



North River RRS Conceptual Site Model Presentation

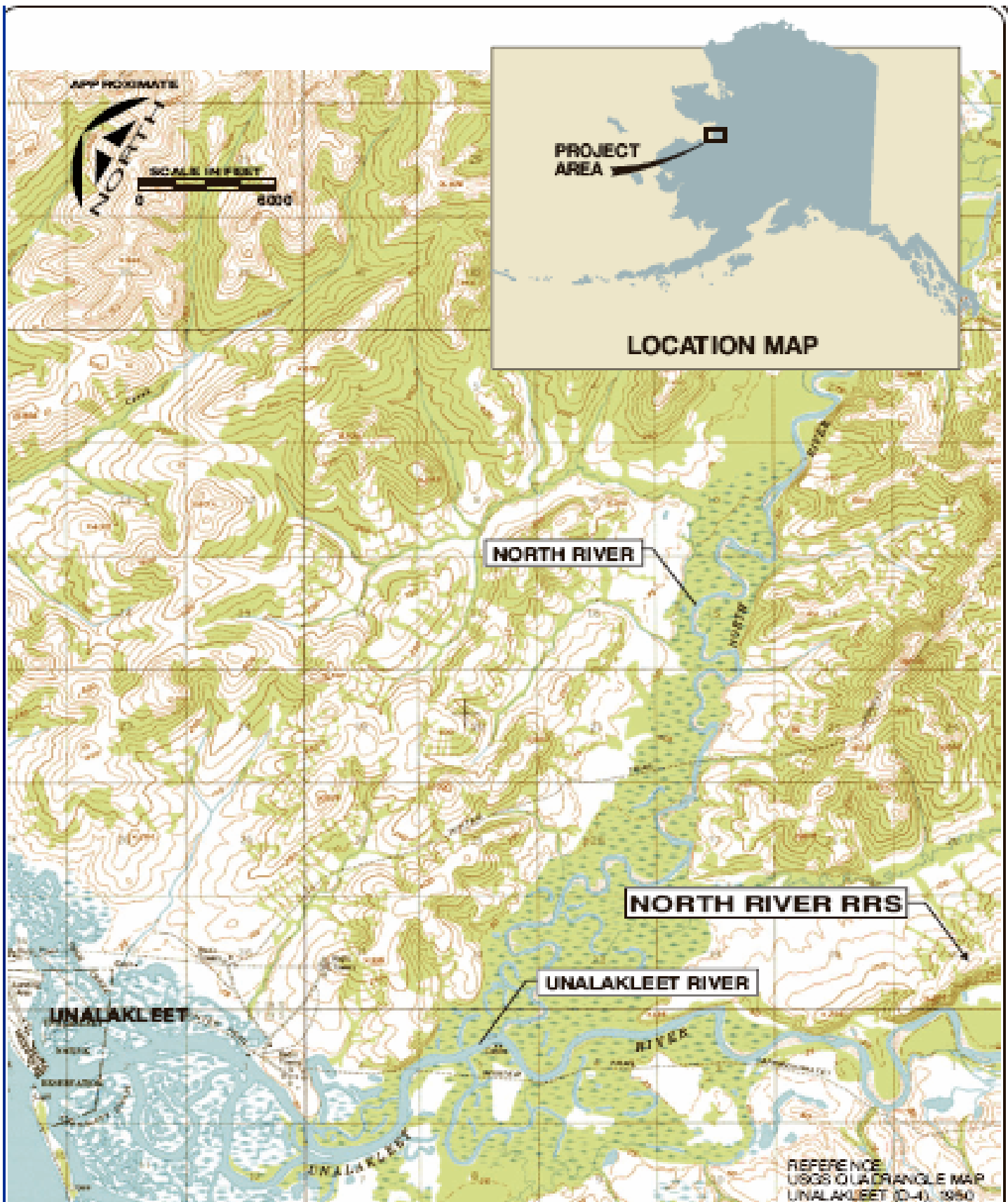


FIGURE 1-1

U.S. AIR FORCE
NORTH RIVER RADIO RELAY STATION - SITE INVESTIGATION REPORT
**PROJECT LOCATION AND
VICINITY MAPS**



MWH
Anchorage, Alaska

Facility History

- Constructed between 1956 and 1957 as a White Alice Communications System (WACS)
- Operated until 1978
- Site consisted of 2 barracks, generator building, warehouse, upper and lower pumphouses, and a maintenance building

