

NOORVIK MATERIALS INVESTIGATION

Existing Alignment, Proposed Alignment and Material Sites

July 22 - 23, 1973

STATE OF ALASKA
DIVISION OF AVIATION
DESIGN SECTION

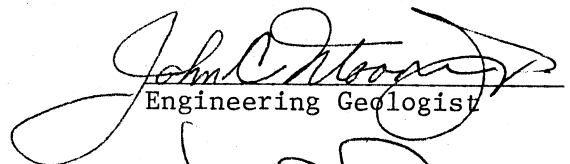
KOESTER

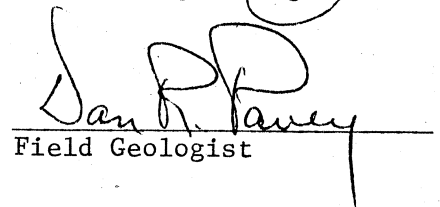
NOORVIK MATERIALS INVESTIGATION

Existing Alignment, Proposed Alignment and Material Sites

July 22 - 23, 1973

Approved:

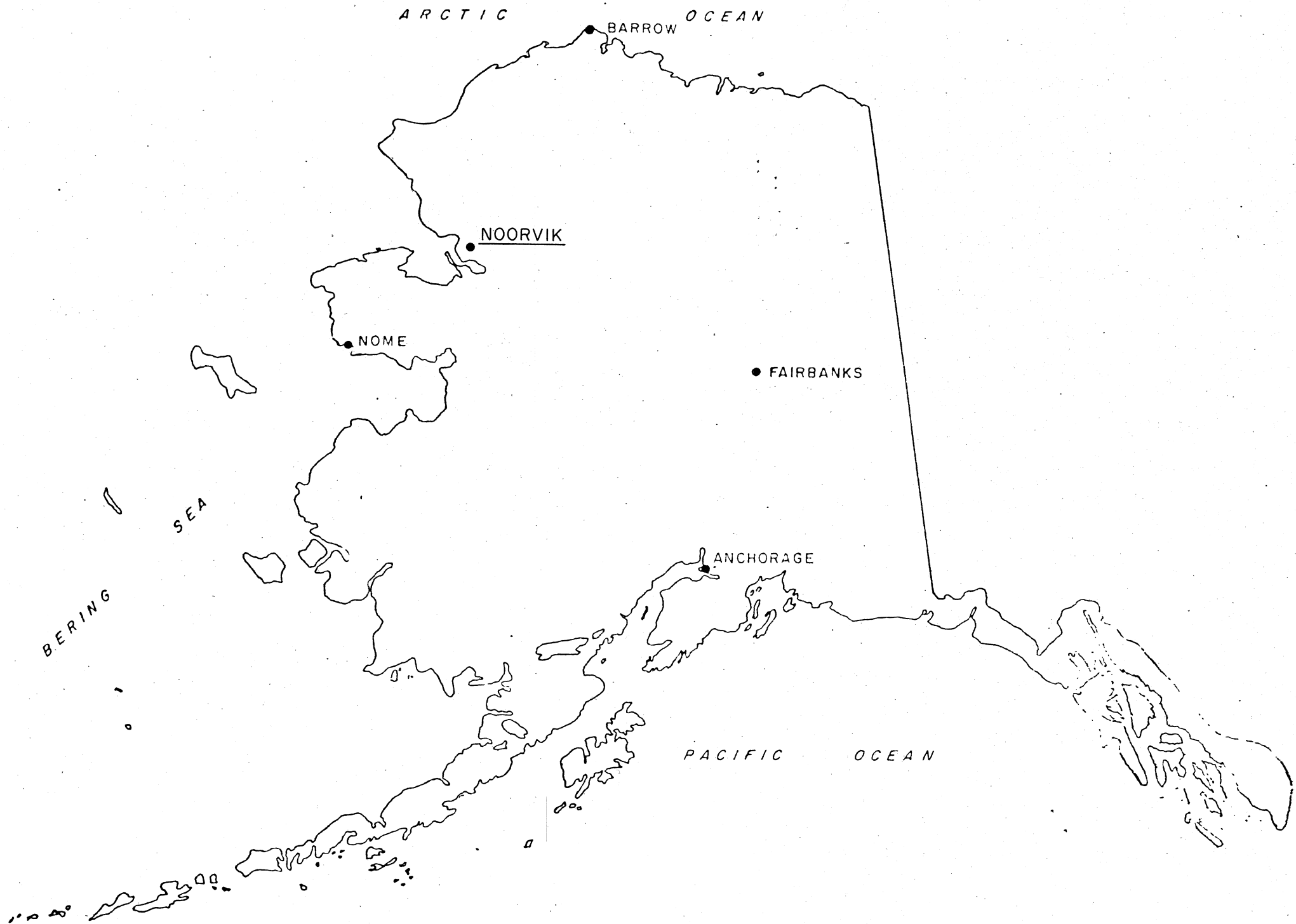

Engineering Geologist


Field Geologist

STATE OF ALASKA
DIVISION OF AVIATION
DESIGN SECTION

TABLE OF CONTENTS

Vicinity Map
Memorandum
Photographs
Test Hole Boring Locations
Soil Boring Logs
Lab Reports



STATE
of ALASKA**MEMORANDUM**TO: Clayton C. Hueners
Chief Design Engineer

THRU:

Jack Moores
Jack Moores
Engineering Geologist

FROM:

Dan Pavey
Dan Pavey
Field Geologist

DATE : December 4, 1973

SUBJECT: Noorvik Materials Investigation
Runway and BorrowINTRODUCTION

This memo covers the subsurface investigation of the existing runway, the proposed alignment and proposed borrow sources at Noorvik. Field work was completed on July 22 and 23, 1973 under the supervision of Field Geologist, Dan Pavey. Transportation of the field crew and drilling equipment from Kotzebue was provided by B & R Tug and Barge utilizing the tug "Agloo", a 73 foot converted landing craft.

