

ANALYSIS OF BROWNFIELD CLEANUP ALTERNATIVES
Yukon Trading Post
Circle, Alaska
March 21, 2018

1.0 Introduction

This analysis of Brownfield Cleanup Alternatives (ABCA) is intended as a screening tool to ensure and document that the appropriate type of cleanup is selected to address environmental contamination at the Yukon Trading Post property in Circle, Alaska. The preferred remedial action considers site characteristics, the surrounding environment, potential future uses, and cleanup goals.

2.0 Site Description

The Yukon Trading Post property is located in the town of Circle in interior Alaska. The property is a parcel owned by the Danzhit Hanlaih Corporation located at 18 Front Street (Mile 162 Steese Highway). The legal description is Lots 1 and 2, Block 8, Circle Townsite, U.S. Survey No. 3725; Records of the Fairbanks Recording District, Fourth Judicial District, State of Alaska and a parcel of land located within and being a portion of U.S. Survey No. 1301, at Circle City, Alaska, and which is more particularly described as follows: beginning at Corner No. 18 as shown on the plat of said Survey No. 1301, proceed thence due South 100.00 feet; thence due West 269.65 feet the Easterly boundary of the airport reserve; thence North 05055' West along said boundary 100.54 feet; thence due East 280.01 feet, to the point of beginning; Records of the Fairbanks Recording District, Fourth Judicial District, State of Alaska; Section 31, Township 12 North, and Range 18 East.

The Yukon Trading Post operated as a gas station from approximately the 1970s to the 1990s. Three underground storage tanks (USTs) were removed in 1995 (one 5,000 gallon gasoline tank; and two 2,000 gallon gasoline tanks), however petroleum-contaminated soil is still present. Danzhit Hanlaih Corporation received the deed to the property in 2010 after several private ownerships. The building located on the property adjacent to the contamination is currently used as a hall for cultural gatherings, however the remaining contamination limits full use of the property. The community is interested in using the existing infrastructure and land as a central gathering place and also protecting the nearby community well. In its DEC Brownfield Assessment and Cleanup (DBAC) application, Danzhit Hanlaih, proposed three possible reuse scenarios depending on results of the cleanup and associated acceptable exposure levels: a Kid's Don't Float bulletin board due to its proximity to the boat launch (high traffic); a staging area for aluminum can recycling due to its central location (high traffic); a cultural monument due to its proximity to the hall (low traffic).

3.0 Previous Investigations

January 1995. Oil Spill Technology Inc. “*Underground Storage Tank (UST) Site Assessment and Recommendations for Yukon Trading Post Circle, Alaska*”. According to this 1995 report, the USTs were estimated to have been installed in 1974, and their removal included the dispensing island, and associated fuel piping. An estimated 200 cubic yards of soil were removed from the former UST location; however, this site assessment stopped the excavation of contaminated soils due to a lack of storage space for the removed soils before all of the contaminated soil was removed. It was recommended that the air vent piping system installed in the excavation be monitored regularly and estimated that approximately 100 cubic yards of contaminated soil remained. The three soil samples submitted for analysis from the base of the UST excavation found Gasoline Range Organics up to 1,560 milligrams per kilogram (mg/kg), benzene up to 7.77 mg/kg, toluene up to 55.1 mg/kg, ethylbenzene up to 26.18 mg/kg, total xylenes up to 120.74 mg/kg, chlorobenzene up to 7.26 mg/kg, and 1,2-dichlorobenzene up to 27.19 mg/kg; all of which exceed the default ADEC Method 2 cleanup criteria.

July 1999. Rockwell Engineering & Construction Services, Inc. “*Yukon Trading Post Release Investigation Finding*”. According to this report, several soil borings were advanced in the vicinity of the former USTs and dispensing island, and indicated that the majority of the contamination remained near the dispensing island. However no analytical samples were submitted. It was estimated in this report based on Photoionization Detection (PID) screening, and olfactory indicators that approximately 700 cubic yards of contaminated soils remained, and the report recommended landfarming to remediate the soils.

June 2016. Travis/Peterson Environmental Consulting Inc. “*Circle Yukon Trading Post Work Plan*” and associated cost estimate letter. According to the work plan, the chosen method was to excavate contaminated soils with confirmation sampling of excavation boundaries once it was believed the limits of contamination had been reached. The estimated costs for excavating, confirmation sampling and landfarming approximately 700 cubic yards of soil was \$86,471, and did not account for encountering any groundwater.

4.0 Remedial Alternatives Considered

This section identifies the remediation alternatives that may be used to address the environmental contamination at the site. The “No Action Alternative” is used as the baseline against which the other alternatives are analyzed. All of the alternatives will be evaluated with respect to Chapter 75 of Title 18 of the Alaska Administrative Code (18 AAC 75).

The following broad categories of evaluation criteria were considered in assembling remediation at the site:

- Overall protectiveness to public health and welfare of the environment
- Feasibility in achieving site redevelopment

Summaries of general cost estimates for each alternative (with the exception of no action) are presented below. Each alternative includes the same basic assumptions for level of effort in preparing a work plan, characterizing the contaminated soil, and reporting. However, the alternatives include different approaches to contaminated soil treatment, as described below.