1974 Aerial

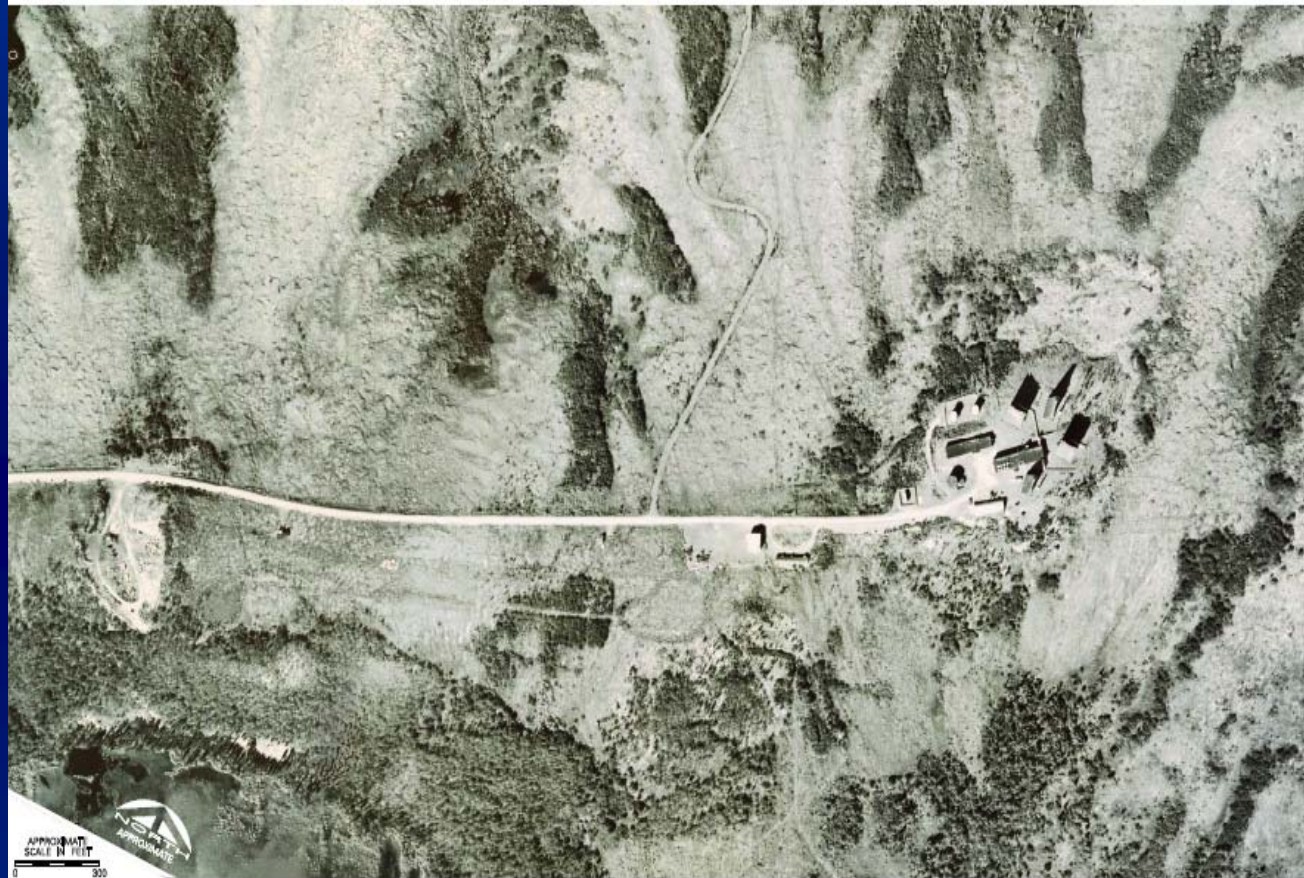


FIGURE
U.S. AIR FORCE
NORTON RIVER RADAR RELAY STATION
AERIAL PHOTO - 1974

Current Site Conditions



Stakeholders

- US Air Force (CES)
 - US EPA
 - ADEC
-
- US Fish and Wildlife
 - BLM
 - Unalakleet Native Corporation

Demographics

- ❖ Unalakleet, a native village is located 8 road miles from site – accessible via gravel road
- ❖ 216 acre site is owned by the Air Force but is adjacent to land owned by Unalakleet Native Corporation and privately owned allotments

Driftwood Bay RRS Environmental Setting

- **Climate – Subarctic with maritime influence**

- Winter temperatures -4°F to 11°F, extreme low -50°F.
- Summer temperatures 47°F to 62°F, extreme high 87°F.

Average annual precipitation (under 40 inch zone):

- Winter 41 inches snow
- Summer 14.2 inches

Geology – Lower Yukon Subregion.

- Primarily sands and gravels overlying sedimentary and metasedimentary rocks
- Soils at lower reaches are talus, fluvial, alluvial deposits of calu, sand, silt , and gravel – 10 feet thick

Hydrogeology

- Permafrost present, but not observed at 15 feet at the site
- Groundwater not generally used for water supply
- No wells on site
- Well points infrequently used to supply cabins

Hydrology

- RRS location on topographic high point
- Surface water enters Little North River or Unalakleet River

Driftwood Bay RRS Ecological Environment

- **Unalakleet identified as Important Use Area**

- **Mammals: Brown bear, caribou, moose, rabbit**
- **Birds: Grouse, ptarmigan, raven, jaeger, sparrow, songspur, snow bunting, and spruce hens**
- **Raptors: Gyrfalcon, merlin, marsh and rough-legged hawks, golden eagle**

- **Harvesting of berries and other subsistence plants is conducted**

- **Adjacent to wetland that are tributary to Unalakleet River**

- **Unalakleet River heavily fished – subsistence fishing accounts for approx 20,000 fish/year from river**

Regulations and Guidance

- ❖ Sites where are Environmental Restoration Account (ERA) eligible - actual/potential releases of hazardous substances at sites prior to January 1984
- ❖ IRP site - all investigation work conducted under CERCLA regulations/guidance
- ❖ State –POL sites

ADEC Method 2 Soil Criteria in mg/kg

	Ingestion	Inhalation	Migration to GW
DRO	8250	12,500	230
RRO	8300	22,000	9,700
Lead	400	400	
PCB	1	1	1

Environmental Restoration Activities

- 1984 – All hazardous materials removed
- 1985, 1989 - Site visits
- 1993 – Sample collection
- 1994- PA
- 1995 – Buildings demolished
- 2002 – Drum/soil removal at SS001
- 2003 – Phase 1 TCRA soil/vegetation removal
- 2004 – Site investigation Field work
- 2004 – Phase 2 TCRA removal
- 2005- TCRA followup

Site Reports

- 1986 Site Inventory Report
- 1991- Inventory Report (USACE)
- 1993 Site visit, Sample collection, and Hazardous Waste Inventory
- 1994- Preliminary Assessment
- 1996 – Final Remedial Action Report
- 1997 – Demolition and Cleanup Report
- 2005- Site Inspection Report
- 2006 – Followup PCB Contaminated Soil removal

Sites

- OT001 - White Alice Communications Site (WACS)
- SO001 - Vehicle Maintenance Building Underground Storage Tank
- SS002 – Aboveground Storage Tank Pit
- SS003 - Drums and Stained Soil (Area A)
- SS004 - Drums and Stained Soil (Area B)
- SS001 - Drum Storage Yard and PCB Trail (Area C)
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Area C

