START 3

Superfund Technical Assessment and Response Team 3 - Region 8

United States
Environmental Protection Agency
Contract No. EP-W-05-050

TARGETED BROWNFIELDS ASSESSMENT

EKWOK VILLAGE POTENTIAL BROWNFIELDS INVENTORY
Ekwok, Alaska

TDD No. 0606-0003 Ekwok Village

Contact Dec, Brownfields Coordinator, 451-2166 for more info.

July 2007

URS
OPERATING SERVICES, INC.

In association with:
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TN & Associates, Inc.
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EKWOK VILLAGE POTENTIAL BROWNFIELDS INVENTORY
TARGETED BROWNFIELDS ASSESSMENT
EKWOK, ALASKA

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Region VIII START3 Contractor

Contract No. EP-W-05-050
Task Order 0606-0003 Ekwok Village

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July 2007

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ACRONYMS AND ABBREVIATIONS

AEA	Alaska Energy Authority
AIDEA	Alaska Industrial Development and Export Authority
ANTHC	Alaska Native Tribal Health Consortium
ATVs	all terrain vehicles
bgs	below ground surface
DCCED	Alaska Department of Commerce, Community and Economic Development
DEC	Alaska Department of Environmental Conservation
DEHE	Alaska Department of Environmental Health and Engineering
DHHS	United States Department of Health and Human Services
DOT&PF	Alaska Department of Transportation and Public Facilities
EPA	United States Environmental Protection Agency
FAA	Federal Aviation Administration
HUD	United States Department of Housing and Urban Development
IHS	Indian Health Services
M	million
PCB	polychlorinated biphenyl
SWMP	solid waste management plan
TBA	Targeted Brownfields Assessment
URS	URS Corporation or URS Operating Services
US	United States
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VSW	Village Safe Water

1.0 INTRODUCTION

This Targeted Brownfields Assessment (TBA) inventory was conducted as part of the United States (US) Environmental Protection Agency (EPA) Brownfields Economic Redevelopment Initiative. This initiative is designed to empower states, cities, tribes, communities, and other stakeholders in economic redevelopment to work together in a timely manner to prevent, assess, safely clean up, in the sustainable reuse of Brownfields sites (USEPA 2002). The specific scope of services for this TBA site inventory is detailed in contract number EP-W-05-050, Technical Deliverable Document 0606-0003 Ekwok Village between EPA Region 8 and URS Operative Services, Inc. This task order authorizes URS Operating Services, Inc., (URS) to conduct an inventory of Brownfields sites in the Village of Ekwok, Alaska.

The City of Ekwok, Alaska submitted a **Targeted Brownfields Site Assessment** Questionnaire to the EPA in February 2006. The City of Ekwok was interested in a community-wide assessment and inventory of a variety of environmental conditions in order to create an inventory of sites that may qualify for funding under the Brownfields program.

The following five sites were identified in the questionnaire:

- City of Ekwok old bulk fuel storage tanks;
- Private home dumps;
- Old community dump;
- Existing community dump; and
- Chemicals and fluids associated with abandoned equipment and vehicles at various locations.

1.1 PURPOSE OF PROJECT

The purpose of this TBA inventory is to develop an understanding of the existing conditions at Ekwok, to assess areas identified by the community in the Targeted Brownfields Site Assessment Questionnaire, and to identify potential redevelopment sites that may qualify for funding under the EPA Brownfields Program.

1.2 COMMUNITY BACKGROUND

Ekwok is Yup'ik Eskimo village located on the Nushagak River, 43 miles northeast of Dillingham. The community is classified as a Second Class City, is located within an unconsolidated borough, and has a population of 118, based on 2005 census estimates. The community of Ekwok is represented by several entities, including the City of Ekwok, the Village of Ekwok, the Ekwok Village Corporation, and the Bristol Bay Regional Corporation (Alaska Division of Commerce, 2006a).

Nearly the entire population of Ekwok depends on a subsistence lifestyle. Primary local subsistence resources include salmon, moose, local berries, and to a limited extent, caribou (Alaska Division of Commerce, 2006a).

Access to Ekwok is primarily by air. The State of Alaska, Department of Transportation and Public Facilities (DOT&PF) owns and operates a gravel airport runway, and floatplanes land on the Nushagak River. Most flights are chartered, or regularly scheduled small commuter flights from Dillingham. River travel is also a common mode of transportation, and Ekwok receives most of its cargo by barge between June and November, when the Nushagak River is ice-free. Local residents also utilize small boats for regional travel. When the river is frozen, residents travel along the river corridor by snowmobiles and all terrain vehicles (ATVs). (Alaska Division of Commerce, 2006a)

