

**Proposed Spill Site Concentrate Recovery Program, Winter 2003  
Cape Krusenstern National Monument, Alaska.**

31 March 2003

Prepared for:

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Prepared by:

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## **Introduction:**

During the summer of 2002 the current site conditions at the historic concentrate haul truck spill sites were systematically assessed, as discussed in the (Draft) Spill Site Characterization Plan (Exponent, 2002b), to determine the adequacy of the clean-ups at each site and to characterize current (2002) site conditions. Figure 1 indicates the locations of all the historic concentrate spill sites along the DMTS roadway.

At two sites within the Cape Krusenstern National Monument, SP-03 and SP-05 (located at mile posts 4.05 and 4.95 respectively), unrecovered spill-related zinc concentrate was found at concentrations warranting additional concentrate recovery. At each of these two locations a portion of the areas from which the concentrate is to be recovered is too far away from the DMTS roadbed to be excavated by equipment while still on the road. Both will require use of a track-mounted back-hoe / excavator which will have to be driven at least partially on to the spill site to conduct the excavation. All mechanized activities, however, will be confined to the footprint of the recovery area, in order to prevent damage to the surrounding tundra. Both sites are located in relatively flat areas, and because of this minimal effects of erosion are expected.

## **Definition of Area to be Recovered:**

Target clean-up threshold levels are those listed in Method 2 "Arctic Zone" per 18 AAC 75 ADEC, 1999). For the metals of concern the threshold levels are: 1,000 mg/kg lead, 41,000 mg/kg zinc and 140 mg/kg cadmium. These Arctic Zone threshold levels are those used to define the areas to be recovered and will be the threshold standards met during excavation and recovery.

At each of the 2 sites, the areas to be excavated, as defined by the 2002 characterization sampling, have been outlined on the ground with wooden lath and/or re-bar stakes. GPS coordinates for the Grid Reference Monument at each site and a map indicating the locations of the excavation defining stakes relative to the Grid Reference Monument at each site are given in the 2 relevant (Draft) 2002 DMTS Concentrate Spill Site Characterization Reports (TCAk 2003a and 2003b). Sketch maps for each site are attached.

At SP-03 the recovery area is about 50 feet by 15 feet in size. At SP-05 the recovery area is about 20 feet by 30 feet in size. It is expected that tundra material and soils will have to be removed to a depth of about 1 foot at each site to insure adequate clean-up, resulting in approximately 28 yards of excavated materials being removed from SP-03 and approximately 22 yards removed from SP-05.

At site SP-05 there is also a roughly 15 foot by 15 foot 'pond', approximately 1-3 feet deep that lies in the middle of the historic spill recovery area (see photograph, attached). This 'pond' appears to be the result excavation and removal activities that occurred subsequent to the spill in 1990. The 2002 characterization sampling (Teck Cominco, 2003b) indicates that the 'pond' and immediate vicinity are free of unrecovered spill concentrate, but because it lies immediately adjacent to the roadbed some excessive sloughing of the road shoulder is occurring. This will also be restored while site SP-05 restoration is being conducted.

### **Recovery Procedures:**

The general procedure for spill concentrate recovery and recycling are described in the Concentrate Recovery and Recycling Plan and associated Addendum (Exponent, 2002a and Exponent 2003). Procedure modifications for winter recovery on the tundra are described below.

Prior to arrival of recovery equipment at the site, the Grid Reference Monument and spill marking stakes will be located and the area to be excavated visibly marked out on the snow.

A track-mounted excavator will be driven from the road out on to the frozen, snow covered spill site only as far as is required to safely and effectively reach the area from which the fugitive concentrate is to be recovered. The excavator will stay within the footprint of the area designated for recovery, beginning excavation at the furthest away areas and ‘retreating’ back to the road as the removal progresses. At site SP-05, the process will require that the ‘pond’ water (ice) be removed during the snow removal and clean-fill will be placed in the resulting hole prior to conducting the rest of the concentrate recovery excavation. It is estimated that 10-15 yards of new fill will be required to in-fill the ‘pond’ and replace the sloughed road shoulder and slope.