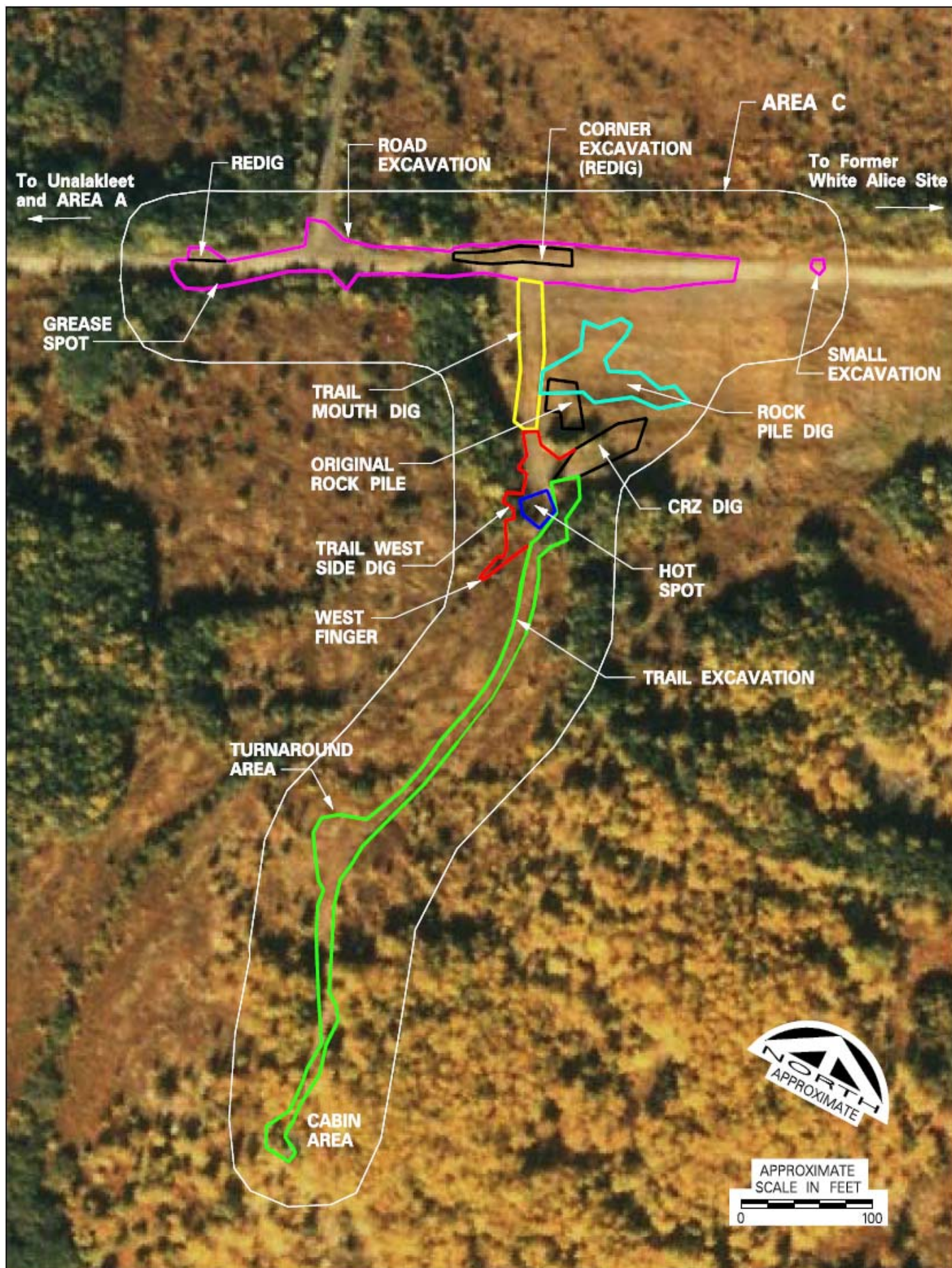


Area C

- Found by a resident in 2003
- TCRA with cleanup goal of 1 ppm for PCBs
- PCB contamination above 800 mg/kg remain
- DRO at 4,560 mg/kg also present

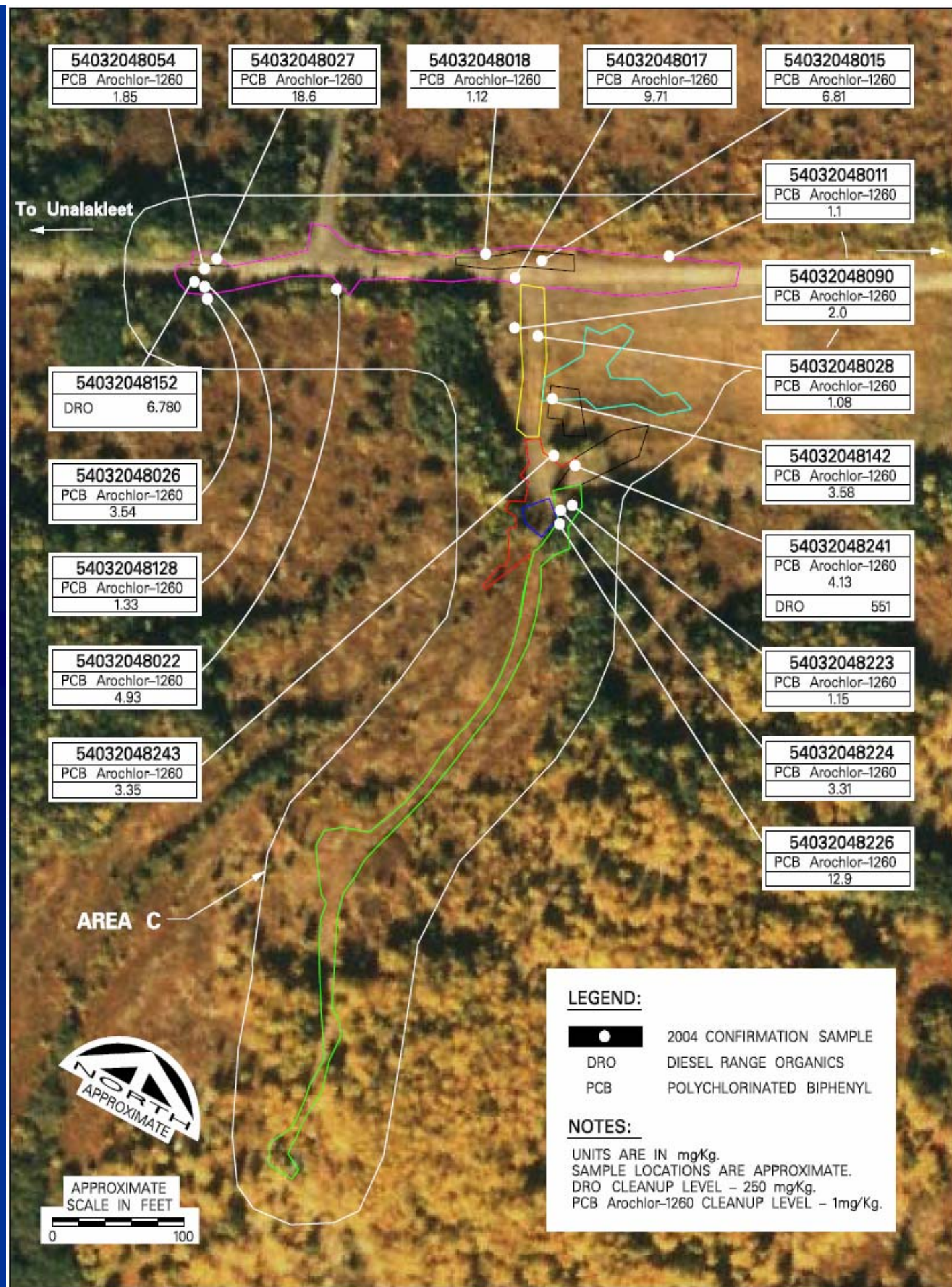
TCRA Sampling

- Soil samples collected every 50 feet within 20 feet of centerline of roads/trails –ran using on-site laboratory
- Vegetation samples taken along the road – fixed laboratory
- Initial removal in two phases
 - 2003 – 17 tons removed
 - 2004 – 630 tons removed
- Approx 75 tons left in place since at depth of six feet (geotextile placed under backfill)
- 45 tons (35) of stockpiled soils remained in place in 2004
- Security fence established and soil stockpile cover