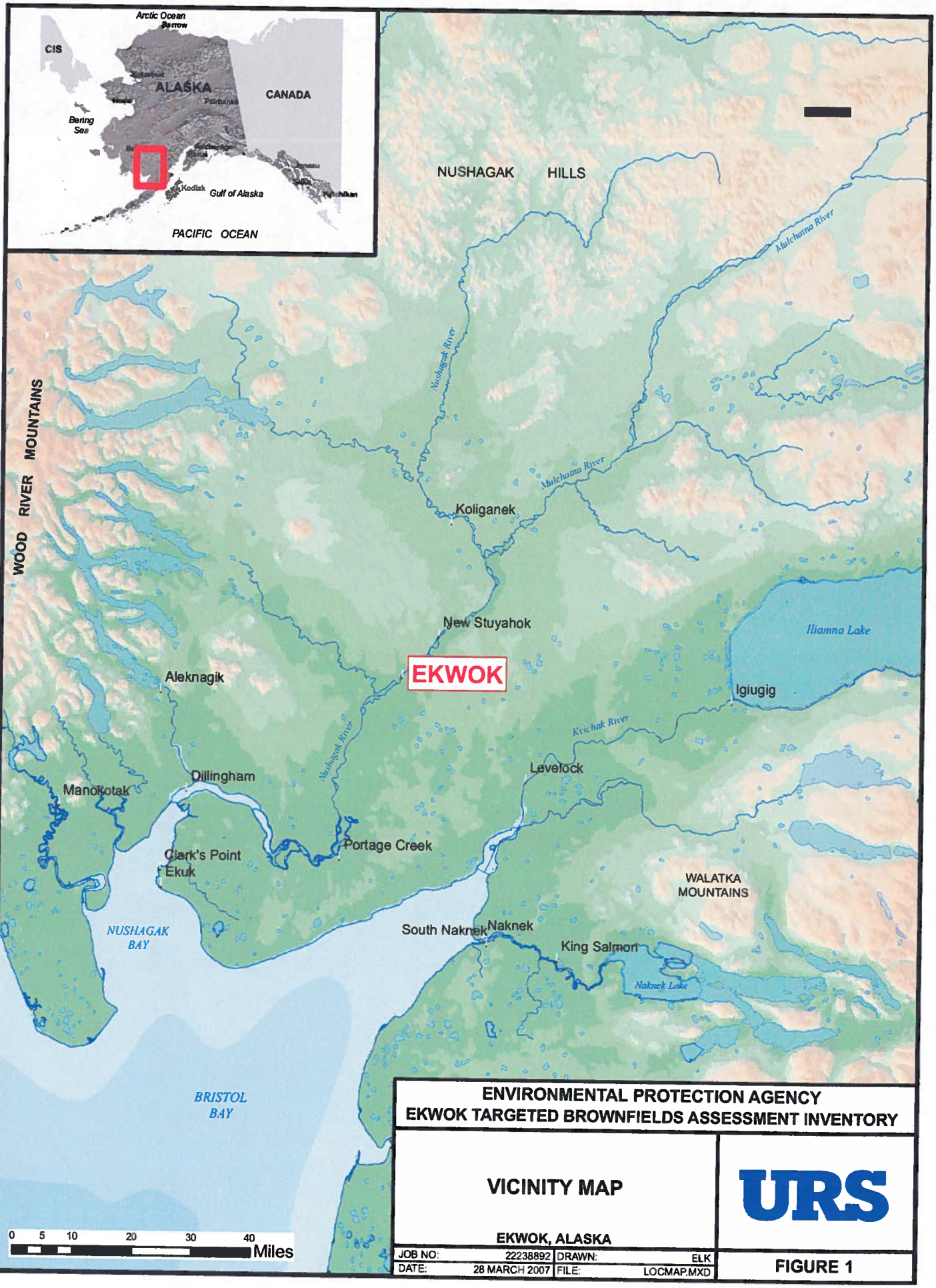
1.3 REGIONAL SETTING

1.3.1 Geology

Ekwok is located within the Nushagak River drainage area. The area is bounded by Bristol Bay to the south-southwest, the Wood River Mountains to the west, and the Nushagak Hills to the north (Figure 1). The geology for Ekwok is very similar to that of Dillingham and most of the Nushagak River basin. The rolling hills and irregularly shaped **moraine** knolls and ridges, with flat wetlands and muskegs between, are typical surface features of areas once covered by **continental glaciers** (United States Geological Survey [USGS], 1994). The last glaciers retreated from the area during the **Pleistocene** (approximately 10,000 to 25,000 years ago). The soil is generally acidic, and ranges from poorly to well-drained depending on location on hill slopes or flat lands. Regionally, the unconsolidated soil is generally gravel, sand, and silt with clay (Department of Interior, Geologic Survey, 1938).

1.3.2 Hydrogeology and Groundwater Use

Shallow groundwater in the vicinity of Ekwok occurs in multiple aquifers separated by units of clay and silt material (USGS, 1994). The upper aquifer is unconfined, and ranges in depth from approximately three to 60 feet below ground surface (bgs), depending on local topography. Groundwater quality in the upper aquifer is generally high, with good clarity and taste. Flow in the upper aquifer is generally toward the Nushagak River with minor local variability. A deeper confined aquifer occurring at depths between 65 to 80 feet bgs contain high amounts of iron, manganese, and sulfur, giving the water poor taste and causing brown staining (Paug-Vik 2006). Domestic wells in the community tap into both the shallow **unconfined aquifer** and underlying **confined aquifer**; however, because of the higher quality of the upper aquifer water, that is generally the preferred source of drinking water. (State of Alaska, Department of Environmental Conservation [DEC], Village Safe Water Program [VSW], 2006).



