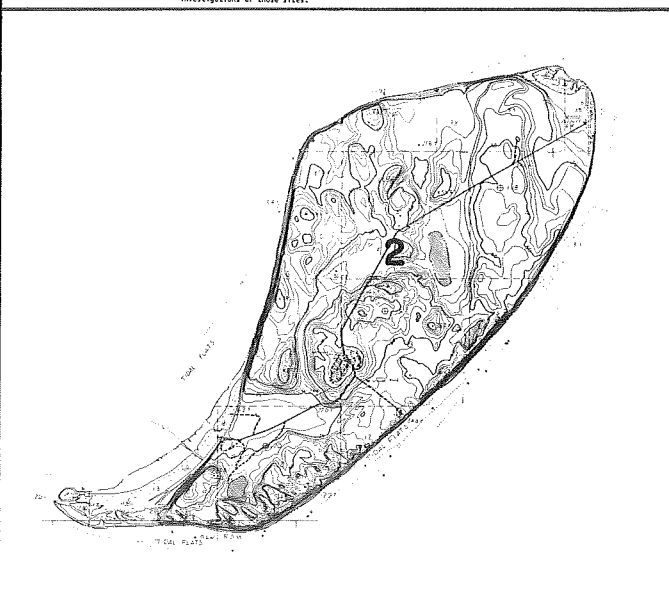


NOTES

a) **Base map origin:** Municipality of Anchorage Planning Department.

b) **Limitations:** Interpretive map for general planning based upon Municipality-wide geological and other data which is of varying accuracy and completeness as explained in the accompanying report titled "Geotechnical Hazards Assessment Study, Municipality of Anchorage prepared by Harding-Lasson Associates, Anchorage, Alaska. Geotechnical Hazard Assessment and Subsidence Conditions relative to construction at specific sites should be determined by qualified engineers and geologists through appropriate investigations of those sites."

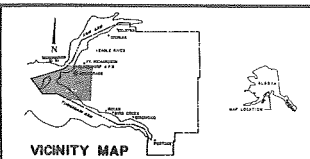


**MUNICIPALITY OF ANCHORAGE
GEOTECHNICAL HAZARDS ASSESSMENT
TECTONIC HAZARDS AND MAXIMUM EXPECTABLE
EARTHQUAKE INTENSITIES - ANCHORAGE**

PLATE **1A**

Compiled by T.L.D.
Checked by [Signature]