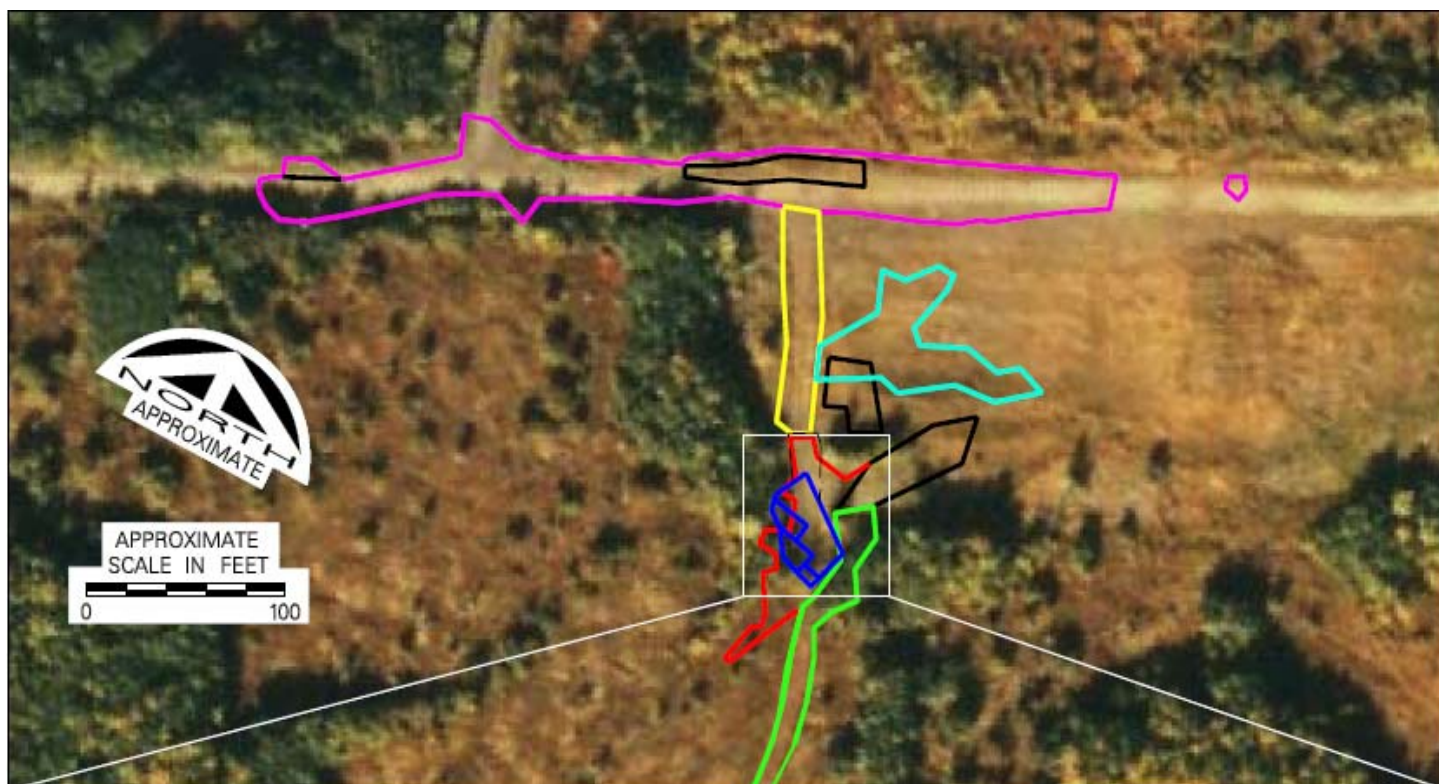
2004 Confirmation Sample results

- 18 samples above Method 2 values
- PCB: 1.12-18.6 ppm



2005 TCRA followup activities

- Removed soil from stockpile and 6 inches below
- Confirmation sample beneath stockpile contained PCBs at 9.74 ppm
- Continued excavation of hot spot area and Re-dig site (3-6')



NORTH RIVER 2005 SAMPLE DATA

Sample	Location	PCB Arochlor-1260
55018058002	Surface peat in roadway	4.59
55018058003	Surface peat in roadway	5.13
55018058004	Black shale, west side excav.	0.089(U)
55018058005	Peat in excavation bank	0.514
55018058006	Clay in bottom of deep excav.	213
55018058007	Floor of road excavation	8.64
55018058008	Floor of road excavation	1.46
55018058009	Floor of road excavation	0.083
55018058010	Floor of road excavation	9.69
55018058011	Black shale, east side excav.	7.7
55018058012	Peat in pit floor	840
55018058013	Resample of redug area	0.121
55018058014	Resample of redug area	0.106
55018058015	Floor of road excavation	0.262
55018058016	Duplicate of # 15	0.054(U)
55018058017	Floor of road excavation	0.057(U)
55018058018	Floor of road excavation	9.74
55018058019	Floor of east bank	20.9
55018058020	Duplicate of # 19	1.12

Units are mg/Kg
(U) = analyte undetected

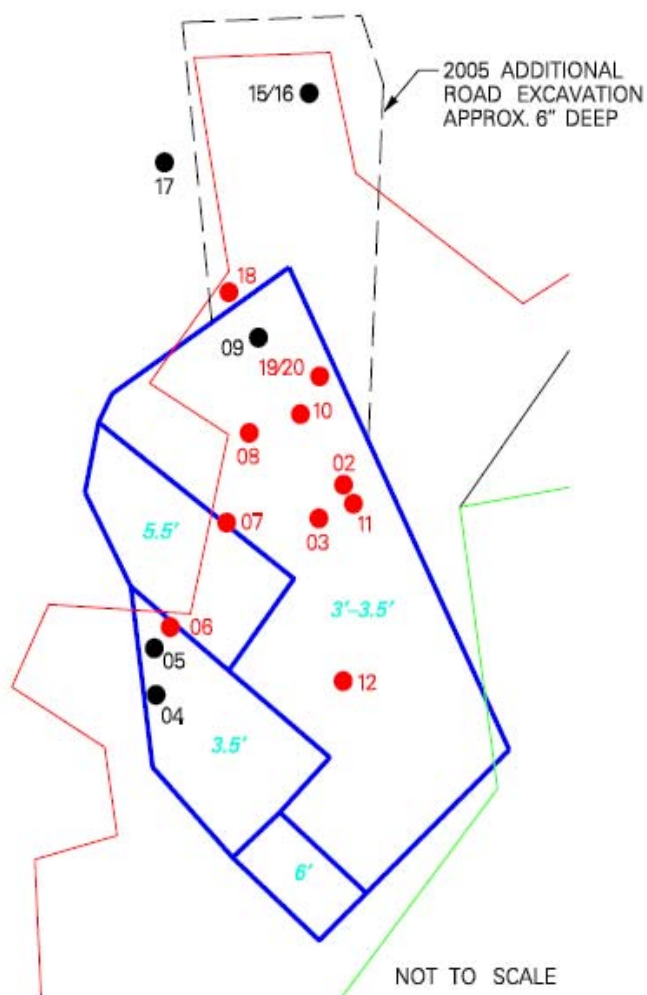
LEGEND:

— 2005 CONTINUED
HOT SPOT EXCAVATION

3.5' DEPTH IN FEET

● 2005 SAMPLE LOCATION
WITH PCBs <1 mg/Kg

● 2005 SAMPLE LOCATION
WITH PCBs >1 mg/Kg

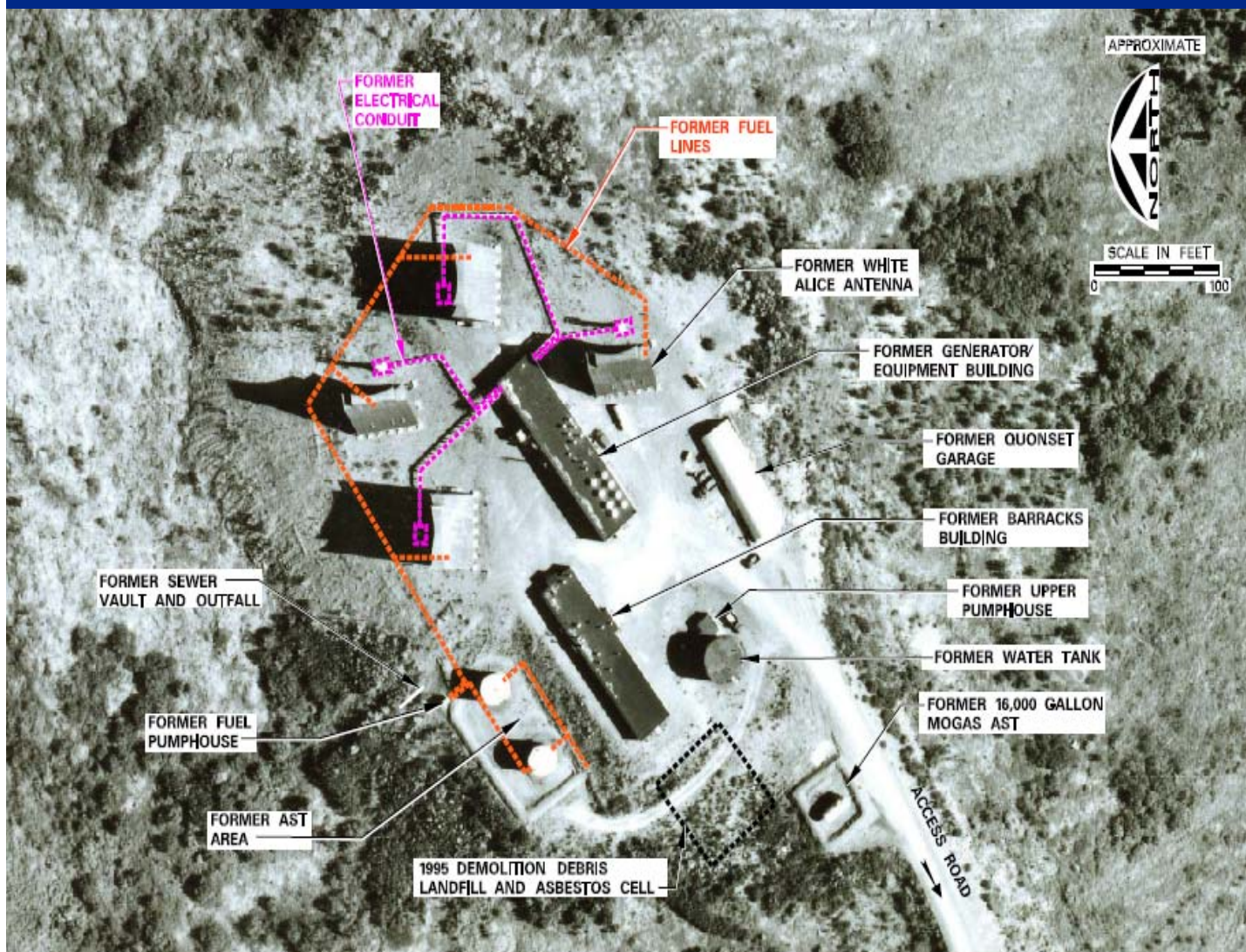


2005 Sample results

- PCB exceedences ranged from 1.46 -513 ppm
 - 1,2,4-Trichlorobenzene detected above ADEC limits in sample with highest PCB hit (003)
 - 1,2-dichlorobenze, 1,2,4-trichlorobenzene, and 1,4 dichlorobenzene detected in floor sample (008) below ADEC limits
 - DRO/RRO in floor sample (19) at 197ppm
 - Further excavation to the NE required to achieve Method 2
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- Samples from Redig site were below ADEC Method 2

