters with the highest TSP	not detected
		Soil sample from the school yard	1	asbestos detected
Alaska Department of Transportation and Public Facilities	2005	Seven material sites were investigated	Proposed site-40 samples	17/40 samples-asbestos detected at <1%
			Six other sites-five samples each	12/30 samples-asbestos detected <1% to 1%