ENVIRONMENTAL PROTECTION AGENCY
EKWOK TARGETED BROWNFIELDS ASSESSMENT INVENTORY

VICINITY MAP

EKWOK, ALASKA

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FIGURE 1

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1.3.3 Surface Hydrology

The primary surface water body in the area, the Nushagak River, is roughly 280 miles in length, and flows generally north-south, from the Alaska Range (Nushagak Hills), to Nushagak Bay, which is an inlet of Bristol Bay. Several creeks near Ekwok drain into the Nushagak River, the largest being Klutuk Creek, located west-northwest of the town site. The Nushagak River and its tributaries are important migration and spawning areas for five species of salmon (King, Silver, Red, Chum, and Pink) (Wikipedia, 2006). The Nushagak River is home to the largest run of Red Salmon in Alaska, a vitally important species to the Bristol Bay fisheries (Alaska Chamber of Commerce, Dillingham, 2006). According to local residents, the Nushagak River floods Ekwok approximately every two to three years.

1.4 ECONOMIC CONDITIONS

Unemployment within the community of Ekwok is relatively high. The local economy is based more on a bartering system than on cash currency. Though located within the Bristol Bay region that is known for a productive commercial fishery, little commercial fishing occurs near Ekwok. Only six commercial fishing permits are held by Ekwok residents. Other commercial enterprises in the immediate area include two sport fishing lodges located downriver from the village that are owned by the Ekwok Village Corporation, and a small commercial gravel pit near town (Alaska Division of Commerce, 2006a).

Ekwok was listed as a **distressed community** by the **Denali Commission** in 2005, but not in 2006. Listing of a community as distressed is based on the per capita income, poverty rate, and unemployment rate. Under the guidelines for the Denali Commission, distressed communities receive higher priority for funding from that source than communities not listed as distressed (Denali Commission, 2006).

Approximately twenty United States Department of Housing and Urban Development (HUD) homes have been constructed in Ekwok in recent years, each with its own drinking water well and piped septic system. The City of Ekwok operates a piped sewage system with lift station for 10 to 16 residents. (Alaska Division of Commerce, 2006a; VSW, 2006)

1.4.1 Recent Grants for Community Development

This following list of grants for community development projects in Ekwok was taken from the Alaska Capital Project Database (Alaska Division of Commerce, 2006b):

- From 2002 through 2006, HUD funded approximately $417,000 for administration, operation, and construction of Indian housing.
- In 2005, DEC provided $400,000 toward new well and septic tank improvements and onsite septic systems. The overall project cost was estimated at $1.6 million (M).
- The Federal Aviation Administration (FAA) funded airport runway improvements and construction, totaling $6.5M.

- In 2003, DOT&PF provided $258,000 toward a total of $4.1M project cost for airport improvements, including extension of the existing gravel airport runway, and safety improvements.
- In 2003, a $25,000 matching grant from the State of Alaska was used for a community power plant upgrade and capital improvements.

1.5 COMMUNITY WASTE MANAGEMENT

In December 2005, the Village of Ekwok Environmental Department worked with middle school students from the William 'Sonny' Nelson School, to complete a house-to-house survey of used oil drums located on private property in Ekwok. Twenty-six households participated in the survey. As part of the survey, residents were also asked about waste management concerns and environmental problems they see in Ekwok. A copy of the survey report and the blank questionnaire are included as Appendix C to this report. A few notable results of the survey include:

- Of 26 homes surveyed, 22 had one or more oil drums (the number of drums per property ranged from 3 to 70).
- The total number of drums identified was 231.
- Only 20 of 26 homes surveyed disposed of drums at the dump.
- Residents of 20 of 26 homes surveyed were willing to mark their drums for removal by the city.
- Residents of 25 of 26 homes surveyed stated they would participate in a community sponsored waste segregation or recycling program.
- Twelve residents thought there were problems with the existing dump due to blowing trash, no fence, wild animals, no trash segregation, and birds.

Three major common concerns identified by participants included:

- The need for correction of the existing problems at the dump;
- The need for general cleanup of the entire village; and
- The need for educating members of the community on environmental issues.

1.5.1 Ekwok Solid Waste Management Plan

An integrated Solid Waste Management Plan (SWMP) was completed in December 2005 for the Ekwok Village Council. A copy of the SWMP is included as Appendix D to this report. The SWMP included evaluations on the type and quantity of solid waste streams generated in Ekwok, and estimated future volumes of waste, based on predicted population increases for the next 20 years. The SWMP addressed solid waste management options for the community, including waste disposal, reuse, recycling, and minimization, along with recommendations for the development of a new, permitted landfill. The SWMP also included recommendations for implementing recycling and waste minimization measures, and evaluated three potential new landfill locations. Following community input, a final location, north of Blueberry Hill and 5,200 feet from the airport runway,

was selected as a new landfill site. The SWMP estimated that the cost of the landfill would be approximately $1.6M, with an estimated $29,000 in annual operation and maintenance costs, including operation of the landfill and implementation of the waste management program (Bristol, 2005).