OT001 White Alice Site



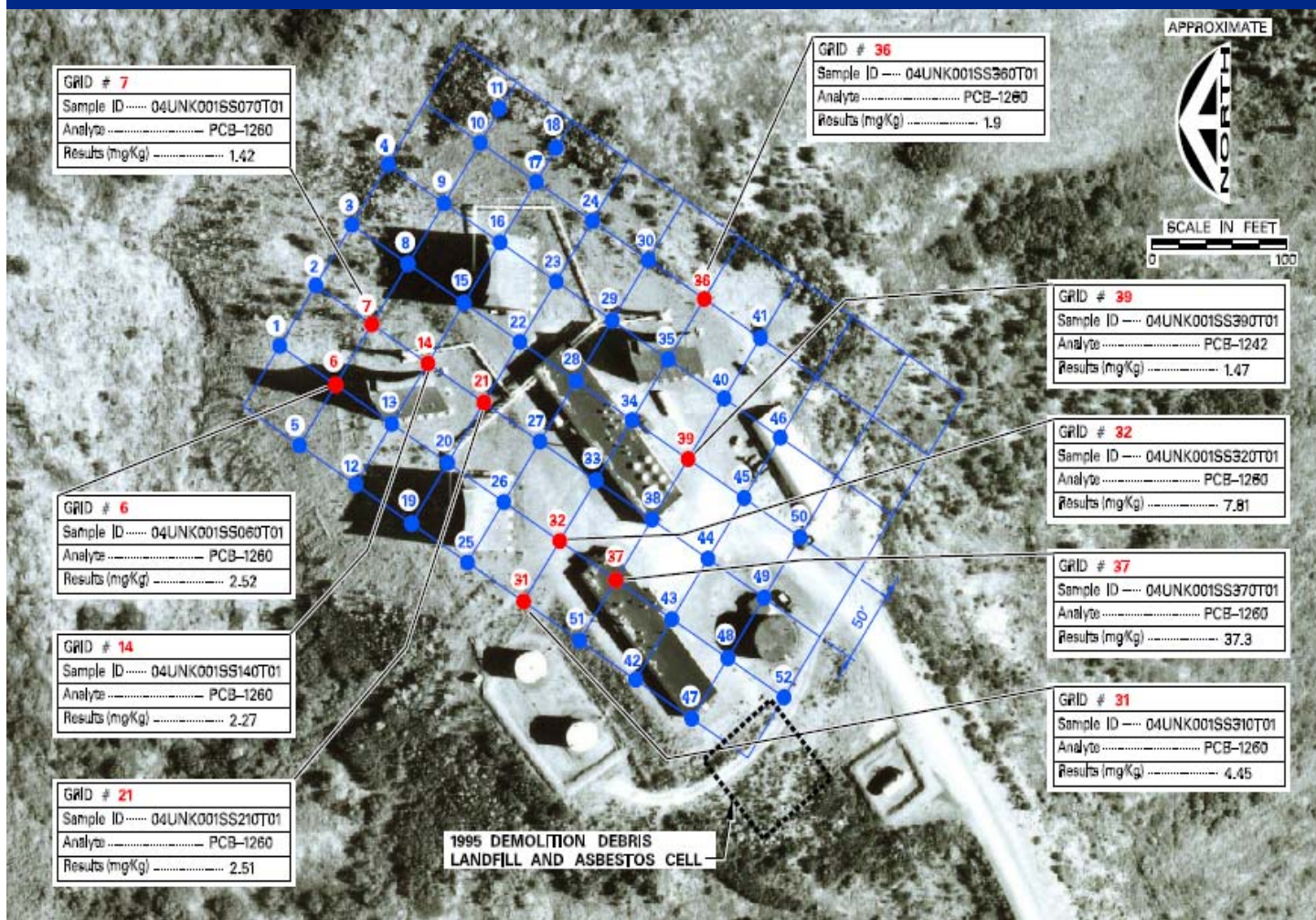


Previous Investigations near Former Structures

- Fuel Pumphouse : 3 soil samples - PCBs ND, DRO max 1,420 ppm
- Sewer Outfall – 40 CY removed in 1993, Confirmation samples (PCBs/ DRO) ND
- AST Area – 3,000 CY removed in 1995. Confirmation samples for DRO below 2,000 ppm
- Quonset Garage- 1 sample – DRO = 73 ppm
- Lower Pumphouse – Hot spot removed, confirmation sample ND
- Water Tank – PCB capacitors/transformer removed – soil sample ND
- Barracks Building – Asbestos removed
- Generator/Equipment Building – Asbestos, oil and generators removed
- Landfill – relocated

SI Sampling

- Grid sampling using 50 foot grids established over 130,000 sf for PCB testing
 - 52 surface soil samples collected for PCBs
- 5 test pits excavated from 2-15 feet bgs, until GW or refusal encountered
 - Soil samples collected at 2' intervals and screened with PID
 - Top, bottom, and highest PID hit sample submitted for GRO, DRO, RRO, VOCs, SVOCs, PCBs, pesticides, and RCRA metals



LEGEND:
● PCB SAMPLE LOCATIONS
● PCB SAMPLE LOCATIONS WITH RESULT ABOVE
ADEC METHOD TWO CLEANUP LEVEL OF 1.0 mg/Kg
mg/Kg MILLIGRAMS PER KILOGRAM
PCB POLYCHLORINATED BIPHENYL

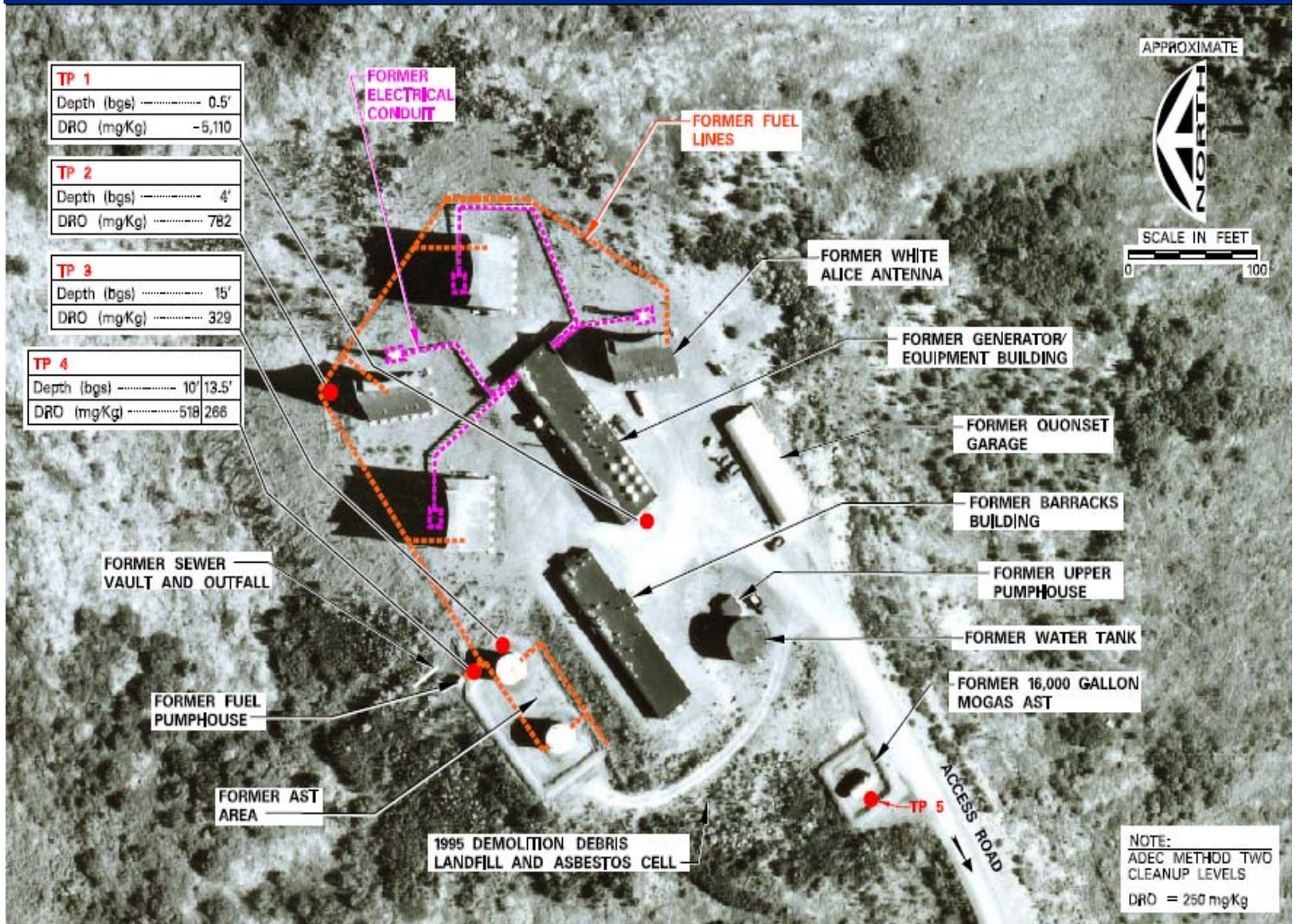
FIGURE 3-1
U.S. AIR FORCE
NORTH RIVER RADIO RELAY STATION - SITE INVESTIGATION REPORT
FORMER WACS - PCB SAMPLING GRID LOCATION
WITH RESULTS ABOVE 1.0 mg/Kg

