Analysis of Brownfield Cleanup Alternatives
Jumping Salmon Lodge
Chenega Village, Alaska
May 2025

1.0 Introduction

This Analysis of Brownfield Cleanup Alternatives (ABCA) is intended to ensure and document that the appropriate cleanup is selected to address environmental contamination at the Jumping Salmon Lodge property. The preferred remedial action considers site characteristics, the surrounding environment, potential future uses, and cleanup goals.

2.0 Site Description

The Jumping Salmon Lodge is located on Evans Island in Prince William Sound. The property is on the southeast shore of Sawmill Bay, approximately 1 mile south of Chenega, AK. Local geology consists of shallow gravel-rich silt-loam soil, underlain by strongly folded, interbedded Paleocene sandstone/siltstone and pillow basalt (U.S. Geological Survey, 1979).

The Jumping Salmon Lodge property is 0.49 acres with a main lodge, five cabins, a bathhouse, a workshop, outhouse, chicken coop, storage shed, and generator shed. Since the late 1990s, the property has operated as a sport fishing lodge. The property was acquired by the Chenega Corporation with plans to remediate and renovate the site for future use as a cultural camp and education center.

3.0 Previous Investigations

A Phase I Environmental Site Assessment, conducted by Travis/Peterson Environmental Consulting, Inc. (TPECI) indicated potential environmental impacts that required further investigation (TPECI, 2017). Field observations and analytical results of soil samples identified petroleum exceedances near the fuel storage area. Other potential sources of contamination noted in the report include equipment storage, potential lead-based pain or asbestos-containing material, and historical petroleum contamination from the 1989 Exxon Valdez oil spill.

Weston conducted site characterization activities in September 2020, which included a hazardous building materials survey; a drum, tank, and container inventory and hazard classification; and soil sample collection. Soil samples were analyzed for diesel-range organics (DRO), residual-range organics (RRO), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and lead. Analysis identified that DRO, RRO and lead were present in the soil at concentrations exceeding ADEC Method Two Table B1/B2 migration to groundwater (MTG) cleanup levels for soil but were below human health cleanup levels.

Additional site characterization was conducted in September 2022 by Weston Solutions. Characterization activities included an investigation of soil, surface water, and groundwater at the site to evaluate concentrations and extent of lead and petroleum hydrocarbons. Analytical results showed DRO concentrations over MTG cleanup levels in six samples, though when processed

with silica gel cleanup (SGCU) methods, all but one sample were reported at concentrations below MTG cleanup levels and all were below human health cleanup levels. One sample collected from the intertidal zone was reported at a concentration of 574 milligrams per kilogram (mg/kg). Analytical results indicate most DRO exceedances are attributable to biogenic interference.

Lead was reported in exceedance of DEC cleanup levels in both soil samples collected in 2020 (329 and 807 mg/kg), within 10 ft of Cabin 2, on the east and north sides of the cabin. Lead contamination appears to be limited to a confined area on the northern and eastern sides of Cabin 2. Analytical results from sampling conducted in 2022 around Cabin 2 found no additional exceedances of lead concentrations.

In 2023, Weston Solutions returned to the site to conduct additional investigation of groundwater at the site and to determine concentrations and extent of lead and petroleum compounds in groundwater at the property. Groundwater samples were collected from two temporary sampling points. Analytical results of groundwater samples from one of the temporary well points reported concentrations of lead above DEC's Table C Groundwater Cleanup Levels (19.8 µg/L as compared to 15 µg/L). This sample was collected downgradient of the fuel storage area at the site. However, water was not present in either temporary point boring at the time of installation. After a rainfall event occurred at the site, field personnel collected groundwater samples. These samples were noted to be extremely turbid and were considered to be porewater and not true groundwater.

Field personnel also advanced five additional borings to bedrock depth at locations across the site where soil or measurable broken shale was present over bedrock to determine whether groundwater was present in other locations. Groundwater was not present in any of the hand borings at the time of advancement. Bedrock depth across the site ranged from 0 inches to 4 ft below ground surface (bgs). Bedrock outcrops were also observed throughout the site.