Noorvik is located 40 air miles east of Kotzebue on the south bank of the Kobuk River. Transportation to Noorvik is by air or boat.

METHODS OF INVESTIGATION

A B-50 Mobil drill mounted on an FN-60 Flextrac Nodwell was utilized for sub-surface investigation. Sampling consisted of six inch solid flight auger. Samples obtained were examined in the field and forwarded to Anchorage for further testing. Test results are available on request.

EXISTING RUNWAY INVESTIGATION

The embankment consists of an average 2-1/2 feet of fine silty sand directly overlying original ground. Only trees and brush were removed during original clearing. The organics vary in thickness from 1/2 to 1 foot and overlie a fine frozen sandy silt. The sandy silt contains a high percentage of free ice.

The fine sandy silt comprising the embankment is quite susceptible to erosion by the wind. The villagers indicated that one to two feet of material has been lost from the runway surface since construction in 1966.

PROPOSED ALIGNMENT

A total of seven test holes were augered along the proposed centerline to a depth of ten feet. An organic mat one foot in thickness overlies frozen silt containing a high percentage of free ice and a trace of organic material. Ice lenses were encountered at Sta 7+50 and 19+00. At Sta 7+50, the lens is one foot thick and occurs immediately below the organic mat. At Sta 19+00, ice was encountered from 4.0 to 6.0 feet.

Vegetation along the centerline consists of a thin to medium stand of spruce and scattered shrubs. The spruce are ten to fifteen feet in height.

PROPOSED PARKING APRON

One test hole was placed in the vicinity of the parking apron. One foot of organic material overlies a frozen sandy silt containing a high percentage of free ice. Below four feet, the material changes to ice containing a trace of silt.

BORROW INVESTIGATION

Embankment material for construction of the original runway was obtained from the bluff along the northwest side of the village and consisted of a fine silty sand grading to a sandy silt. Material similar to this is available in a semi-drained lake bed one mile southeast of the village.

A deposit of fine sandy gravel grading to a gravelly sand suitable for topping material is located six miles southeast of the village. Three test holes were augered to a maximum depth of 35 feet at this location.

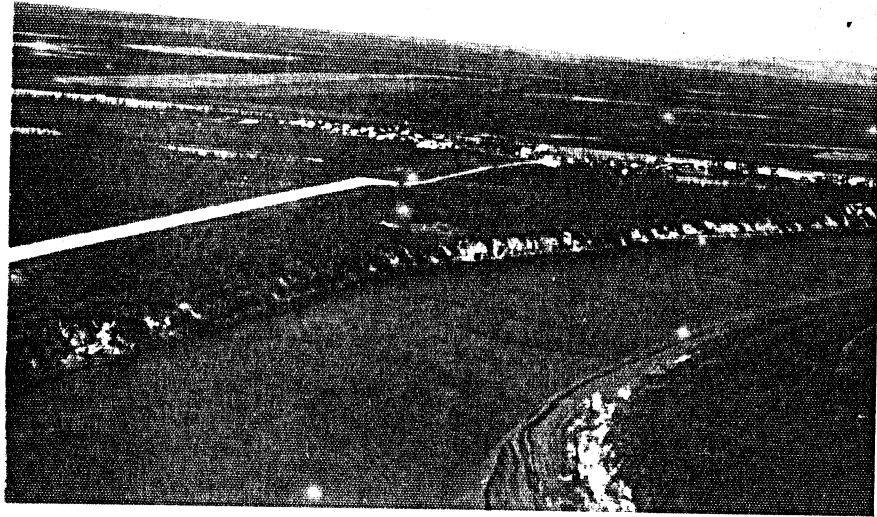
Overburden ranges from 1.5 to 3.75 feet and consists of organics over silt. A trace of frost was found in the material below an average depth of one foot. The proven deposit contains 100,000 cubic yards of material. Utilization of this site during the summer would require installation of a haul road.