PCB sampling results

Location	Conc in ppm (1260)
SS06	2.52
SS07	1.42
SS14	2.27
SS21	2.51
SS31	4.45
SS32	7.81
SS36	1.9
SS37	37.3
SS39	1.47 (1242)

Samples hottest near barracks
building/AST storage area

Test Pit sampling



LEGEND:

● TEST PIT LOCATION
bgs BELOW GROUND SURFACE
DRO DIESEL RANGE ORGANICS
mg/Kg MILLIGRAMS PER KILOGRAM

FIGURE 3-2
U.S. AIR FORCE
NORTH RIVER RADIO RELAY STATION - SITE INVESTIGATION REPORT
FORMER WACS TEST PIT LOCATIONS

Sample Results

Test Pit	Location	Depth	DRO in ppm
1	Generator Building	0.5 (rest clean)	5110
2	Near antenna	4.0 (rest clean)	782
3	AST storage area	15	329
4	Pump house	10	518
		13.5	266

- As: 2.56-15 ppm
- Cr: 22.9 – 49.1 ppm

SO001 - Vehicle Maintenance Building



SO001 Previous Investigation

- 1995 - removal of 125 CY of POL soil during removal of former 500 gal UST/piping
- Confirmation samples max = 11,900 ppm DRO at 7 feet
- 2002 - 3 drums/stained soil removed – contaminated soil located near trail to resident cabin
- Additional soil sampling/TCRA discussed as Area C

SI Sampling

- 5 test pits excavated from 2-15 feet bgs, until GW or refusal encountered
 - Soil samples collected at 2' intervals and screened with PID
 - Top, bottom, and highest PID hit sample submitted for GRO, DRO, RRO, VOCs, SVOCs, PCBs, pesticides, and RCRA metals

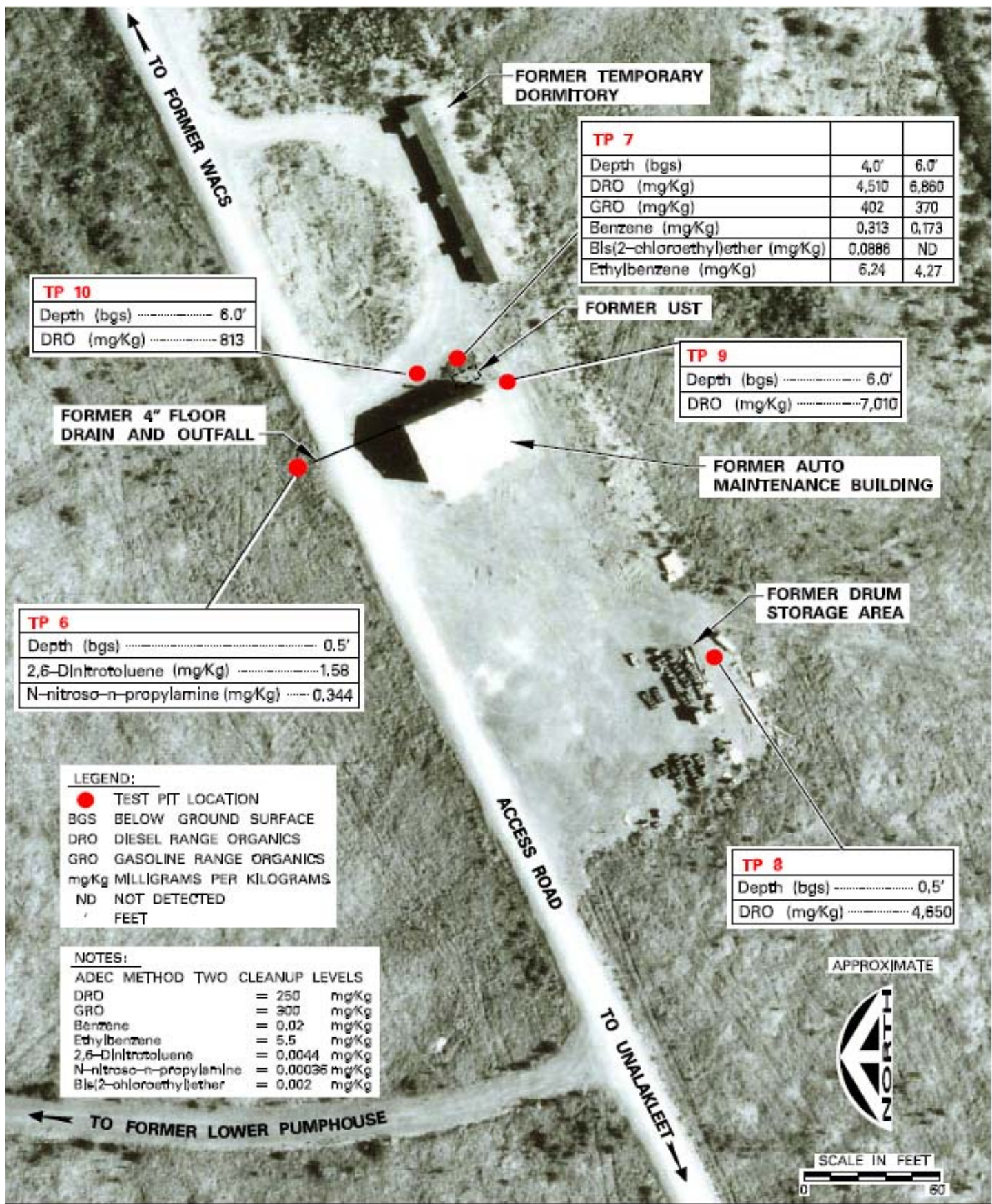


FIGURE 3-3

U. S. AIR FORCE
NORTH RIVER RADIO RELAY STATION – SITE INVESTIGATION REPORT
**FORMER MAINTENANCE FACILITY
TEST PIT LOCATIONS**