The covering snow and ice cover will be cleared from the marked concentrate recovery areas, loaded on to covered trucks and returned to the mine site for proper disposal. Although there are no indications that the covering snow contains unrecovered spill concentrate, the snow/ice disposal will be conducted as a conservative measure. The tundra and organic-rich soil materials will then be scraped up and removed from the ground utilizing the excavator. The excavator will be equipped with a bucket with minimal sized ‘teeth’ or a toothless ‘face plate’ to facilitate a cleaner excavation. The tundra will be excavated cleanly down to the inorganic soil surface (commonly 6-12 inches deep), or to a depth of at least 1 foot in areas of thicker tundra/peat development. Excavated materials will then be carefully loaded directly into haul trucks waiting on the road. If necessary, loose material will be hand shoveled in to the excavator bucket for loading on to the haul truck, to assure recovery of all the delineated tundra materials and to pick up any incidental spillage from the loading process.

Immediately following initial excavation of the area the newly exposed soil or tundra surface will be scanned in-situ for lead, zinc and cadmium content utilizing a portable XRF analyzer. If the presence of concentrate is detected at or above Arctic Zone thresholds an additional 2-4 inches of material will be removed, following the procedure described above. The newly exposed surface will again be scanned using the portable XRF. This process will continue until the spill concentrate has been successfully recovered. A ‘vac-truck’ may be employed, along with hand shoveling, for the final clean-up of tundra material which may have accumulated on the snow and tundra adjacent to the excavated site.

Recovered material will then be securely covered and trucked back to the mine for recycling following the procedures described in the Concentrate Recovery and Recycling Plan and Addendum (Exponent, 2002b and Exponent, 2003). Verification sampling and restoration of the site will then be undertaken as described below.

### **Verification Sampling:**

General procedures for verification sample collection, handling and laboratory analysis are detailed in the Concentrate Recovery and Recycling Plan (Exponent, 2002a) and the Spill Site Characterization Plan (Exponent, 2002b). These procedures, adapted as necessary for site-

specific conditions, will be completed prior to the emplacement of any fill materials during restoration.

Immediately upon completion of the excavation and after in-situ XRF scanning measurements have indicated that the fugitive spill concentrate has been successfully recovered the original sampling stations will be re-established and new samples collected from each location. These samples will be analyzed on site for lead, zinc and cadmium via ex-situ XRF methods and then sent off-site for laboratory confirmation analyses. Additional samples may also be collected and analyzed at the discretion of the crew in the field. All verification sample results will be recorded in the individual spill site files and reported to the appropriate state and federal agencies as required.

### **Restoration:**

Restoration will begin only after verification samples have been collected and ex-situ XRF analyses of these samples has confirmed that metal concentrations in the excavated area are below 'Arctic Zone' thresholds.

Clean fill material will be brought in and distributed so as to re-establish the original ground surface level. All fill materials to be used in the restoration (gravel and rock) will be sampled for lead, zinc and cadmium levels prior to emplacement on the tundra with results of that sampling included in each spill site report file. A total of about 50 yards of fill material will be required to replace the tundra materials removed during recovery excavation and an estimated additional 10-15 yards required for the SP-05 'pond' and road shoulder fill. This initial back-fill will be placed after the recovery excavation and verification sampling has been completed.

At an appropriate time, clean tundra soil materials will be brought in from a local source. Approximately 3-6 inches of this new material will be placed on top of the primary rock and gravel fill. The newly emplaced tundra soils will be allowed to re-vegetate naturally; no seed, fertilizer or other non-indigenous materials will be utilized.

### **Monitoring:**

Both sites are located in relatively flat areas (see photographs, attached), and because of this minimal soil erosion is expected. The reclaimed sites will be visited at the end of the summer to insure that no erosion of the fill materials is occurring and to monitor the natural re-vegetation progress. The natural re-vegetation progress will be monitored annually. Should the monitoring indicate this plan does not allow for adequate re-vegetation of the clean-up areas the NPS is open to exploring other methods of erosion control and re-vegetation (NPS, 2003).

### **Scheduling:**

Excavation and concentrate recovery at sites SP-03 and SP-05 is planned for early April, 2003 depending on receipt of the required permit(s), equipment and fill material availability, snow pack status and ground conditions. Tundra soil cover will be placed during the summer season (after break-up and snow melt).

**References:**

ADEC, 1999; 18 AAC 75: Oil and Hazardous Substances Pollution Control Regulations as Amended through January 22, 1999. Alaska Department of Environmental Conservation.

Exponent 2002a; Concentrate Recovery and Recycling Plan, Delong Mountains Regional Transportation System, Alaska. Prepared for Teck Cominco Alaska Incorporated by Exponent, Bellingham, Washington. June 14, 2002.