1.5.2 Ekwok Wastewater System

The City of Ekwok, in collaboration with the DEC VSW Program, completed an evaluation of the wastewater treatment system (sanitary waste system including the sewage lagoon) in June 2006 to determine if and how the existing piped sewer system should be expanded to meet the current and future demands of the community (Appendix E). Several alternatives were evaluated. The most feasible option included expanding the existing wastewater collection system to serve existing on-site users, and ultimately expanding the service area to include 47 lots, in conjunction with sewage lagoon upgrades. The capital cost for this work was estimated to be approximately $2.2M, with annual operation and maintenance costs of approximately $21,000 (KAE Incorporated, 2006).

2.0 SITE INVENTORY

The EPA Brownfields representative, Ms. Joanne LaBaw, accompanied by a representative from URS, Ms. Laura Young, conducted a 2-day site visit with community representative Mr. Charles Nelson on September 20 and 21, 2006. The visit was in response to the Targeted Brownfields Site Assessment Questionnaire submitted by the City of Ekwok in February 2006. Ms. LaBaw and her team reviewed each site listed in the questionnaire, along with several other potentially contaminated areas that were identified as being of concern to the community. Areas investigated are shown on Figure 2 and associated photos are provided in Appendix B.

This section summarizes the findings of the site inventory.

2.1 CITY OF EKWOK FORMER BULK FUEL STORAGE AREA

The City of Ekwok formerly maintained a bulk fuel storage area adjacent to the Nushagak River prior to construction of a new bulk fuel storage area in 1994 by **Alaska Energy Authority (AEA)**. The former bulk fuel storage area includes two 20,000-gallon aboveground tanks, one previously held gasoline and one previously held fuel oil. A soil containment berm surrounds the two tanks. The containment appears to be unlined. The tanks were filled directly from a fuel barge. Two gasoline pumps are located within a small shed next to the fuel tanks. The pumps were reportedly used for fueling personal vehicles such as ATVs, boats, automobiles, and snowmobiles. An approximately 8-10 foot-high chain link fence surrounds the area. An empty 55-gallon drum in poor condition was observed within the fenced area. All of the former bulk fuel storage facilities remain intact; however, the tanks, associated piping, and pumps appear to be in poor condition and are probably not in working order. Stained gravel and a strong hydrocarbon odor were noted around the pumps, the wooden building, and near the tank valves, suggesting that some release to the ground surface has occurred.

The former bulk fuel storage area is located within the Nushagak River floodplain. The bulk fuel facility operator's building, located directly outside the fenced tank area and approximately 200 feet from the river, has a high water mark showing flooding of up to approximately 2 feet of water at some point. According to residents, the area is flooded approximately every 2 to 3 years. The former bulk fuel storage area is adjacent to the community boat landing, and community members have historically used the area for game and fish processing and smokehouses.

The community has expressed an interest in redeveloping or reclaiming this area for tourism related activities, boat servicing and storage, and subsistence use.

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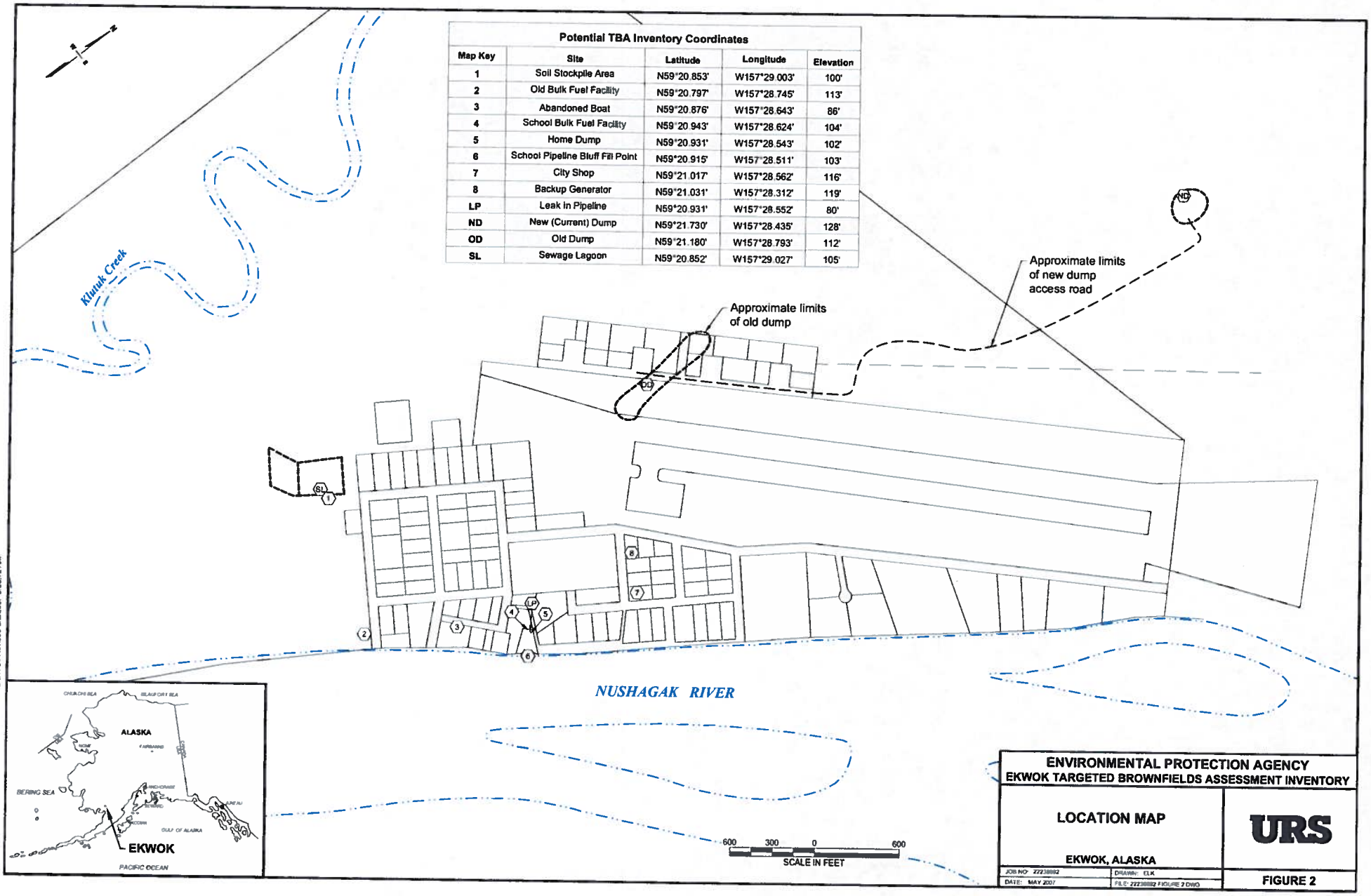