DRO and Metals Sample Results

Test Pit	Location	Depth in feet	DRO in ppm
7	Near UST	4	4,510 /6,330
		6	3,640 /6,860-
8	Drum storage	0.5 (rest clean)	4,650
9	Near Building	6	7,010
10	Near UST	6	813

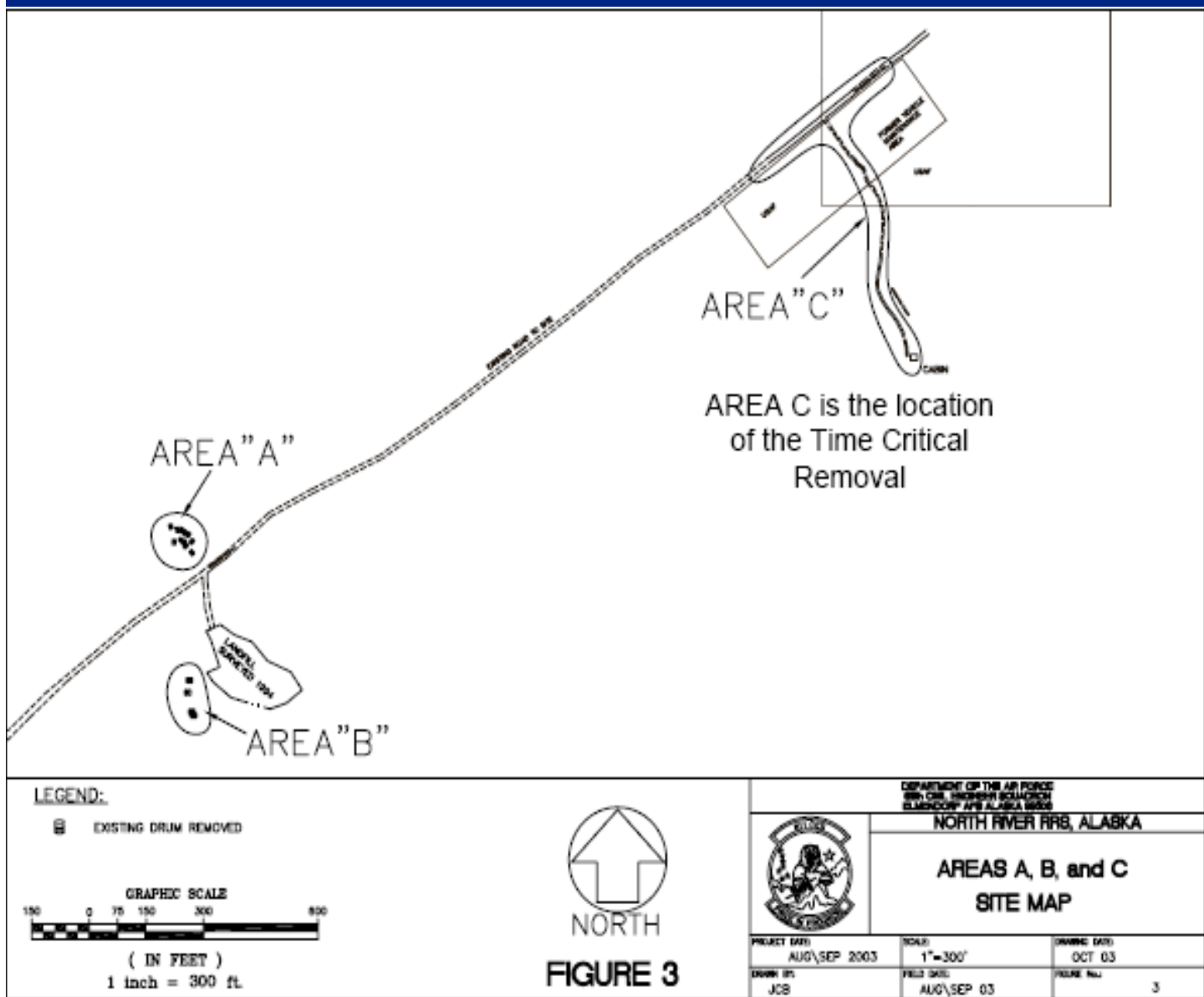
- As: 2.0 – 31.4 (max TP07) ppm
- Cr: 25.2 – 38.5 ppm

Other Compounds above ADEC criteria

- TP06 at 0.5 feet (near outfall)
 - 2,6 – Dinitrotoluene: 1.58 ppm
 - N-nitroso-di-n-propylamine: 0.344 ppm
- TP07
- At 4.0 feet
 - GRO: 402/662 ppm
 - Bis(2-chloroethyl)ether: 0.0886 ppm
 - Benzene: 0.313/0.401 ppm
 - Ethylbenzene: 6.24/5.02 ppm
- At 6 feet
 - GRO: 370/319 ppm
 - Benzene: 0.173/ND ppm

SS002 – Aboveground Storage Tank Pit

- Site was initially planned to be the debris landfill for 1996 North River RRS demolition.
- During landfill construction PCS found – approx. 3000 CY soil was removed
- (DRO) over the 250 mg/kg ADEC cleanup level in confirmation samples.



SS003 (Area A) - Drums and Stained Soil



Area A

- This site was identified in 2003 during an investigation by the USACE.
- PCBs detected at 122 mg/kg which is over the State cleanup level of 1 mg/kg
- Several drums were removed from Area A and petroleum contaminated soil was identified in association with the drums.

SS004 (Area B) – Drums and Stained Soil

- Site identified in 2003 during an unrelated investigation by the USACE.
- Several drums were removed
- Soil samples contains DRO at 22,400 mg/kg

Project Constraints

- ❖ Funding/Schedule
- ❖ Land Transfer requirements
- ❖ Land Use Controls
- ❖ Real Estate issues
- ❖ Past Precedents
- ❖ Litigation Potential
- ❖ Weather
- ❖ Logistics

Funding

- Available for SSI/RI in 2007
- Removal funding?

Land Transfer Requirements

- BLM needs based on future user needs
- F&W requirements
- Air Force policy requirements
- Legal definition of property boundary