The absence of water in any of the seven borings which were advanced to bedrock depth at points across the property indicates groundwater at the site is not persistent and a contaminant exposure pathway is likely incomplete. Based on depth to bedrock at the site and the lack of drinking water wells onsite, DEC has determined the migration to groundwater pathway to be incomplete at this site. Additionally, collection of qualitative and quantitative groundwater samples has been unsuccessful at the site, indicating groundwater is porewater over bedrock. Consequently, the remedial alternatives considered in this ABCA focus on addressing soil contamination.

4.0 Remedial Alternatives Considered

Summaries of general cost estimates for each soil contamination remedy 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.

Table 1: Cost Summary of Remedial Alternatives

Remedial Alternatives at Jumping Salmon Lodge		Cost	Potential Range	
			(-25%)	(+50%)
Alternative #1	No Action (Soil Cap)	$0.00	$0.00	$0.00
Alternative #2	Critical Removal	$25,000	$18,750	$37,500
Alternative #3	Partial Removal	$160,000	$120,000	$240,000
Alternative #4	Full Removal	$325,000	$243,750	$487,500

Alternative #1—No Action (Soil Cap)
~$0.00

The "No Action" alternative is included for comparison purposes as stipulated in the ABCA process. Under the "No Action" alternative, a soil cap will be placed on top of lead-contaminated soils to control exposure. This alternative would not remediate the source areas and could require ongoing management by Chenega Village Corporation to prevent digging in the areas of contaminated soil. For comparison, the "No Action" alternative has no associated cost.

Alternative #2—Critical Removal
~$25,000

Removal and disposal of construction materials containing lead-based paint, and lead-contaminated soil. This alternative assumes five (5) cubic yards of lead-contaminated soil will be removed, considered hazardous waste and subject to RCRA requirements, and will be transported to a subtitle C landfill in Arlington, Oregon. Any nonhazardous materials and soil will be transported to a subtitle D landfill.

Debris and contaminated materials will be containerized in overpacks or supersacks as appropriate and transported to Whittier via landing craft. Cargo will be transported from Whittier to Anchorage via truck. This option includes costs include mobilization from Whittier via landing craft, labor, per diem, equipment and materials, waste consolidation, containerization, labeling, manifesting, and transport and disposal or treatment of waste at appropriate facilities.

Alternative #3—Partial Removal and In-Situ Treatment
~$160,000

Removal and disposal of construction materials containing lead-based paint, lead-contaminated soil, and treatment of petroleum-contaminated soils using RegenOx. In addition, this option would include emplacement of fuel tanks and drums into secondary containment.

Alternative #4—Full Removal
~$325,000

Removal and disposal of construction materials containing lead-based paint and lead-contaminated soil. In addition, this option would remove and thermally treat approximately 120 cubic yards of petroleum-contaminated soil.

This alternative includes removal and disposal of all drums and containers on the property. This includes approximately:

- Two 100-gallon tanks
- Three 500-gallon tanks
- Two 275-gallon IBC totes
- Five 55-gallon drums
- Seven >5–30-gallon drums
- Twelve 5-gallon containers
- Ten 1–5-gallon containers
- One hundred twenty 1-gallon containers
- Two hundred <1-gallon containers
- Ten 100-pound and four 20-pound propane tanks

5.0 Preferred Remedial Alternative

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

The "No Action (Soil Cap)– Alternative #1" would leave the contaminated soil in place possibly endangering the community by exposure to contamination and hampering re-use of the site.

Alternatives #2, #3 and #4 are considered technically feasible and capable of protecting human health and the environment. Alternative #2—Critical Removal would be protective of the community as it would remove the lead-contaminated soil from the subject property. Alternative #3—Partial Removal of all lead-contaminated soils, construction materials and in-situ treatment of petroleum-contaminated soils would similarly be protective to the community in that it would remove the lead-contaminated soil from the subject property and then transport and dispose of it in a regulated landfill elsewhere, as well as treat petroleum-contaminated soils onsite. Alternative #4—Full Removal of all lead- and petroleum-contaminated soils, construction materials and containers would be protective to the community as it would remove all risks to human health and the environment and allow full reuse of the property. However, Alternative #4 is the least cost-efficient alternative and would require extensive logistics to complete the full removal of all contaminated soils, construction materials and containers at the site.

Thus, DEC has determined that Alternative #2—Critical Removal is the preferred strategy for the site due its economic feasibility and certainty to achieve cleanup objectives. The removal of lead-contaminated soil and materials will provide an important step in reuse of this property by providing a safe location for a gathering space and area for summer cultural camps.

