Uncertainties for which sampling is required (i.e., to be incorporated into Work Plan).

No.	Uncertainty	Recommended Resolution/ Responsibility	Type of info required	Quality	Quantity	Priority
1	SS005 – No evidence of MOGas in soil. Tank as potential source area has never been confirmed to be present. Is there contaminated surface/groundwater immediately downgradient of suspected former tank location?	Acquire samples from three closest surface water bodies. Determine downgradient direction of flow.	TAH/TAQH Confirmation of no sheen.			L
2	TU012 – Only one deep sample (6 ft) collected from removed UST. Is there groundwater contamination and/or residual soil contamination? To be addressed as part of SS011.	Collect deeper soil samples and groundwater from beneath site?	DRO/RRO, PAHs	Method 2 Migration to GW		L
3	SS011 – What is the extent of the remnant source (petroleum-only) that could contaminate groundwater? Adjacent to TU012.	Confirm potential source. Collect soil samples at "both ends" of former UST to xxx in depth.	DRO/RRO, PAHs	Method 2 Migration to GW		M
4	SS004 Wood Building Area. Previous discrete sample location showed DRO-only above ADEC criteria. Composite samples did not show contamination above criteria. Need to delineate	Sample soil and (groundwater?) using ADEC protocol for closure. Groundwater locations to be selected based on distribution of contamination within entire SS004 area.	DRO/RRO			H

No.	Uncertainty	Recommended Resolution/ Responsibility	Type of info required	Quality	Quantity	Priority
	extent of DRO-only contamination.					
5	SS004: Suspected AST. What is the vertical and lateral extent of DRO contamination in soil?	Sample soil using ADEC protocol for tank closure. Groundwater locations to be selected based on distribution of contamination within entire SS004 area.	DRO/RRO			H
6	SS004: Drum Storage area. Delineate extent of contamination this area using protocol conclusive to state for closure.	Sample surface and subsurface soil. Groundwater locations to be selected based on distribution of contamination within entire SS004 area.	PCB,DRO, Cr			H
7	SS004 Trench Can Hg and As values be appropriately managed in terms of background concentrations during risk communication?	Due diligence on potential sources of Hg is necessary.	Research and examination of specific background data.			L
8	SS004 - Construction camp in vicinity. Did activities impact this area – primarily via fuel issues?	Potential coverage of this area considered while positioning soil/GW sampling for other SS004 locations to take into account the footprint of the construction camp.	DRO/RRO			L
9	SS007 – Fuel storage area. Fuel and related substances. Historical data indicates DRO/RRO, PAHs in soil. Extent of contamination in soil	Soil data needed to delineate extent to Method 2 migration to GW values. Review historical data to determine if BTEX likely present to support that sampling not needed for BTEX. If data does not support conclusion,	Soil data for PAHs, DRO/RRO	Be aware of possible dilution required for diesel analysis that may		H

No.	Uncertainty	Recommended Resolution/ Responsibility	Type of info required	Quality	Quantity	Priority
	is not defined.	collect additional data in soil near source to determine if BTEX present above human health risk values.		cause dilution of BTEX.		
10	SS007 – If source area exists based on soil sampling, determine whether surface water in creek has been impacted.	If extent of source indicates potential exposure to marine organisms, collect sediment data to determine risk If elevation data indicates that stream elevation lower than mean high tide, need to collect sediment data from creek to determine risk	Elevation data for site to determine likely groundwater flow pathway Sediment data for PAHs (BTEX based on #9)			M
11	SS010 - Underground fuel tank associated with water supply. Determine whether UST still exists.	Use geophysical techniques to determine presence or absence of tank. If tank exists, comply with State tank closure criteria.				H
12	SS010 –Determine extent of contamination in soil – Fuel only.	If tank is not present, and site soil is above cleanup criteria, and soil is accessible (i.e., not covered by landslide), then remove soil. Be sure to acquire sufficient data to perform risk assessment (i.e., BTEX, PAH, to establish need to remediate (see 27Oct04, SAFIEE, Draft AFI32-7020 ERP 2.2.2.6).	Soil data for DRO/GRO, PAHs BTEX? Slope stability info	Sufficient data to perform risk assessment		M

No.	Uncertainty	Recommended Resolution/ Responsibility	Type of info required	Quality	Quantity	Priority
		If slope stability causes removal action to be unsafe, consider taking no action.				
13	LF006 Old Disposal Area Does contamination exist within the disposal area? Potential sources of contaminants batteries, vehicle parts, engines, fire extinguisher, drums. Does contamination migrate from the landfill into the adjacent surface water/GW?	Potential COCs include lead, petroleum, VOCs, SVOCs, and PCBs. Because past testing has shown no detections of pesticides or herbicides and because there is no indication that there was any need for use of pesticides or herbicides, they will not be included in the PCOC list. Determine stream flow and groundwater flow direction. Sample Downgradient media, which may include: GW, SW, and sediment If COCs are detected in GW above criteria, consider installation of wells.	Elevation/flow data SW/GW data for Pb, DRO/RRO, VOCs, SVOCs, and PCBs			H
14	OT001 Composite Building Determine whether groundwater exists at this location	Groundwater sufficient for use as drinking water is not present. Migration to groundwater pathway criteria do not apply. Need to determine if groundwater to surface water pathway exists and	Seep data for PCBs, SVOCs, VOCs Seeps will have to be inspected for sheens and			H