MARCH, 1979
Rev. 6/79



LEGEND

EARTHQUAKE INTENSITY ZONES

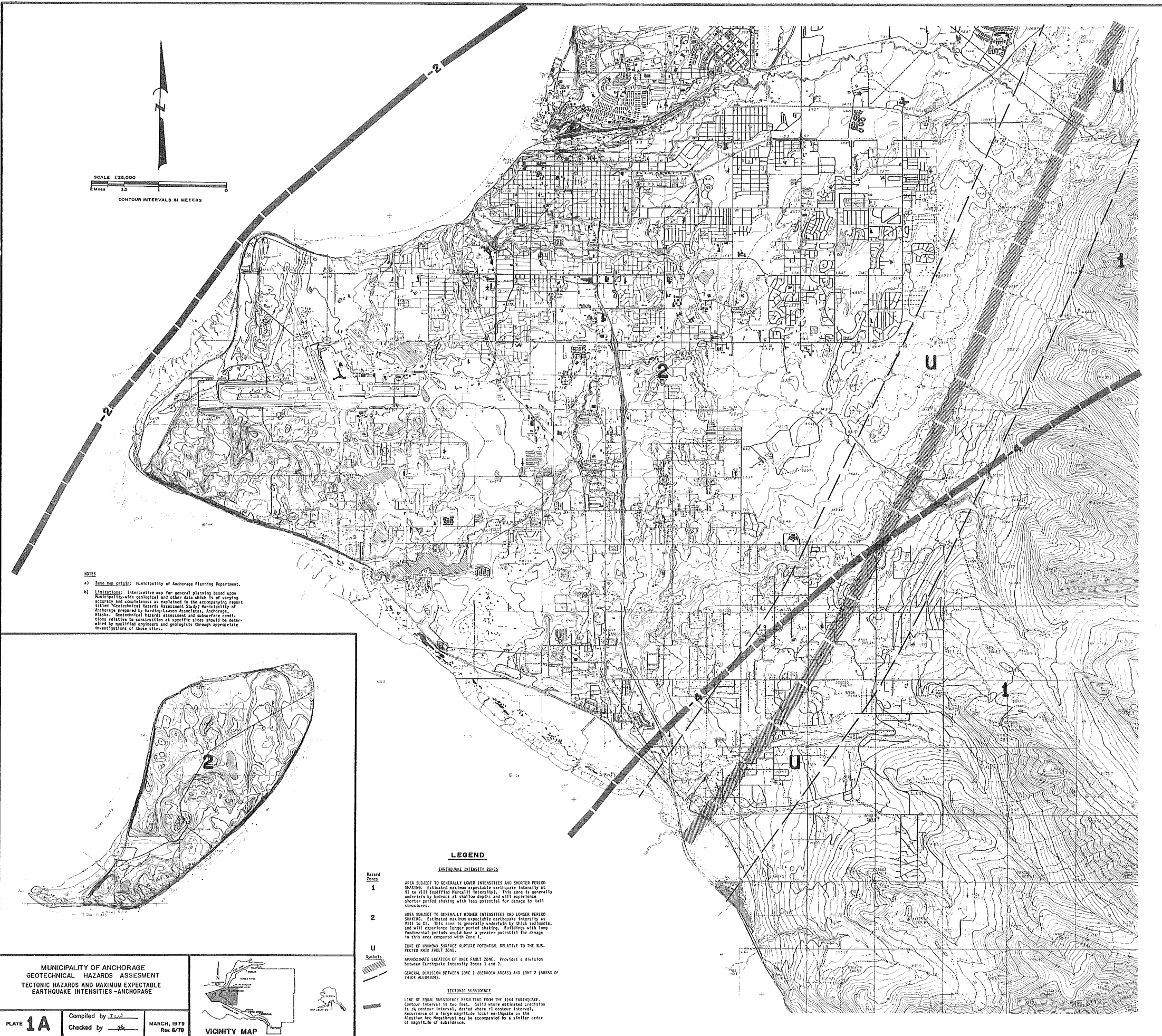
Hazard Zone 1
AREA SUBJECT TO GENERALLY LOWER INTENSITIES AND SHORTER PERIOD SHAKING. Estimated maximum expected earthquake intensity at VIII to VIII (modified Mercalli intensity). This zone is generally underlain by bedrock at shallow depths and will experience shorter period shaking with less potential for damage to tall structures.