CONCLUSIONS AND RECOMMENDATIONS

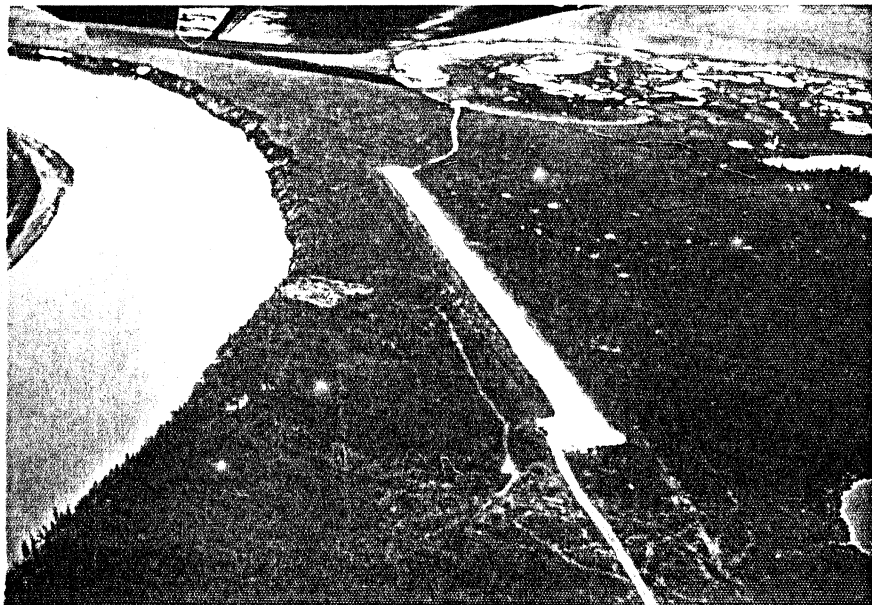
1. Clear the proposed alignment of trees and shrubs.
2. The embankment should consist of an overlay constructed from the sandy silt available in the lake bed.
3. Top the embankment with gravel.
4. Utilize a winter haul from the borrow site and avoid construction of a haul road.

PHOTOGRAPHS

NOORVIK

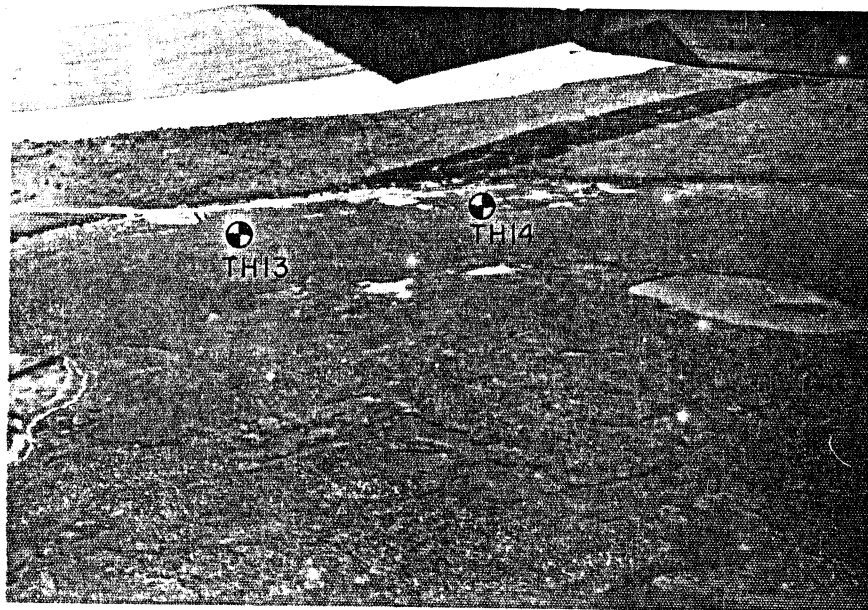


Noorvik airfield and village

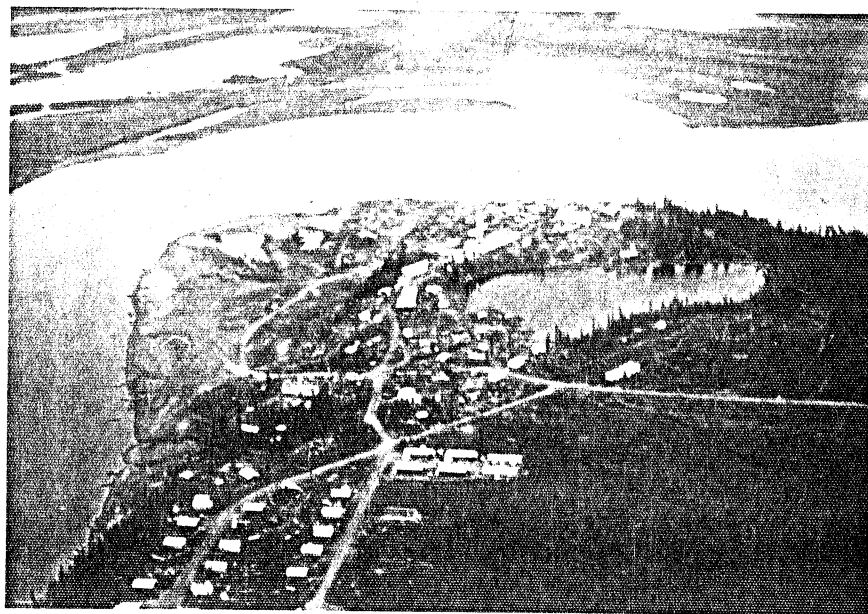


Noorvik airfield. Embankment material for construction of the cross-wind alignment can be obtained from the semi-drained lakebed in the background.