4.1 No Action – Alternative #1

The “No Action Alternative” is included for comparison purposes as stipulated in the ABCA process. This alternative does not address the contamination issues at the site. Contamination is present in the surface and sub-surface soil adjacent to the building and could potentially migrate to surface water having a possible negative effect on human health with prolonged exposure. Given the use of this property for community functions, this property would remain an environmental hazard. The no action alternative has no associated cost.

4.2 Removal and Thermal Desorption - Alternative #2

The “Removal and Thermal Desorption Alternative #2” includes excavation of the bulk of contaminated soil, transport to Fairbanks via road, and treatment via thermal desorption. Thermal desorption involves heating the soil in a specialized “incinerator” to remove contaminants from bulk soil. The advantage of this alternative is that it eliminates the risk to human health and the environment almost immediately. The disadvantage is the high cost. The following table presents a summary of general estimated costs for Alternative #2:

Item	Task 1 - Work Plan/ Reporting	Task 2 – Excavation and Thermal Desorption	Task 3 – Delineation and Characterization of remaining soil - excavator	Task 4 – Delineation and Characterization of remaining soil - boreholes
Labor	\$6,300	\$16,500	\$4,500	\$7,550
Subcontract	\$0	\$99,000	\$13,700	\$12,100
Equipment and supplies	\$0	\$850	\$220	\$180
Materials	\$0	\$4,000	\$6,745	\$8,000
Task Totals	\$6,300	\$120,350	\$25,165	\$27,830
Contingency (15%)	\$945	\$18,000	\$3,775	\$4,170
Totals w/contingency	\$7245	\$138,350	\$28,940	\$32,000
PROJECT TOTAL - SOIL TREATMENT BY THERMAL DESORPTION: \$206,535				

This cost estimate assumes soil would be loaded into dump trucks, trucked to Fairbanks, and disposed via thermal desorption.

4.3 Removal and Landfarming - Alternative #3

The “Removal and Landfarming - Alternative #3” includes excavation of the bulk of contaminated soil and treatment via landfarming at a suitable local site, with additional site characterization through test pits and soil borings as needed. Landfarming is a means of treating contaminated soil

through a combination of physical and biological processes by spreading it in a thin layer, tilling it regularly, and augmenting it with fertilizer as needed. The advantages of this alternative are that it can achieve cleanup levels fairly rapidly (1 to 2 years) if the landfarm is well managed and tilled frequently, it is a proven solution readily achievable with local equipment, and the costs are relatively low; while the additional site characterization allows for data collection for a possible site closure. The disadvantages are that the landfarm requires active management and depends on the routine use of heavy equipment. Also, exposure to contamination remains a relatively high risk throughout the treatment process, particularly for the landfarm operator. The following table presents a summary of general estimated costs for Alternative #3:

Item	Task 1 - Work Plan/ Reporting	Task 2 – Excavation and Land Farming	Task 3 – Delineation and Characterization of remaining soil - excavator	Task 4 – Delineation and Characterization of remaining soil - boreholes
Labor	\$6,300	\$16,500	\$4,500	\$7,550
Subcontract	\$0	\$26,300	\$13,700	\$12,100
Equipment and supplies	\$0	\$850	\$220	\$180
Materials	\$0	\$4,000	\$6,745	\$8,000
Task Totals	\$6,300	\$47,650	\$25,165	\$27,830
Contingency (15%)	\$945	\$7,150	\$3,775	\$4,170
Totals w/contingency	\$7245	\$54,800	\$28,940	\$32,000
PROJECT TOTAL - SOIL TREATMENT BY LANDFARMING: \$122,985				

This cost estimate assumes relocation of the soil to the planned treatment site, no bottom liner, in a bermed land farm area, to a depth not to exceed 12 inches. The landfarm is to be constructed in accordance with ADEC guidelines and regulation. Future sampling or maintenance of the landfarm is not included as these tasks and will be completed by the local corporation and/or tribe.

5.0 Preferred Remedial Alternative

The remedial alternatives were evaluated based on overall protectiveness to public health and welfare of the environment, and feasibility in achieving site reuse.

The “No Action – Alternative #1” would leave the contaminated soil in place possibly endangering the community by exposure to contamination via multiple complete pathways, and hampering re-use of the site.

Both Removal and Disposal Alternatives #2 and #3 are considered technically feasible and capable of protecting human health and the environment. However, Alternative #2 is not economically feasible due to the cost prohibitive nature of transporting and treating a large volume of soil with thermal desorption. DEC has determined that the “Removal and Landfarming - Alternative #3” is the preferred strategy for the site. The removal of contaminated soil will provide an important step in reuse of this property by providing a safe location for a community gathering space, while characterization may allow for site closure in the Contaminated Site database.

7.0 References

Oil Spill Technology Inc. January 1995. “*Underground Storage Tank (UST) Site Assessment and Recommendations for Yukon Trading Post Circle, Alaska*”. ADEC File No. 160.26.004

Rockwell Engineering & Construction Services, Inc. July 1999. “*Yukon Trading Post Release Investigation Finding*”. ADEC File No. 160.26.004

Travis/Peterson Environmental Consulting Inc. June 2016. “*Circle Yukon Trading Post Work Plan*” and associated cost estimate letter.