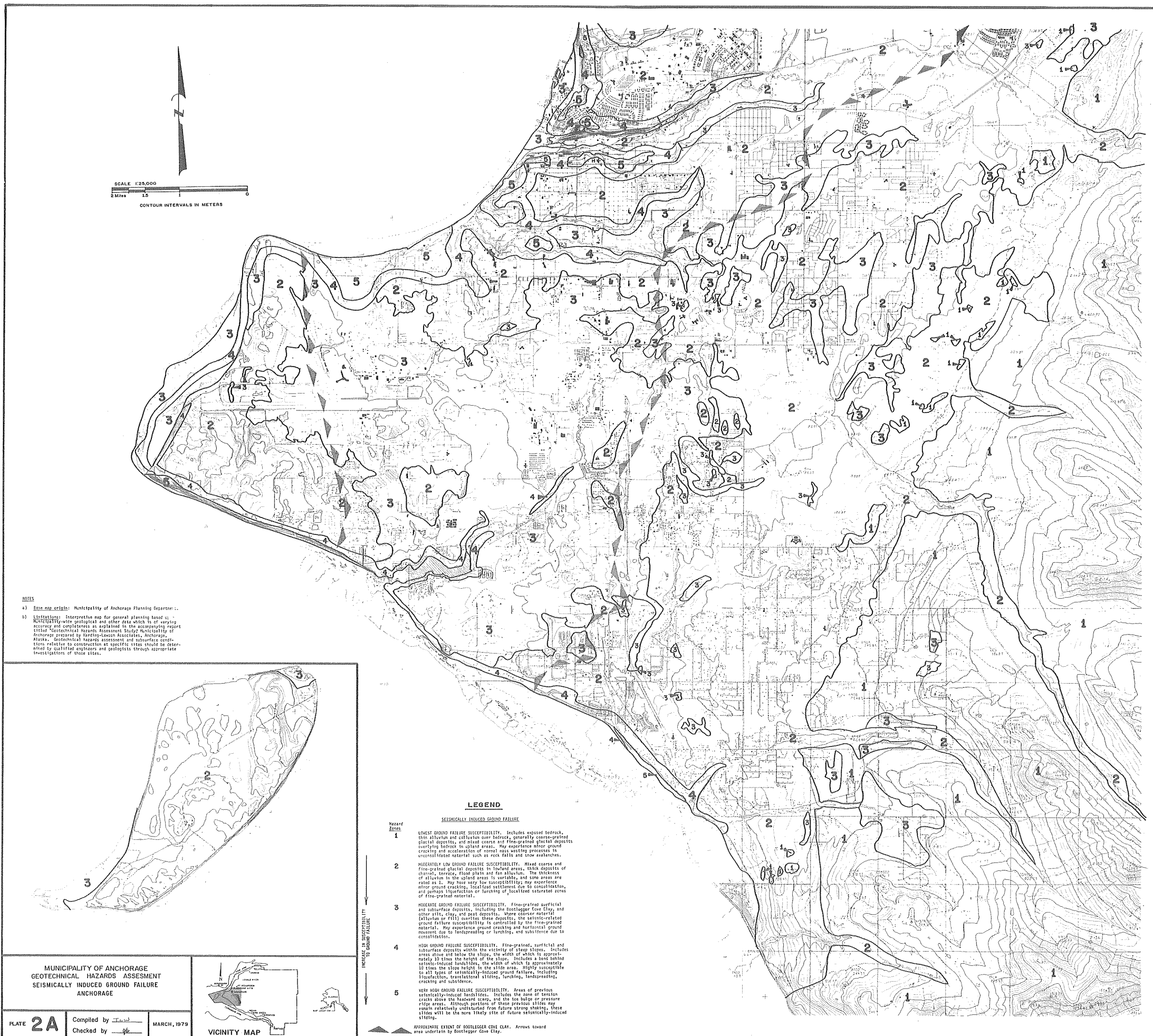
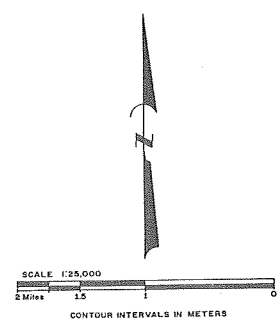
2
AREA SUBJECT TO GENERALLY HIGHER INTENSITIES AND LONGER PERIOD SHAKING. Estimated maximum expected earthquake intensity at VIII to IX. This zone is generally underlain by thick sediments and will experience longer period shaking. Buildings with long fundamental periods would have a greater potential for damage to this area compared with Zone 1.

U
ZONE OF UNUSUAL SURFACE RUPTURE POTENTIAL RELATIVE TO THE SUSPECTED WALK FAULT ZONE.

Symbols
APPROXIMATE LOCATION OF WALK FAULT ZONE. Provides a division between Earthquake Intensity Zones 1 and 2.
GENERAL DIVISION BETWEEN ZONE 1 (BEDROCK AREAS) AND ZONE 2 (AREAS OF THICK ALLUVIUM).

TECTONIC SUBSIDENCE
LINE OF EQUAL SUBSIDENCE RESULTING FROM THE 1864 EARTHQUAKE. Contour interval is two feet. Solid where estimated precision is 1/4 contour interval, dashed where 1/2 contour interval. Occurrence of a large magnitude local earthquake on the Alaskan Arc might be accompanied by a similar order of magnitude of subsidence.