NOORVIK



Semi-drained lakebed south of the airfield



Embankment material for construction of the original runway came from the bar left of the village

NOORVIK AIRPORT

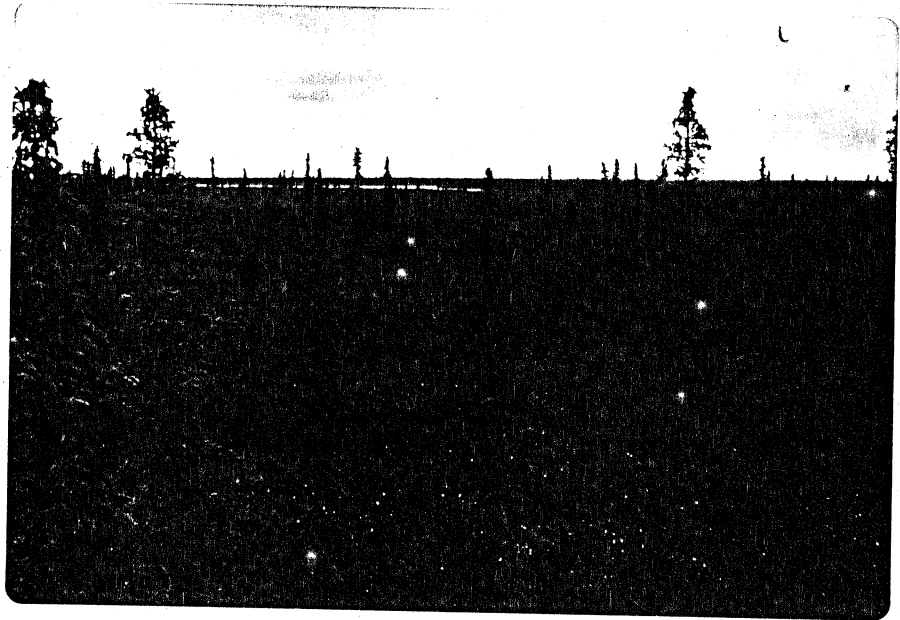


Looking east toward Noorvik 7/23/73 D.P.

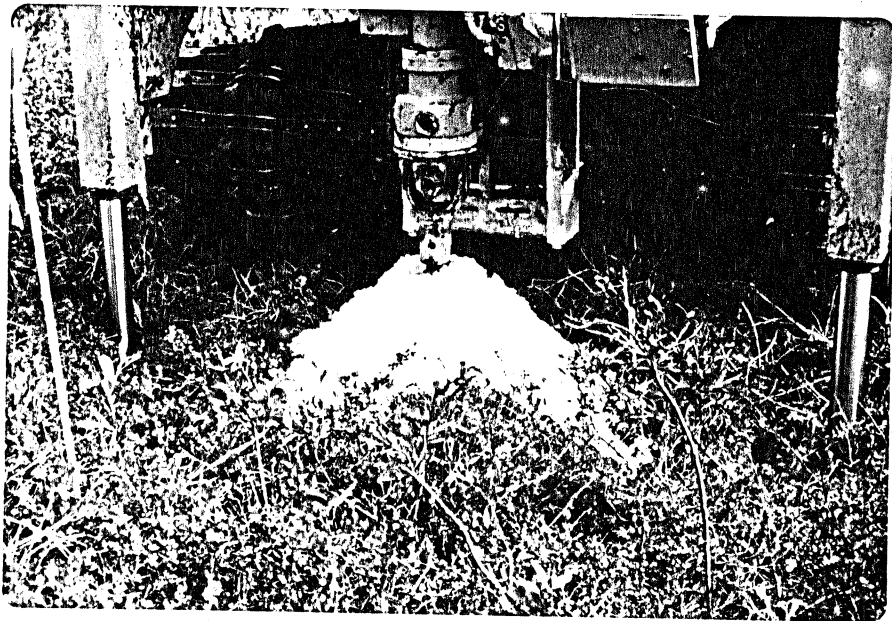


Drilling test hole 19 - view looking northeast along proposed alignment 7/23/73 D.P.

NOORVIK AIRPORT

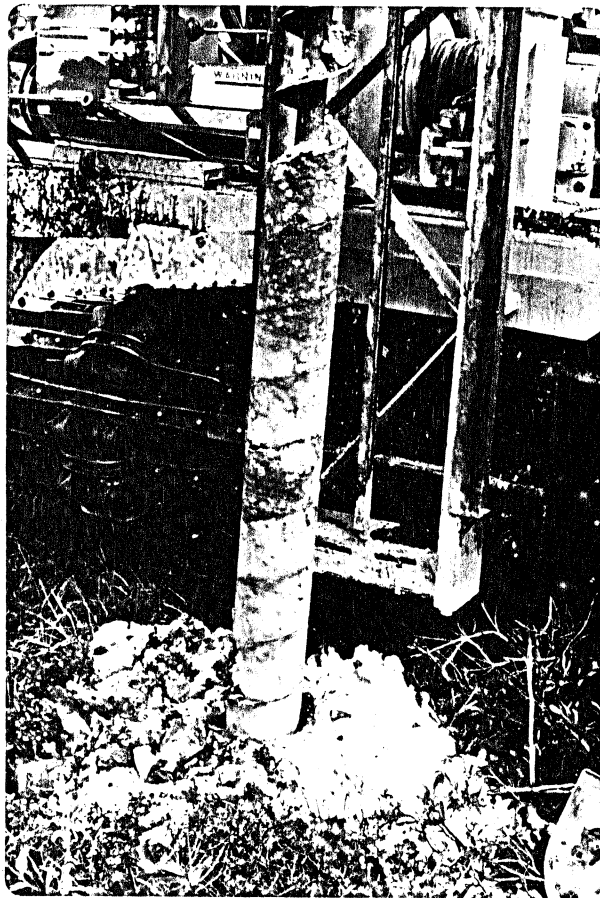


View looking southwest along proposed alignment from test hole 19. 7/23/73 D.P.