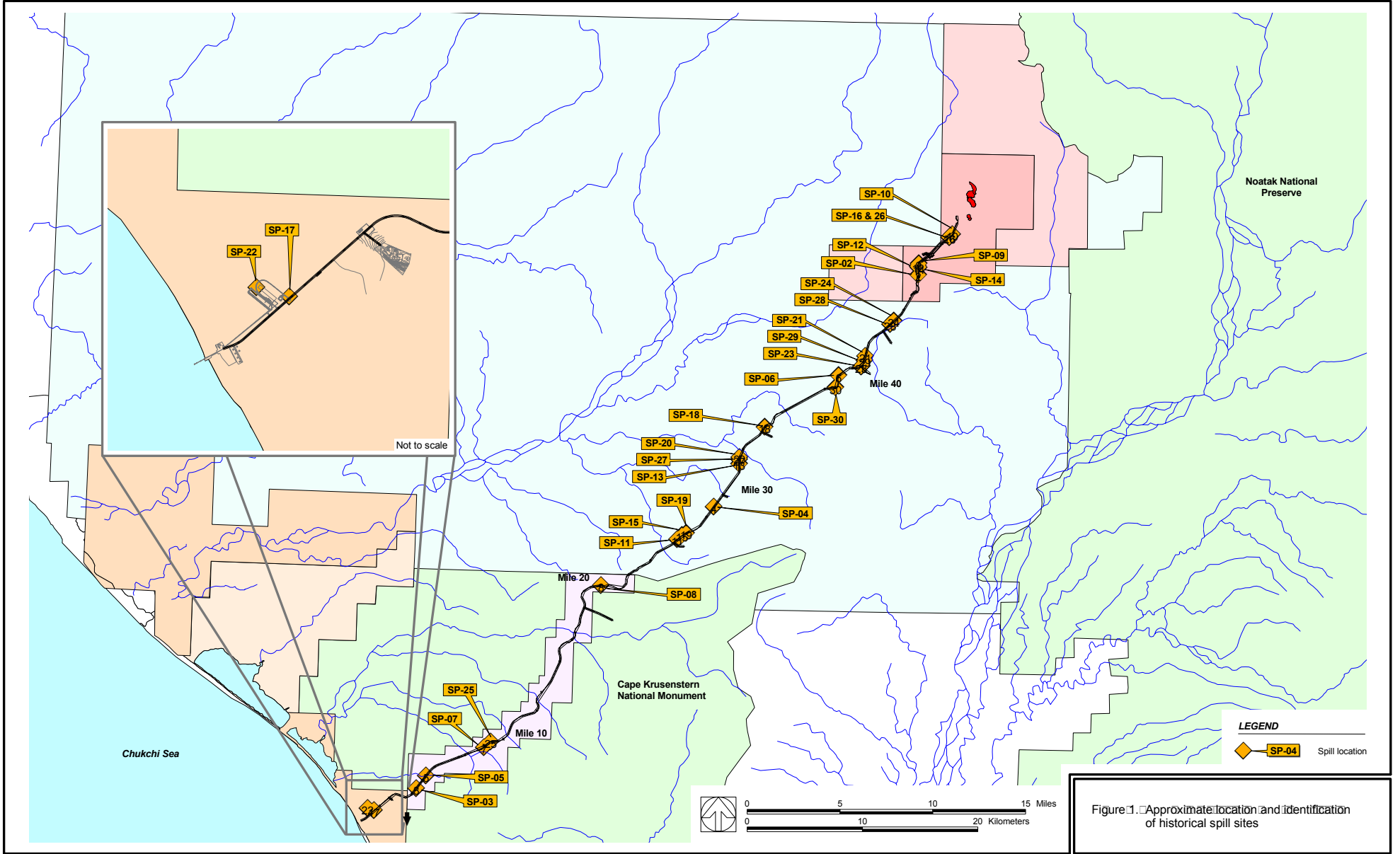
Exponent, 2002b; (Draft) Spill Site Characterization Plan, DeLong Mountains Regional Transportation System, Alaska, July, 2002. Prepared for Teck Cominco Alaska Inc., Anchorage, Alaska by Exponent, Bellevue, Washington. July 26, 2002

Exponent 2003; Addendum to the (2002) Concentrate Recovery and Recycling Plan, Delong Mountains Regional Transportation System, Alaska. Prepared for Teck Cominco Alaska Incorporated by Exponent, Bellingham, Washington. March, 2003.

NPS, 2003; Letter to Teck Cominco Alaska Incorporated, from Superintendent, Western Arctic National Parklands (D.S.Spirtes), 28 March 2003.