NOTES

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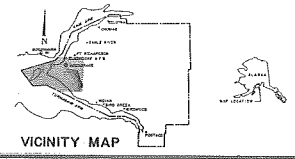


LEGEND

- SEISMICALLY INDUCED GROUND FAILURE**
- Hazard Zones**
- 1** LOWEST GROUND FAILURE SUSCEPTIBILITY. Includes exposed bedrock, thin alluvium and colluvium over bedrock, generally coarse-grained glacial deposits, and mixed coarse and fine-grained glacial deposits overlying bedrock in upland areas. May experience minor ground cracking and acceleration of normal mass wasting processes. In unconsolidated material such as rock falls and snow avalanches.
 - 2** MODERATELY LOW GROUND FAILURE SUSCEPTIBILITY. Mixed coarse and fine-grained glacial deposits in lowland areas. Thick deposits of channel, terrace, flood plain and fan alluvium. The thickness of alluvium in the upland areas is variable, and some areas are rated as 1. May have very low susceptibility; may experience minor ground cracking, localized settlements due to consolidation, and perhaps liquefaction or bursting of localized saturated zones of fine-grained material.
 - 3** MODERATE GROUND FAILURE SUSCEPTIBILITY. Fine-grained surficial and subsurface deposits, including the Bootlegger Cove Clay, and other silty, clay, and peat deposits. Where clayey material (alluvium or fill) overlies these deposits, the seismic-related ground failure susceptibility is controlled by the fine-grained material. May experience ground cracking and horizontal ground movement due to landsliding or bursting, and subsidence due to consolidation.
 - 4** HIGH GROUND FAILURE SUSCEPTIBILITY. Fine-grained, surficial and subsurface deposits within the vicinity of steep slopes. Includes areas above and below the slope, the width of which is approximately 10 times the height of the slope area. Includes a band behind seismic-induced landslides, the width of which is approximately 10 times the slope height in the slope area. Highly susceptible to all types of seismically-induced ground failure, including liquefaction, translational sliding, bursting, landsliding, cracking and subsidence.
 - 5** VERY HIGH GROUND FAILURE SUSCEPTIBILITY. Areas of previous seismically-induced landslides. Includes the zone of tension cracks above the headward scarp, and the toe bulge or pressure ridge areas. Although portions of these previous slides may remain relatively undisturbed from future strong shaking, these slides will be the more likely site of future seismically-induced slides.
- APPROXIMATE EXTENT OF BOOTLEGGERS COVE CLAY. Arrows toward area underlain by Bootlegger Cove Clay.

MUNICIPALITY OF ANCHORAGE
 GEOTECHNICAL HAZARD ASSESSMENT
 SEISMICALLY INDUCED GROUND FAILURE
 ANCHORAGE

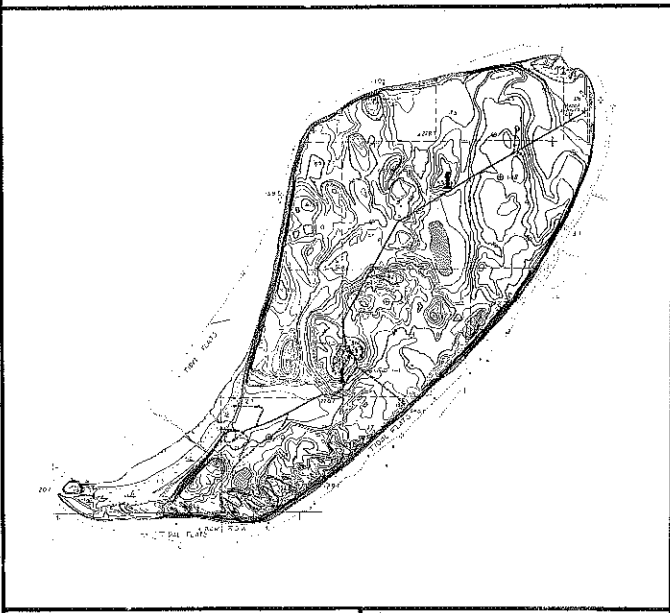
PLATE **2A** Compiled by T.L.W. MARCH, 1979
 Checked by J.K.