6.0 Figures

Figure 1: Site Map

Figure 2: 2020 XRF Field Screening and Lead Analytical Results

Figure 3: 2020 Petroleum Soil Samples and Analytical Results

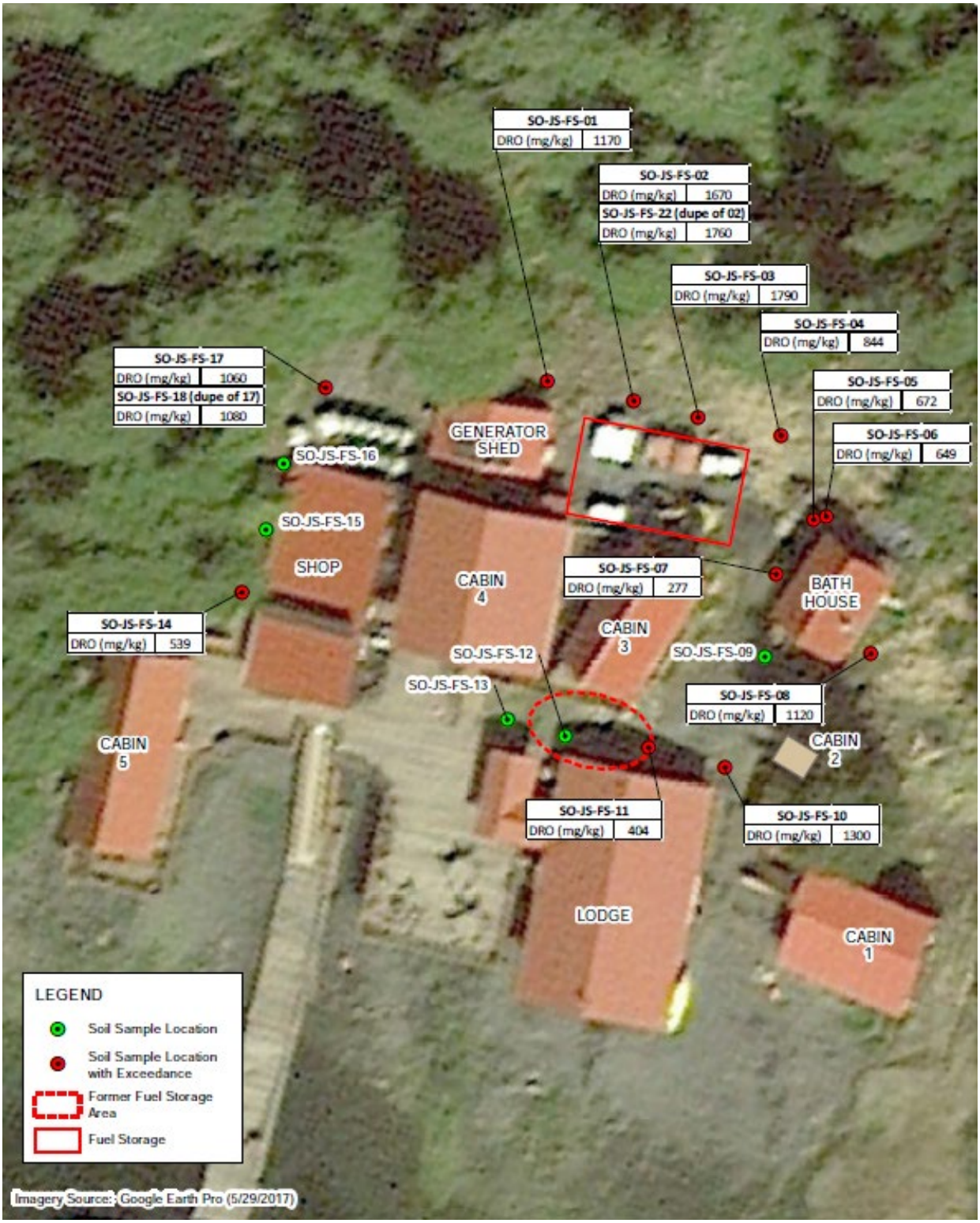

Figure 4: 2022 Soil and Groundwater Exceedance Locations

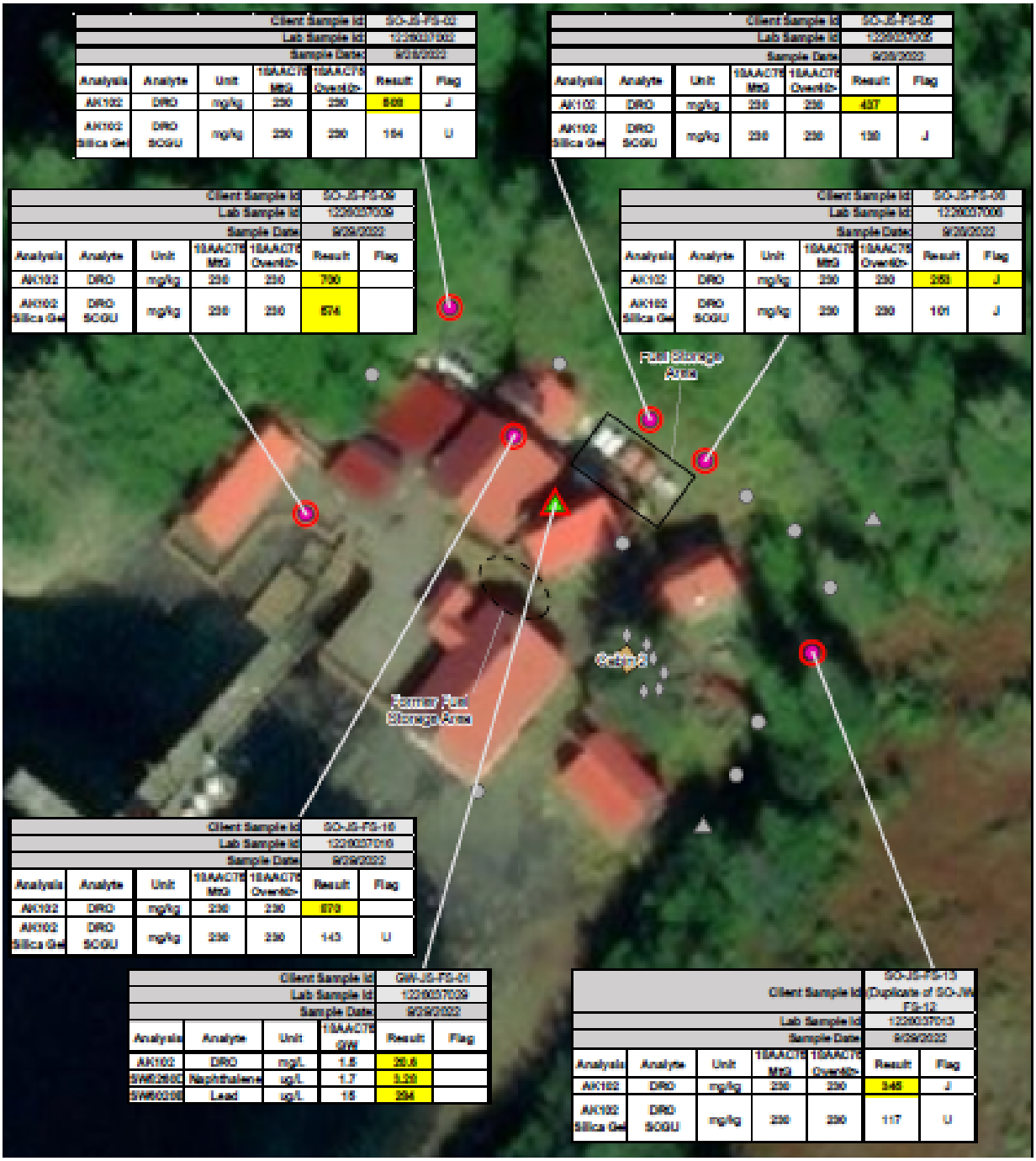

Figure 5: Temporary Well Point Locations and Groundwater Exceedances

7.0 References

TPECI (Travis/Peterson Environmental Consulting, Inc.) 2017. *Phase I Environmental Site Assessment.*

USGS (U.S. Geological Survey) 1979. *Geologic Map of the Seward and Blying Sound Quadrangles, Alaska.*

Weston (Weston Solutions, Inc.) 2020. *Site Characterization Report, Jumping Salmon Lodge, Chenega Village, Alaska*. December.

Weston. 2023. *Site Characterization Report, Jumping Salmon Lodge, Chenega, Alaska*. March.

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