TCAk 2003a; (DRAFT) SP03 2002 DMTS Concentrate Spill Site Characterization Report. March, 2003.

TCAk 2003b; (DRAFT) SP05 2002 DMTS Concentrate Spill Site Characterization Report. March, 2003.





Site SP-05      August, 2002

Area of planned concentrate recovery is outlined by wooden lath stakes, based on results of the 2002 Characterization Sampling Program. The 'pond' is the one discussed in the report.



Site SP-03      January, 2003

Area of planned concentrate recovery is outlined by re-bar and wooden lath stakes, based on results of the 2002 Characterization Sampling Program.





SP03-B2

FILE NO. Red Dog Haul Road BY KMA

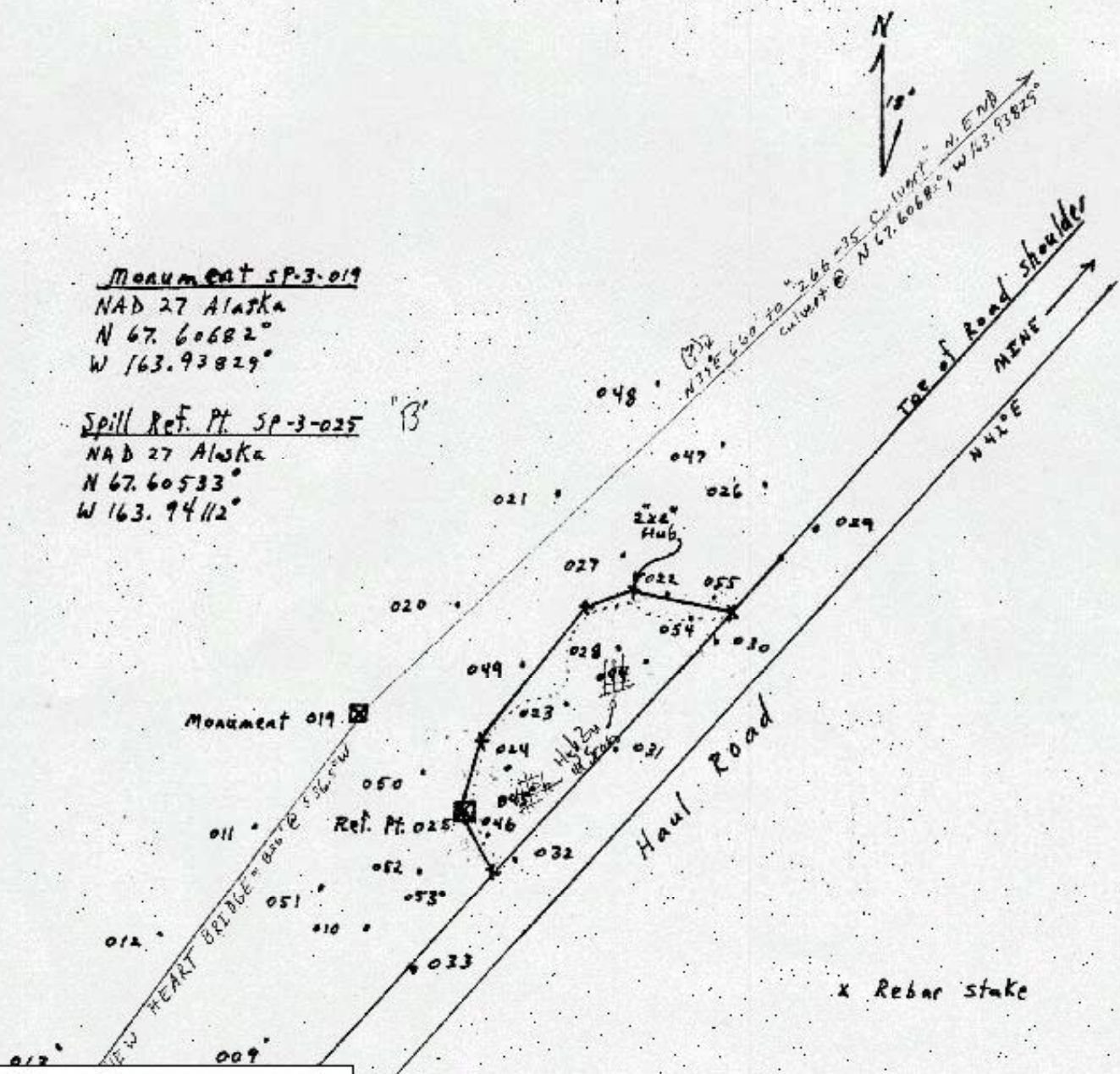
DATE 8-28-02

SUBJECT Concentrate Spill site #3  
Eastern Grid Extension

SHEET 2 OF 2

Monument SP-3-019  
NAD 27 Alaska  
N 67.60682°  
W 163.93829°

Spill Ref. Pt. SP-3-025 "B"  
NAD 27 Alaska  
N 67.60583°  
W 163.94112°



Teck Cominco Alaska

Rev. Date	By:	Noatak Dust Program

Field Map  
SP03-B3

SCALE  
1 inch = 25 feet  
KMA



**GPS COORDINATES (NAD 27 AK)**

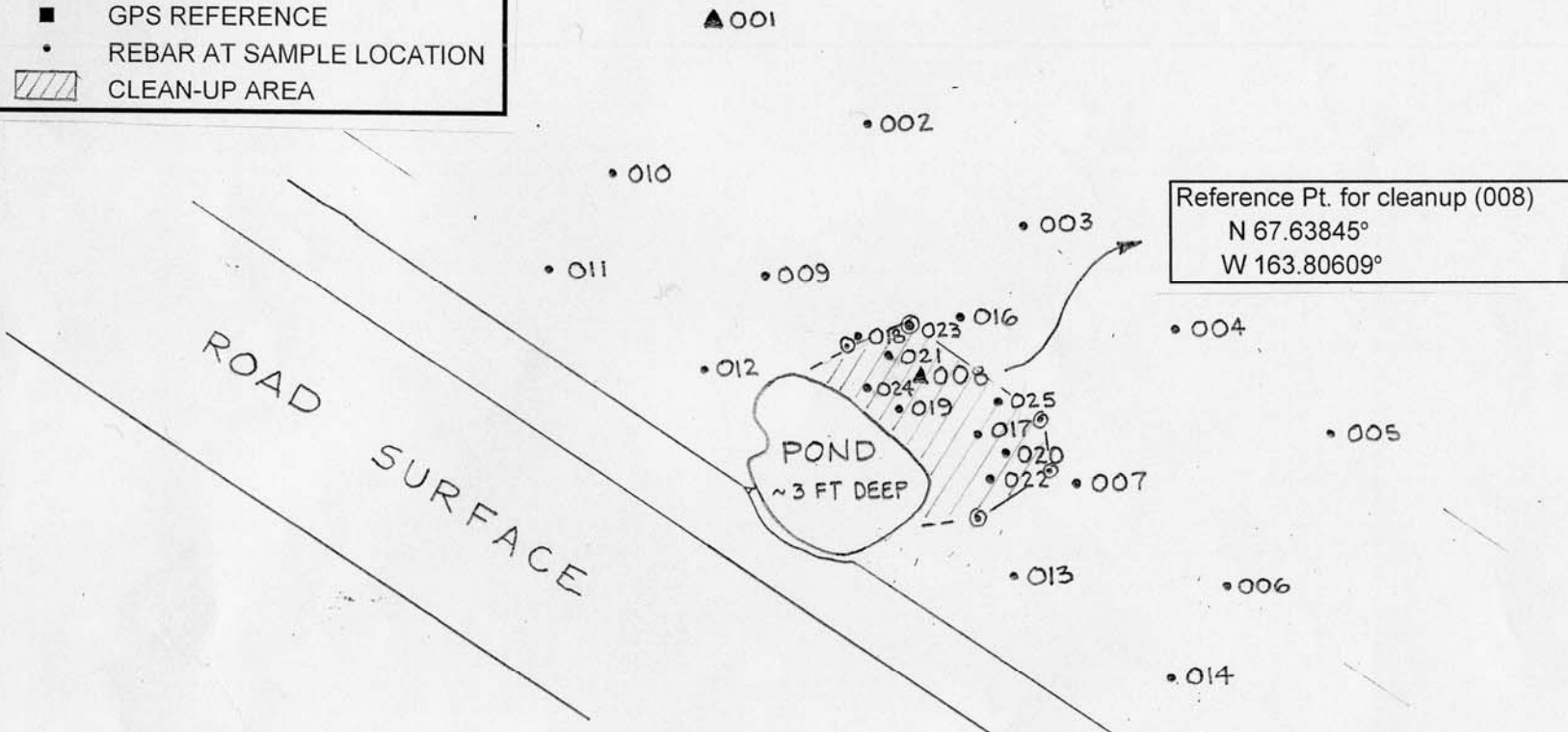
Monument 001 N 67.63845°  
W 163.80609°  
Milepost marker 21 N 67.XXXXXX°  
W 163.XXXXXXX°