G:\PROJECTS\22238892 EKWOK\22238892 FIGURE 2.DWG, Revised 5/2/2007 9:53:12 AM

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2.1.1 Identified Concerns

Fuel contamination at the former bulk fuel storage area may pose a risk to human health or the environment, and remaining structures and facilities may pose a physical hazard. It is recommended that a site investigation with sampling be conducted to assess the presence, concentration, and extent of hydrocarbon impacts, and evaluate the potential need for corrective actions prior to any redevelopment. It is also possible that cleanup may be necessary. Site control or removal of the tanks, pumps, piping, and wooden structures may be necessary to mitigate physical hazards.

2.2 FORMER COMMUNITY DUMP SITE

The former community dump site was used in the 1960s and into the 1970s, until the current landfill was developed. The former community dump site is located on the northwest side of the airplane runway. The former dump site was closed and covered in the 1970s when Ekwok was incorporated as a second-class city, and a new landfill was constructed outside the village. The former dump site is currently overgrown with grass and trees. The new landfill access road crosses over the top of the former dump, bisecting it. No trash or debris is visible on the ground surface. Because the former dump site was the only common waste repository in the village while in use, it is likely to contain a variety of waste, including household refuse, construction debris, and old vehicle and equipment parts. It may also contain waste oil, solvents, or other materials potentially hazardous to human health or the environment.

In 1992, HUD constructed new homes adjacent to the former dump site. A cul-de-sac, with three homes and the community health clinic, is located within a few hundred feet of the former dump. VSW has been implementing a new drinking water well program for houses in this area. As part of that program, VSW tested shallow-aquifer wells closest to the former dump site for potential contamination. According to VSW, no contaminants typical of landfills were detected, and the water meets current state drinking water standards (DEC, VSW Program, 2006). Two studies completed by the Paug-Vik Development Corporation were reviewed as part of this TBA inventory and are included as appendices (F and G) to document analysis of drinking water.

2.2.1 Identified Concerns

Concerns associated with the former dump site include potential risks to human health or the environment from buried waste, contamination of groundwater resources, and potential physical hazards presented by debris that may be present at the dump site but was not observed during the inventory. Although no direct impact to groundwater quality has been shown with testing conducted to date, the close proximity of the former dump site to existing domestic wells and the potential for increased future use of the groundwater resource could lead to health risks.

2.3 CURRENT COMMUNITY DUMP SITE

The community dump site currently in use is located north-east of the new airport runway. It is unclear whether the property around the current dump site is owned by the City of Ekwok or the Ekwok Village Corporation. The current dump site is not a permitted landfill, and has been in use by the community since the 1970s.

The dump site consists of a linear trench, roughly 100 feet long and 30 feet wide, where the community dumps household waste, including refuse, construction debris, and vehicle and equipment parts. A fence surrounds part of the dump. Waste was observed at the current dump site from recent home renovations included copper pipe, pressure tanks, carpeting, and various fixtures. The community converted an old fuel storage tank into a waste incinerator, which is located adjacent to the trench. The incinerator is used on occasion, though not under any regular schedule. There does not appear to be any organized operation and maintenance of the dump site and incinerator; however, it appears that heavy equipment is used to push fill material over refuse somewhat regularly. During the December 2005 survey conducted by the Village of Ekwok Environmental Department and students from the William 'Sonny' Nelson School, almost half of the residents who participated reported problems with the current dump site (Appendix C). Recommendations for closing the dump site were included in the 2005 Integrated SWMP (Appendix D).