SCALE 1:25,000
 0 1.5 3
 METERS
 CONTOUR INTERVALS IN METERS

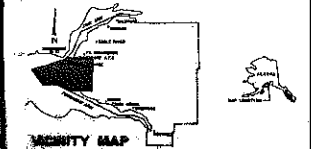


NOTES
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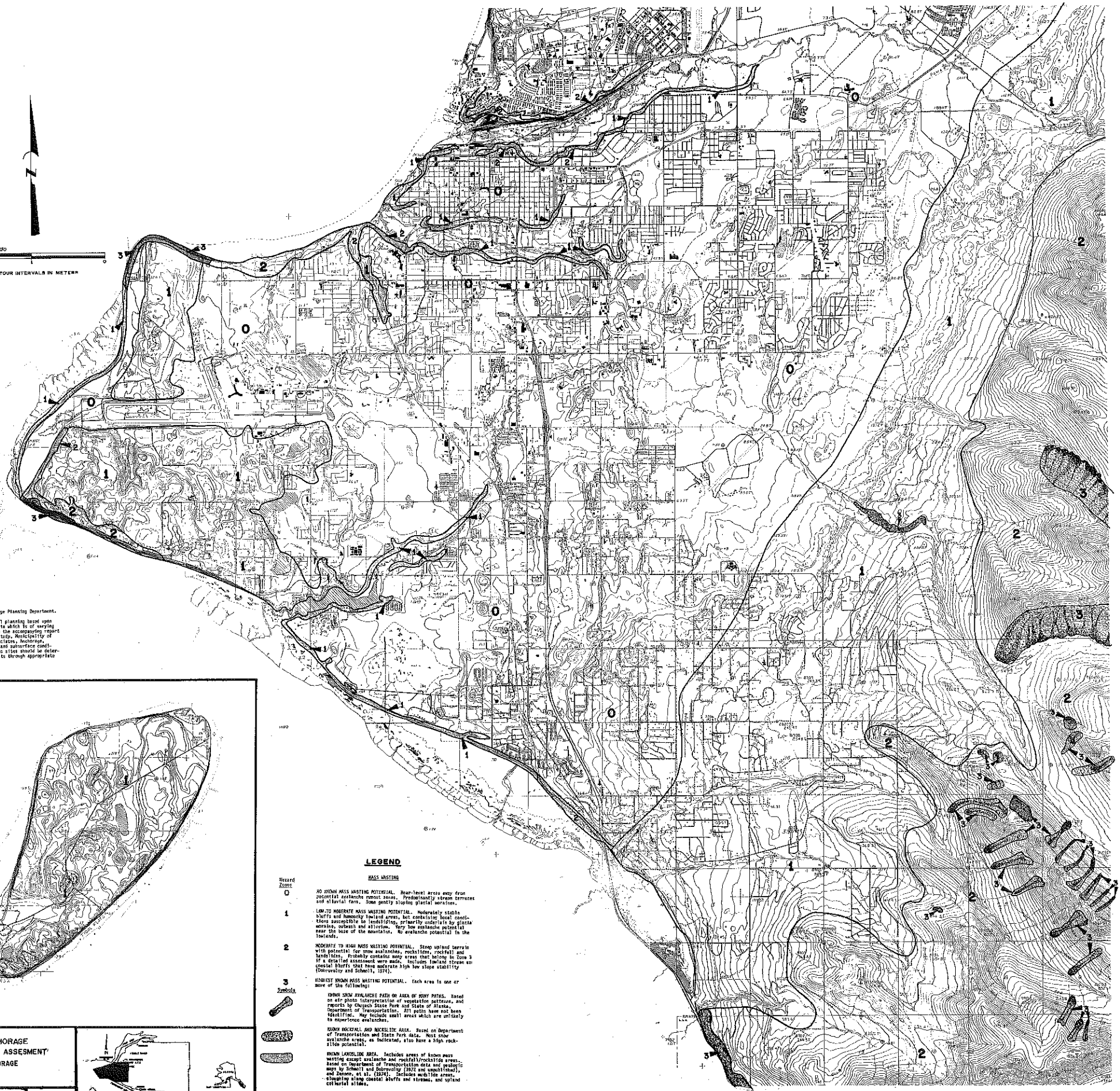
MUNICIPALITY OF ANCHORAGE
 GEOTECHNICAL HAZARD ASSESSMENT
 MASS WASTING - ANCHORAGE