Test hole 1 - Ice below 4.5' 7/22/73 D.P.

NOORVIK AIRPORT

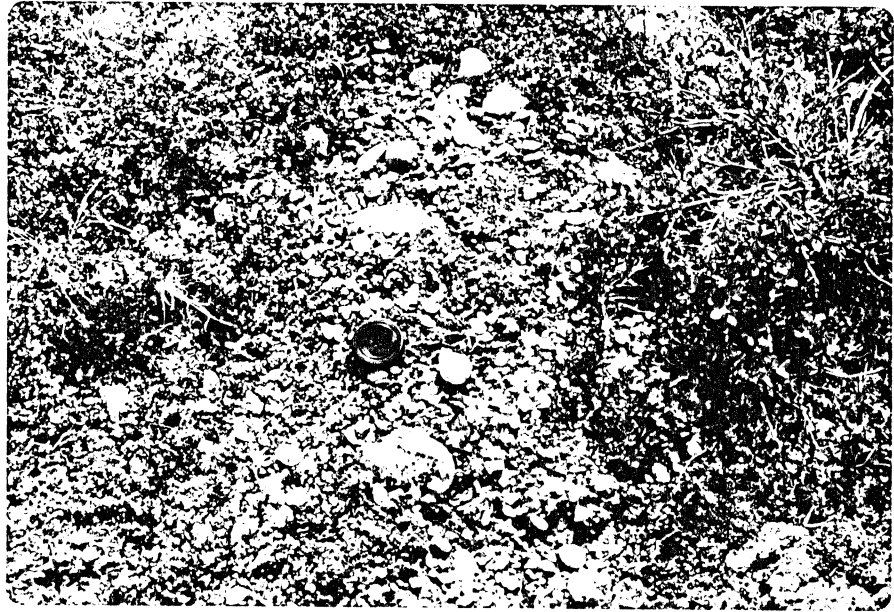


Test hole 5 - Ice below 4.5' 7/22/73 D.P.

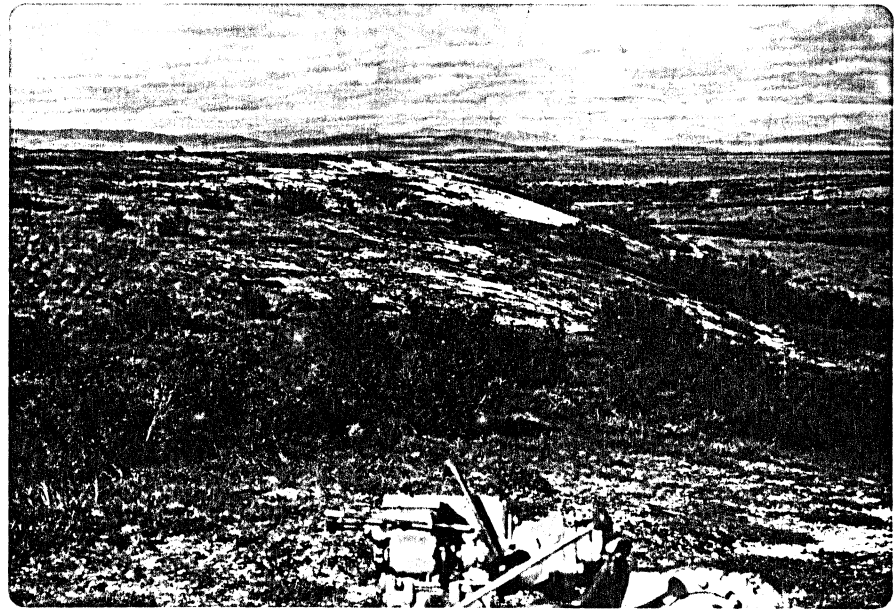


Noorvik Borrow Exploration - Drilling test hole 2. Borrow material consists of gravelly silty sand grading to gravelly sand in depth. Frost is present below 4.0. The material is an ancient beach deposit. 7/22/73 DP

NOORVIK AIRPORT

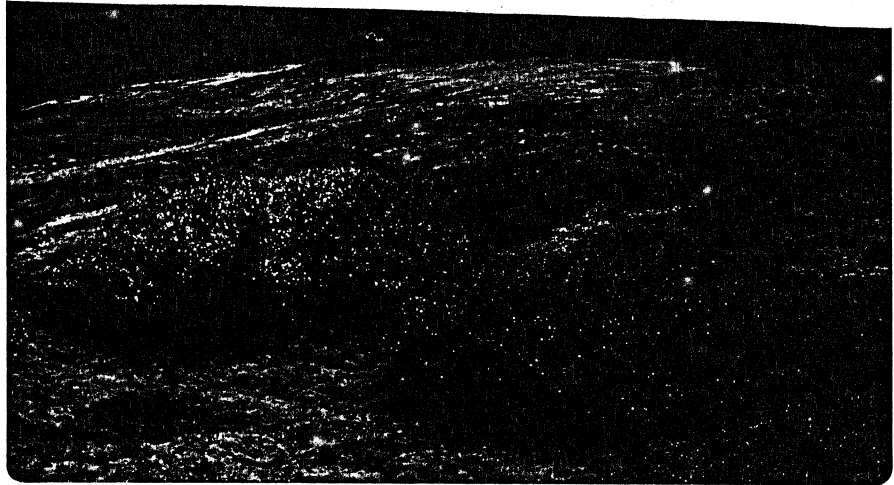


Noorvik Borrow Exploration - Surface material as found in the vicinity of test hole #2. 7/22/73 D.P.