2.3.1 Identified Concerns

The dump is not permitted and is located quite close to the new airplane runway. Birds are commonly present at the site, and pose a significant hazard to air traffic. Refuse in the dump site also attracts other wildlife, such as foxes and bears, which could pose a danger to community members. Because the current dump site has been the only common refuse disposal area in use for approximately 30 years, there is a potential for a wide variety of waste materials to be present, possibly including substances that are potentially hazardous to human health or the environment.

2.4 PRIVATE HOME DUMPS

Some residents in the community dispose of old equipment, vehicles, boats and general debris on their private property. In some cases, this debris may present a general physical hazard, and in some cases there may be inappropriate disposal of potentially hazardous materials, including old batteries, hydraulic fluid, waste oil, and cooling system fluids.

2.4.1 Identified Concerns

Private disposal areas create potential physical hazards and may contribute to inappropriate storage or disposal of potentially hazardous materials, resulting in potential risk to human health and the environment.

2.5 ABANDONED ITEMS ON PUBLIC PROPERTY

Ekwok has many green areas within the city limits. These areas are on public (municipal and Village) land, adjoining privately owned lots, and are generally covered with trees and brush. Old

boats, vehicles, and equipment have been pushed onto these public lots and abandoned. Vegetation has grown up around the debris. There are two large boat engines abandoned by a resident (now deceased) next to the public boat landing area.

2.5.1 Identified Concerns

Primary concerns with abandoned vehicles, boats, and engines are the remaining batteries, hydraulic, and antifreeze fluids, residual oil and fuel, lead-based paint, and physical hazards. As with private home dumps, these items have the potential to leak potentially hazardous materials to the environment, and could lead to health risks.

2.6 SCHOOL FUEL STORAGE AREA AND PIPELINE

Ekwok has one public school, the William 'Sonny' Nelson School, and is part of the Southwest Region School District. The school owns and maintains a bulk fuel storage facility on the school grounds that includes one 20,000-gallon tank and three 30,000-gallon tanks containing diesel fuel. There is also one 300-gallon heating-oil day tank located next to the school. The larger tanks are surrounded by a fence, and a berm with a formed liner creating a **secondary containment** system. The 300-gallon tank is not enclosed in a bermed or lined area, but is surrounded by a fence.

The fuel tanks are filled from a pipeline that runs north-south from the school to the Nushagak River barge landing area. The pipeline extends out from the bluff, immediately upriver of the barge landing area where the fuel barge connects to the line and pumps fuel to the school tanks. There is at least one location on the line where community residents fill small jugs for personal use with fuel leaking from the line. A hole has been dug under the pipeline large enough to place a coffee can, to allow leakage to fill the container while the pipeline is full. This practice has been occurring for at least one generation of residents in Ekwok (estimated 30 to 40 years). The line does not appear to be drained once the tanks are filled from the barge, and fuel remaining in the line leaks to the ground surface. The known pipeline leak area is located adjacent to one of the community cemeteries. The integrity of the remaining segments of the line is unknown.

2.6.1 Identified Concerns

Evidence of leaking is visible along the pipeline and under tank valves, and spills from overfilling the 300-gallon heating oil tank have occurred. Continuous leaks, even when small, can result in significant soil and groundwater contamination over time, leading to adverse environmental impacts and may be of concern from a human health standpoint.

2.7 BACKUP GENERATOR

The City of Ekwok owns and operates a backup generator and associated 5,000 and 300-gallon fuel tanks. The generator and tanks do not have any secondary containment, nor is access restricted (existing chain-link fence is broken). A partially full, open-top, 55-gallon drum with heating oil was observed during the site visit.

2.7.1 Identified Concerns

The storage of fuel in tanks without adequate secondary containment, and in open containers contributes to an increased risk of direct exposure, or a release to the environment.

2.8 CITY SHOP

The City of Ekwok operates a vehicle and equipment maintenance shop. A used oil collection facility has been established outside the shop. City owned heavy equipment, including loaders and dozers, and electrical equipment (bucket-style transformers) in need of repair is stored outside the shop.

2.8.1 Identified Concerns

Shop operations do not appear to meet appropriate standards for the use and storage of potentially hazardous materials. Equipment maintenance appears to be conducted in the driveway of the shop, without appropriate spill containment. The used oil collection facility is located directly on the ground without appropriate secondary containment, and stained sorbents were observed discarded on the ground. Broken electrical transformers are also of concern due to the potential polychlorinated biphenyl (PCB) content. It is not known whether the observed transformer contains fluid, and if so, whether the fluid contains PCBs; however, if PCB-containing oil is present in the transformer, a significant release could occur.

2.9 SOIL STOCKPILES

Two soil stockpile areas were observed west of the village, just east of the sewage lagoon. It was reported that the soil was generated when residents performed cleanup operations on a small diesel spill. The actual fuel content of the soil is not known. The stockpile areas are constructed on a liner and enclosed by a wooden fence; however, alder trees, estimated to be approximately 10 years old, are growing over the stockpiled soil, with grasses and other shrubs. The wood fence surrounding the stockpile is in good condition.