No.	Uncertainty	Recommended Resolution/ Responsibility	Type of info required	Quality	Quantity	Priority
		whether the surface water is impacted by sampling at seeps immediately downgradient. If not above surface water criterion at seeps, the soil cleanup criteria in the source area does not need to consider the migration to groundwater criteria. DRO is not included in above logic because there is only a "sheen" criterion for surface water.	determination will need to be made whether sheen is DRO related if present.			
15	OT001 – Extent of soil contamination in source areas around composite building (tanks, outside of doors, around antennas)	BTEX, DRO, PAHs near diesel tanks PCBs, VOCs 8260 near doors of composite building. DRO, PCBs around Antennas	Review chromatograms for composite samples collected during the PA/SI to see if DRO really detected or if background. Collect soil data to delineate area above whatever screening level is established in #14.			H
16	WP003 Drainage outfall Area of impacted soils at outfall	More VOC data needed because potential downgradient extent not sufficiently defined for inhalation	VOCS soil data from outfall area			H

No.	Uncertainty	Recommended Resolution/ Responsibility	Type of info required	Quality	Quantity	Priority
	not known. DRO and RRO is above cleanup criteria.	and ingestion pathway. VOCS samples needed down hill of outfall at the bedrock surface. Need samples on 1) distal edge of visually stained soil 2) center of stained soil 3) at pipe discharge and 4) step outs on either side of the stained soil at the center and distal edge. If results below Method 2, VOCs inhalation/ingestion pathway determined not to be complete. If results above Method 2, determine how to bound concentrations based on likely remedy. Collect SW sample at seeps to determine if VOCs have impacted migration to surface water pathway. If results are not detected, migration to GW pathway deemed incomplete and soil compared to INH/ING values only. DRO/RRO in soil sampled to delineate concentrations above both the Method 2 migration to GW criteria and INH/ING values. Data for PAHs should be collected from highest DRO/RRO hit if DRO/RRO	Seep data for PAHs, SVOCs, VOCs Seeps to be inspected for sheens and determination will need to be made whether sheen is DRO related if present. Soil data for DRO/RRO, VOCs potentially PAHs			

No.	Uncertainty	Recommended Resolution/ Responsibility	Type of info required	Quality	Quantity	Priority
		values are greater than previously detected. If PAHs detected above Method 2 values, evaluate the need to collect additional PAH data. Closure quality soil data required every 75 lineal feet to determine if release has occurred from pipe leaks.				
17	Battery Site	Determine vertical and lateral extent of Pb contamination .	Soil data – Pb only			H
18	FL009	Locate outfall Collect one soil sample from both sediment in tank and at outfall (surface and above bedrock). If concentrations below Method 2, and no visual indication of release at outfall is pipeline, no further sampling needed. If find VOC contamination at either location, use same protocol delineated at WP003. If find other COCs at the tank only, collect one subsurface soil sample at fill/bedrock interface both up and downgradient side of tank. Sample submitted for reduced list based on what detectedto determine if release	Soil/sediment data for DRO, RRO, GRO, PCBs, PAHs, Pb, Cr, Hg, VOCs			H

No.	Uncertainty	Recommended Resolution/ Responsibility	Type of info required	Quality	Quantity	Priority
		has occurred from leaks. If find COCs at outfall only, delineate as described for WP003. If find COCs at either location, collect soil data every 75 lineal feet (targeted to include up and downgradient from manholes).				
19	SS008 Pipeline (Diesel fuel only) Portions of pipeline remain. Is there residual fuel in the pipeline? What is condition of remnant pipeline (i.e., capped? Open-ended?, valve locations?) What is extent of contamination at fill stand?	ADEC, Air Force, and contractor walk length of pipe with assistance of pipe locater during site visit. Photo- documentation required. Based on visit, may sample around valves and cold tap low points in pipe to see if product remains. Where pipeline has been removed, sample where visual evidence indicates staining. Fill stand, delineate vertical and lateral extent of existing contamination. If extent of source indicates potential exposure to marine organisms, collect sediment data to determine risk.	Soil samples for DRO, GRO, BTEX, PAHs			M
20	Heavy Equipment Storage near LF006. Determine extent of soil	Visual inspection of the site. Use 3 test pits to look for buried debris and fuel related constituents. One location to be previous sample	Soil data for DRO, GRO, RRO, BTEX, PAHs, lead			M

No.	Uncertainty	Recommended Resolution/ Responsibility	Type of info required	Quality	Quantity	Priority
	contamination and whether groundwater contamination is present. Determine whether the depression that appeared to contain debris was a disposal area.	location with DRO hit. One sample collected at bottom of each test pit . Document contents of debris, if any. For COC hits, remove areas that may be limited soil contamination areas. Collect confirmatory samples. If extensive soil contamination (i.e., more than 10 super sacks roughly 10 cubic yards, or contamination extent goes to saturated soil), delineate extent to ADEC Method 2 criteria considering groundwater pathway. Collect groundwater sample. If groundwater above ADEC criteria, delineate downgradient extent (or to surface water). If groundwater exits to surface water, collect sediment samples for risk assessment.	Potential GW, SW and sediment data			
21	Quarry Area	Site inspection to determine visual evidence of buried debris				L

Acronyms and Initialisms

ADEC	Alaska Department of Environmental Conservation
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
COC	Chemical of Concern
Cr	Chromium
DRO	Diesel Range Organics
GRO	Gasoline Range Organics
GW	Groundwater
Hg	Mercury
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PCB	Polychlorinated Biphenyls
RRO	Residual Range Organics
SI	Site Inspection
SVOC	Semivolatile Organic Compounds
SW	Surface Water
VOC	Volatile Organic Compound