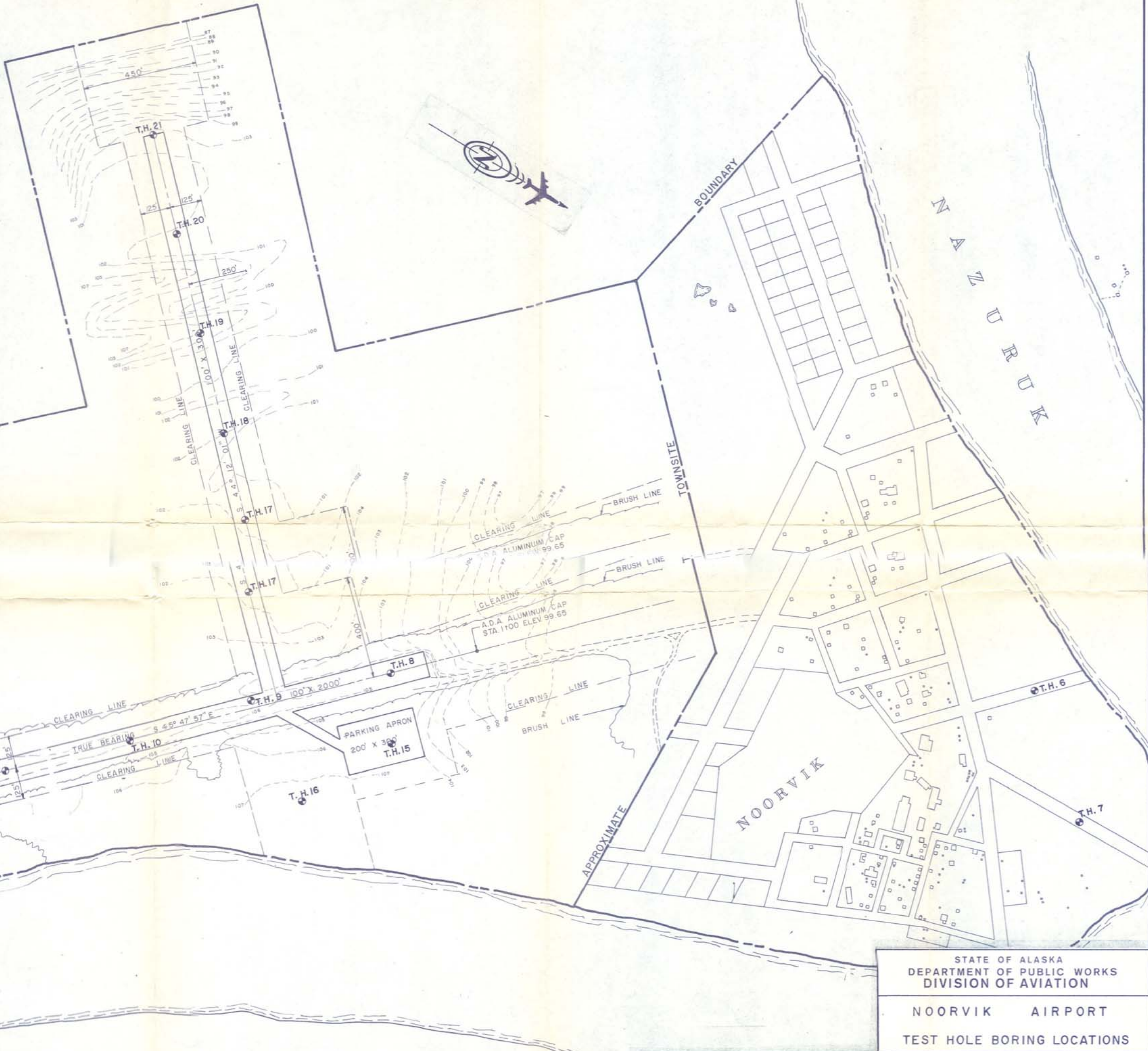
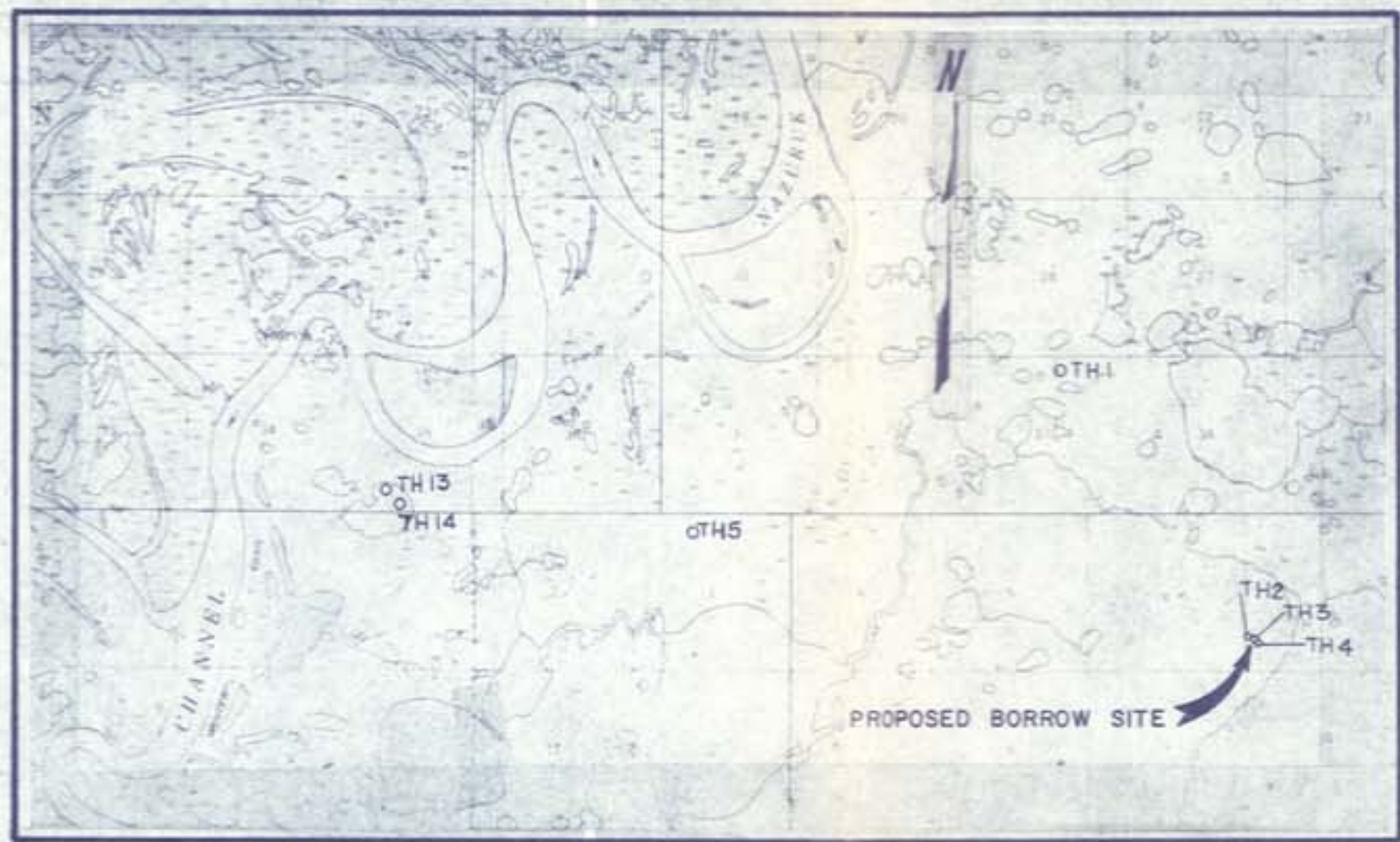
Noorvik Borrow Exploration - View looking Northeast. 7/22/73 D.P.