2.9.1 Identified Concerns

The stockpiled soil could be a liability to the City of Ekwok if it contains fuel constituents in excess of applicable soil cleanup standards, and does not meet state criteria for stockpiled soil. Although no evidence of runoff was observed, rainwater or snowmelt in the future could carry contaminants from the stockpile containment and impact surrounding soil.

2.10 PROPOSED BULK FUEL STORAGE AREA

The City of Ekwok received a new bulk fuel storage facility built by AEA in 2004. The facility was constructed next to the old fuel storage area and the public boat landing, within several hundred feet of the Nushagak River. This location is within the floodplain, and according to local residents waters from the river breach the banks every two or three years. The community power-supply generator is co-located with the bulk fuel storage area. A new gravel pad has recently been constructed to house the bulk fuel facility north of the current location. Secondary containment

facilities were not observed on the new pad. Funding has been secured for moving the fuel storage facilities to a new location above the floodplain, however, it is not clear if the generator will also be moved.

2.10.1 Identified Concerns

The location of fuel storage and power generation facilities within the floodplain, and the lack of adequate secondary containment structures increases the risk of a fuel release.

2.11 SEWAGE LAGOON

The City of Ekwok operates a limited sewage treatment system, including a sewage lagoon. According to DEC records, between 10 and 16 homes are connected to a sewage main, with a lift station, eventually connecting to the sewage lagoon (Alaska Division of Commerce, 2006a; VSW, 2006). VSW conducted a preliminary inspection of the sewage lagoon in September 2006, and concluded that it is likely not functioning properly. Small trees observed in the settling area, and the general lack of water in the lagoon suggests that the liner may be breached. Most of the homes and businesses have septic tanks with leach fields; however, VSW indicated that all of these systems should be considered to be failing. The tanks require regular pumping, currently conducted approximately on a monthly basis. The City of Ekwok operates a small vacuum tank pulled by an ATV, which is used to pump residential septic tanks and discharge the effluent into the sewage lagoon.

2.11.1 Concerns

The integrity of the lagoon is suspect, leading to a potential for adverse groundwater impact.

3.0 RECOMMENDATIONS

3.1 CITY OF EKWOK FORMER BULK FUEL STORAGE AREA

This site has obvious signs of contamination, is currently not usable to the community, and the community has identified potential redevelopment uses that will benefit the local economy and subsistence users. The following actions are recommended:

- Determine land ownership for this site.
- Conduct a site investigation that will identify and characterize any existing impacts to soil, surface water, and groundwater, and determine the need for cleanup actions. The community should work with the EPA and DEC to develop an investigation and cleanup approach to ensure that, once completed, the area will be safe for future use.
- Measure the amount of fuel or oil remaining in the tanks and determine if the fuel is reusable.
- Determine the timeframe for which any necessary environmental cleanup actions need to be completed for redevelopment to be possible.
- Determine the best way to complete site cleanup, if warranted.
- Evaluate recycling or possible reuse of the tanks and other materials.
- Inspect the wooden buildings and, if they are safe, research possible reuse within the community.
- Evaluate the risk to human health and the environment for using the site as a food processing area.
- Complete a Site Development Plan and Business Plan for the planned reuse of the area.

3.2 FORMER COMMUNITY DUMP SITE

The former community dump site has not been fully characterized, and is a potential health risk and source of groundwater contamination. The following actions are recommended:

- Determine property ownership.
- Review VSW and Paug-Vik Development Corporation site investigations of the dump (Appendices F & G and VSW file data).
- Conduct a site investigation that will identify and characterize any existing impacts to soil, surface water, and groundwater, and determine the need for cleanup actions.
- Implement a monitoring program for local drinking water wells to evaluate potential impacts from the landfill and prevent any future exposure.
- Work with appropriate regulatory entities to determine the best approach for closing the dump.

3.3 CURRENT COMMUNITY DUMP SITE

The existing community dump may also present a health risk to people and the environment due to spills and leaks of contaminants from wastes left at the dump. Also, birds attracted by refuse at the dump cause a significant hazard to air traffic when using the aircraft landing strip. The 2005 Integrated SWMP identifies and outlines waste segregation programs that could be implemented at Ekwok. Construction of a new permitted landfill (as identified in the waste management plan), will make the existing dump no longer needed by the community. The following actions are recommended:

- Determine property ownership.
- Investigate potential funding sources to implement the recommendations in the Integrated Solid Waste Management Plan, and construct the new permitted landfill (Table 1).
- Once the new landfill is constructed, close the existing dump immediately and fence to prevent future dumping. Closure recommendations are included in the 2005 Integrated SWMP.
- Complete a site investigation to determine the extent of the dump, and potential for soil and groundwater contamination.
- Evaluate future property uses such as subdivision or community park (greenspace), library, or community center. Future use will be important in determining the level of effort for cleanup.

3.4 PRIVATE HOME DUMPS

The practice of private home dumping is probably in part attributable to the lack of an organized waste management program and adequate landfill. The following actions are recommended:

- A community information program should be implemented to educate residents with regard to proper handling, storage, and disposal of waste materials, and the importance of preventing environmental and human health problems associated with solid and hazardous wastes.
- Actions outlined in the 1995 SWMP should be implemented.