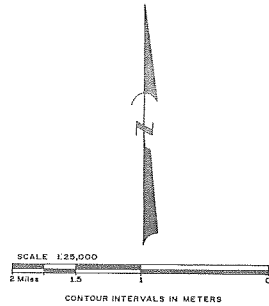
PLATE 3A
 Compiled by [Signature]
 Checked by [Signature]
 MARCH, 1979
 No. 879



LEGEND

- MASS WASTING**
- Hazard Zone**
- 0 NO KNOWN MASS WASTING POTENTIAL. Near-level areas away from potential avalanche runoff zones. Predominantly steep terraces and alluvial fans. Some gently sloping glacial moraine.
 - 1 LOW TO MODERATE MASS WASTING POTENTIAL. Moderately stable hillsides and normally level areas, but containing local conditions susceptible to landsliding, primarily underlain by glacial moraine, colluvial and alluvium. Very low avalanche potential near the base of the mountains. No avalanche potential in the foothills.
 - 2 MODERATE TO HIGH MASS WASTING POTENTIAL. Steep upland terrain with potential for some avalanches, rockslides, raveling and landslides. Primarily contains many areas that belong to Zone 1. If a detailed assessment were made, includes limited steep upland bluffs that have moderate high low slope stability (University and Schell, 1971).
 - 3 HIGHEST KNOWN MASS WASTING POTENTIAL. Each area is one or more of the following:
 - KNOWN SLIP AVULACHIE PATHS OR AREA OF HIGH PAGES. Based on air photo interpretation of vegetation patterns, and reports by Church State Park and State of Alaska, Department of Transportation. All paths have not been identified. May include small areas which are unlikely to experience avalanches.
 - KNOWN ROCKFALL AND ROCKFALL AREAS. Based on Department of Transportation and State Park data. Most show avalanche areas as indicated, also have a high rock-fall potential.
 - KNOWN LANDSLIDE AREA. Includes areas of known mass wasting except avalanche and rockfall-prone areas. Based on Department of Transportation data and geologic maps by Schell and Boland (1971) and Schell, and Zenger, et al. (1974). Includes multiple areas, steeply along coastal bluffs and streams, and upland colliuvial alluvium.

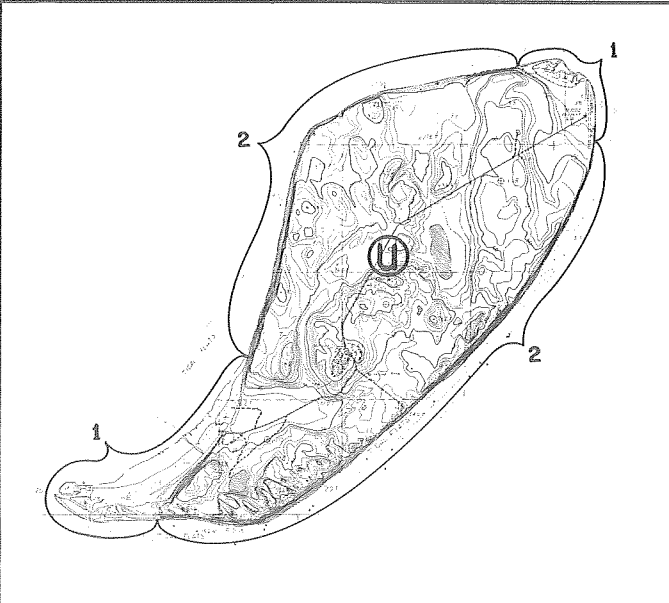




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MUNICIPALITY OF ANCHORAGE
 GEOTECHNICAL HAZARDS ASSESSMENT
 COASTAL EROSION, FLOODING AND WIND
 ANCHORAGE

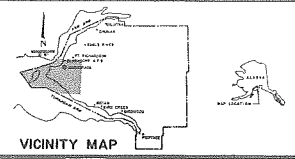


PLATE 4A
 Compiled by [signature]
 Checked by [signature]
 MARCH, 1979

LEGEND

COASTAL EROSION

Hazard Zones

1 AREA OF SLOW TO MODERATE COASTAL EROSION. Bluffs and coastal slopes in alluvial material which are not subject to tidal and wave action under present shoreline conditions. Bedrock shoreline (along Soropalee Arm). Areas protected by structures or other man-made stabilizing features (Anchorage dock, railroad embankments).