NOORVIK AIRPORT



Noorvik Borrow Exploration - the light colored material in the center of the photo is the exposed remains of an ancient beach deposit. 7/22/73 D.P.

TEST HOLE BORING LOCATIONS

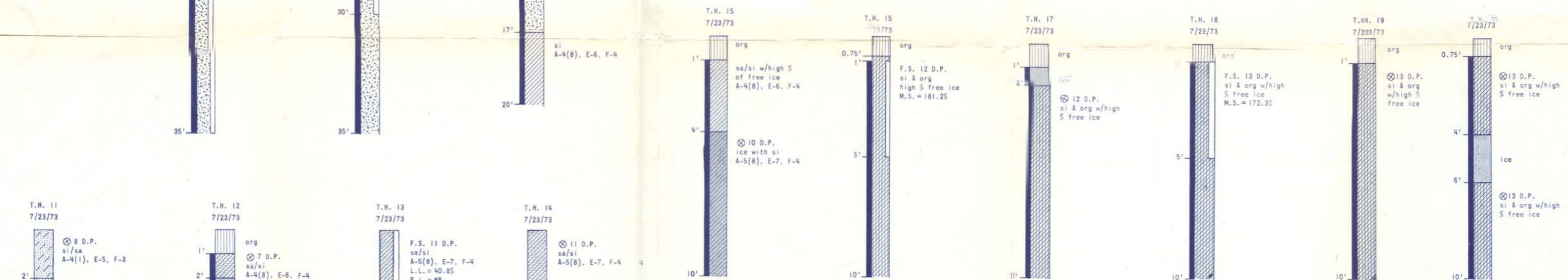
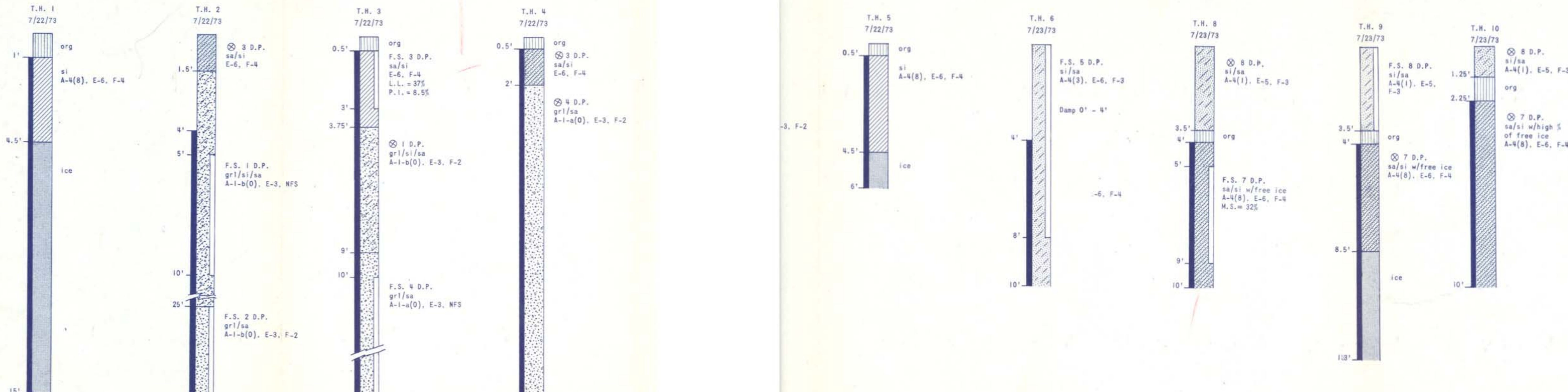