3.5 ABANDONED ITEMS ON PUBLIC PROPERTY

Vehicles, boats, engines, and other miscellaneous equipment abandoned on public property creates potential hazards, and could be a source of physical hazard or environmental contamination. The following actions are recommended:

- A full assessment of public land within the community is recommended to identify the location of significant abandoned items, evaluate potential localized impacts, and where appropriate, assess the nature and extent of impacts.

- A plan should be developed to manage, remove, consolidate, or dispose of abandoned items. Many areas in the community could be returned to greenspace after solid waste removal.

3.6 SCHOOL FUEL STORAGE AREA AND PIPELINE

Surface staining and strong odors indicate potentially significant levels of spilled fuel from the fuel pipeline, fuel storage tanks, and the heating oil tank. Leaking tanks and pipes may have affected the soil and shallow groundwater in the area. The following actions are recommended:

- Coordinate with DEC and the School District to assess potential problems from leaking pipelines and tanks owned and administered by the School District.
- Work with DEC and the School District to complete a site investigation of the fuel storage area and the entire pipeline alignment to determine the presence and extent of fuel contamination.
- Identify property ownership along the pipeline corridor.
- Evaluate and upgrade as necessary current secondary containment systems.

3.7 BACKUP GENERATOR

Inadequate fuel storage systems and inappropriate fuel handling practices at this site increase the risk of a release. The following actions are recommended:

- The heating oil observed in the 55-gallon open-top drum should be immediately removed and contained in a closed system that does not have the potential to spill or overfill during a rain event.
- Develop and implement a fuel storage and handling plan that meets appropriate standards.
- Conduct an assessment of the site to evaluate the presence, nature, and extent of existing environmental contamination.

3.8 CITY SHOP

Inadequate fuel and waste storage systems and inappropriate fuel and waste handling practices at this site increase the risk of a release. The following actions are recommended:

- Develop and implement a fuel and waste storage and handling plan that meets appropriate standards.
- Conduct an assessment of the site to evaluate the presence, nature, and extent of existing environmental contamination.

3.9 SOIL STOCKPILES

Two stockpiles of soil reportedly impacted with diesel fuel are currently a liability for the community. The following actions are recommended:

- Each stockpile should be characterized in accordance with DEC guidelines to determine appropriate disposition.
- If contaminant concentrations in the stockpiles exceed regulatory cleanup criteria, a Corrective Action Plan should be prepared to address proper stockpiling and appropriate treatment or disposal.

3.10 PROPOSED BULK FUEL STORAGE AREA

The new bulk fuel storage site has been selected; however facilities have not been relocated. The following actions are recommended:

- New fuel storage tank locations should provide adequate secondary containment.
- It is recommended that all facilities, including the community power supply generator, be relocated to the new area above the flood zone as soon as possible to avoid damage from future floods.

3.11 SEWAGE LAGOON

The existing sewage lagoon is apparently leaking, and may be a source of groundwater contamination and a human health or ecological risk. The following actions are recommended:

- An appropriate engineering evaluation of the lagoon should be conducted to determine the nature of the failure, and to evaluate options for correcting the problem.
- The sewage lagoon should be either repaired, or properly decommissioned and replaced to meet the current and future needs of the community.

3.12 GENERAL COMMUNITY-WIDE RECOMMENDATIONS

Ekwok can take steps to aid in obtaining funding for community projects, including determining property boundaries and ownership, and further developing reuse goals for specific community owned areas. This information will be required for application of any grant under the Brownfields program.

Results from the house-to-house survey conducted in Ekwok in December 2005 indicated that many community members in Ekwok are concerned for the environment and would participate in a community sponsored waste management program. Solid waste management practices can be improved by implementing the 2005 Integrated SWMP (Appendix D). Appendix A of this report includes a listing of potential funding sources to assist with solid waste programs.

The community can meet with representatives to develop a plan to address potential contaminated sites. This should include sites that may be potentially eligible for Brownfields funding or funding from other sources.

4.0 POTENTIAL FUNDING SOURCES

Table 1 identifies potential grant sources by issue topic. Several sites may be eligible for funding through multiple sources. For example, the recommendation for the private home dumps was to develop a solid waste management system. For this site, review potential grants in the solid waste section of Table 1, as well as the hazardous waste section.

There are several directories of grant resources, including the Alaska Directory of Rural Resources, available from the United States Department of Agriculture (USDA), 800 West Evergreen, Suite 201, Palmer, Alaska, 99645; telephone 907-761-7705. The Alaska Department of Commerce, Community and Economic Development (ADCCED) (http://www.commerce.state.ak.us/dca/grt/allgrants.htm) administers many grants relevant to rural communities. The Solid Waste Alaska Network also provides an inventory of available grants and application instruction (http://www.ccthita-swan.org/main/index.cfm). The Catalog of Federal Domestic Assistance (http://12.46.245.173/cfda/cfda.html) is a searchable website with information regarding a broad array of grants.