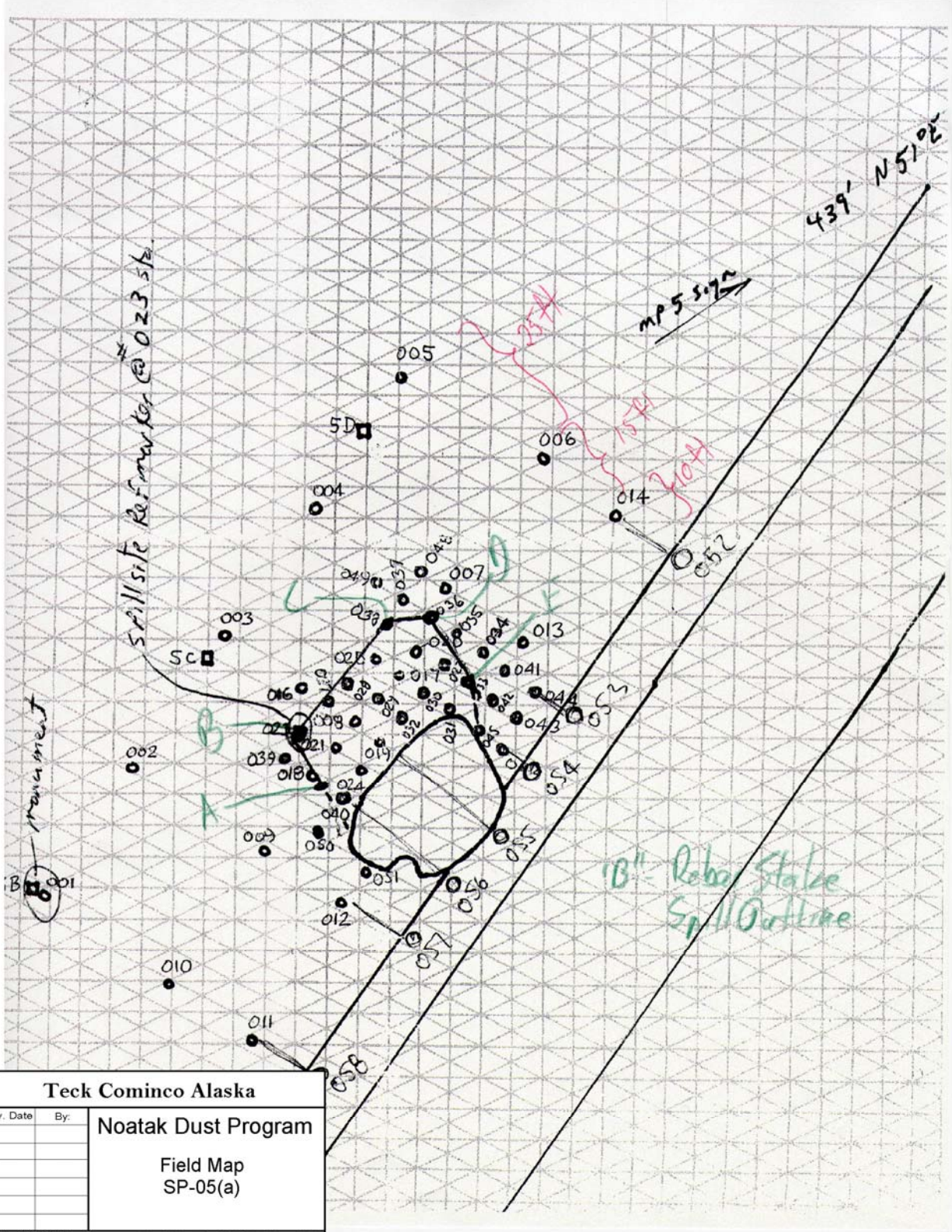


Approximate Scale

**LEGEND**

- SAMPLE LOCATION
- ▲ REFERENCE MONUMENT
- GPS REFERENCE
- REBAR AT SAMPLE LOCATION
- ▨ CLEAN-UP AREA





<b>Teck Cominco Alaska</b>	
Rev. Date	By:
<b>Noatak Dust Program</b>	
Field Map	
SP-05(a)	
Date: 12/1/2002	
By: Tallmadge GIS & Drafting, LLC	