STATE OF ALASKA
 DEPARTMENT OF PUBLIC WORKS
 DIVISION OF AVIATION

NOORVIK AIRPORT
TEST HOLE BORING LOCATIONS

| | | | |
|----------|------|---|-----------|
| APPROVED | | CLAYTON C. HUENERS, P.E. CHIEF DESIGN ENGINEER | |
| APPROVED | | WILLIAM KOESTER, P.E. SECONDARY AIRPORTS ENGINEER | |
| BY | DATE | CHANGE | SCALE |
| | | | 1" = 200' |
| | | REVISIONS | CHECKED |
| | | | DATE |
| | | | SHEET OF |

SOIL BORING LOGS



BORING LOG LEGEND

7/22/73 Date of Soil Boring

- Frozen Material
- F.S. 3 Field Sample
- Strata Change
- 3 Similar to Field Sample 3
- Depth in Feet
- Water Table

- org (Organics)
- si (Silt)
- ice (Ice)
- sa/si (Sandy Silt)
- grl/si/sa (Gravelly Silty Sand)
- grl/sa (Gravelly Sand)
- si/sa (Silty Sand)

STATE OF ALASKA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF AVIATION

**NOORVIK MATERIALS INVESTIGATION
SOIL BORING LOGS**

APPROVED: CLAYTON C. HUENERS, P.E. CHIEF DESIGN ENGINEER

APPROVED: WILLIAM KOESTER, P.E. SECONDARY AIRPORTS ENGINEER

SCALE: 1" = 2'

BY: DATE: CHANGE: REVISIONS

CHECKED: D.P. DATE: 12/20/73 SHEET OF

LAB REPORTS

DH-215
(2-69)

SOILS TESTING REPORT

PROJECT NAME Noorvik R/W & Borrow Invest. PROJECT NO. 13.83.6.261-298-233 SAMPLED BY Pavey
 MATERIAL SITE Runway

| | | | | | | | |
|------------------------|----------|----------|----------|----------|----------|----------|------|
| STATION | | | | | | | |
| OFFSET (FEET) | | | | | | | |
| DEPTH (FEET) | 5.0-10.0 | 5.0-8.0 | 0.0-6.0 | 1.0-5.0 | 1.0-5.0 | | |
| TEST HOLE NO. | 11 | 12 | 13 | 16 | 18 | 21 | |
| FIELD NO. | FS9DP | FS10DP | FS11DP | FS12DP | FS13DP | FS14DP | |
| LAB. NO. | DA73-557 | DA73-558 | DA73-559 | DA73-560 | Da73-561 | DA73-562 | |
| ESTIMATED % +10" | | | | | | | |
| ESTIMATED % + 3" | | | | | | | |
| PERCENT PASSING | 3" | | | | | | |
| | 2" | | | | | | |
| | 1" | | | | | | |
| | 3/4" | | | | | | |
| | 1/2" | | | | | | |
| | 3/8" | | | | | | |
| | 4 | | | | | | |
| | 10 | | 100 | 100 | | | 100 |
| | 40 | | 99.5 | 99.6 | | | 98 |
| | 200 | | 96.4 | 91.5 | | | 88.5 |
| .02mm | | 51.0 | 42.0 | | | 34.0 | |
| .005mm | | | | | | | |
| LIQUID LIMIT | | 43.0 | 40.8 | | | 34.5 | |
| PLASTIC INDEX | | NP | NP | | | NP | |
| AASHO CLASS | | A-5 (8) | A-5 (8) | | | A-4 (8) | |
| F. S. V. | | | | | | | |
| Sp. G., FINE | | | | | | | |
| NAT. MOISTURE | 134.0 | 114.0 | | 181.2 | 172.3 | 36.1 | |
| UNIFIED CLASS | | Si | Sa Si | Organic | Organic | Sa Si | |
| FAA CLASS | | E-7 | E-7 | | | E-6 | |
| FROST CLASS | | F4 | F4 | | | F4 | |
| DATE SAMPLED | 7/23/73 | 7/23/73 | 7/23/73 | 7/23/73 | 7/23/73 | 7/23/73 | |
| | | | | | | | |
| | | | | | | | |