2 AREA OF SLOW TO MODERATE COASTAL EROSION. Bluffs and beaches which are subject to occasional tidal and wave action.

3 AREA OF RAPID COASTAL EROSION. Bluffs at Pt. Woronof directly exposed to frequent tidal and wave action. Rate of horizontal retreat up to 2.5 ft./year.

COASTAL FLOODING

EXPECTED HIGH WATER FROM 100-YEAR TIDE FLOOD. Maximum expected tsunami runup is below this line.

WIND

WEATHER STATION WITH ANEMOMETER.

NORTH WINDS. Caused by cold air masses displacing the prevailing southerly air flow. Affects waterfront areas.

STRONG FUNNELED "CHUGACH" WINDS. Show path and direction. Beached shore data are backing. In general, the speed and occurrence of high velocity winds increases upslope along the Chugach Mountain front.

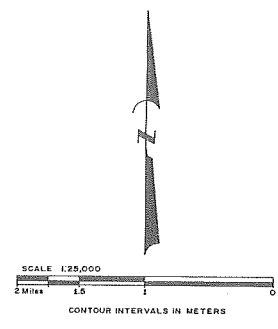
Hazard Zones

1 MODERATE WIND AREA. Lowland areas subject to occasional 50 mph winds and rare 70 mph winds. A 100 mph wind should be expected during a 50-year period.

2 HIGH WIND AREA. Areas subject to one or two 50 mph winds per year with occasional gusts to 100 mph. Steep valleys along the mountain front have higher velocity funneled winds. Lowland areas subject to funneled high velocity south and southeasterly winds.

3 Lowland areas subject to high velocity north winds.

UNKNOWN WIND CONDITIONS. No wind records. Includes upland areas and the Eagle River lowland areas. Gusty up to 100 mph should be expected in the lowlands, and some high areas in the Chugach Mountains probably get funneled winds exceeding 100 mph.



NOTES

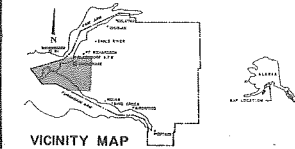
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MUNICIPALITY OF ANCHORAGE
 GEOTECHNICAL HAZARDS ASSESSMENT
 GROUND WATER, ICINGS AND PERMAFROST
 ANCHORAGE

PLATE **5A** Compiled by Ted MARCH, 1979
 Checked by W



LEGEND

GROUNDWATER AND WETLANDS

Symbols

APPROXIMATE 20-FOOT GROUNDWATER DEPTH CONTOUR. Measured on site where unconfined water level is greater than 20 feet below the ground surface. Dashed where uncertain (see Figure 5 for areas of ground studies).

KNOWN AREA OF SATURATED SURFICIAL DEPOSITS.

Hazard Zones

1 LOWEST POTENTIAL FOR SURFACE DRAINAGE PROBLEMS. Includes upland areas, and lowland hills where the unconfined water level is believed to be greater than 20 feet below the ground surface. Some springs and swampy areas may be encountered, but in general, there are few areas with near-surface groundwater.

2 MODERATE POTENTIAL FOR SURFACE DRAINAGE PROBLEMS. Includes lowland areas where the unconfined water level is within 20 feet of, but generally does not saturate the surface.

3 HIGH POTENTIAL FOR SURFACE DRAINAGE PROBLEMS. Known areas of saturated surficial materials (wetlands, swamps and meadows). Areas which are higher than a nearby stream are easier to drain than enclosed depressions.

FROZEN GROUND

2 MODERATE POTENTIAL FOR PERMAFROST CONDITIONS. Permafrost may occur in small isolated zones throughout this area. No area should be considered free from permafrost without subsurface exploration.

3 HIGH POTENTIAL FOR ISOLATED PERMAFROST CONDITIONS. Outlined by the Municipality of Anchorage Geotechnical Commission (unpublished).

U UNASSESSED POTENTIAL FOR PERMAFROST CONDITIONS. The entire Eagle River and Turnagain Arm sheets are included in this category. Permafrost is possible at any location in these areas.

ICINGS

EXISTING ADVISING PROBLEM AREA. Hanging icings encroach on roadway and railway in these areas. Icings could be encountered in other geologically similar areas.

