

# BUKU KETERANGAN PETA SATUAN LAHAN DAN TANAH LEMBAR SIDIKALANG, SUMATERA

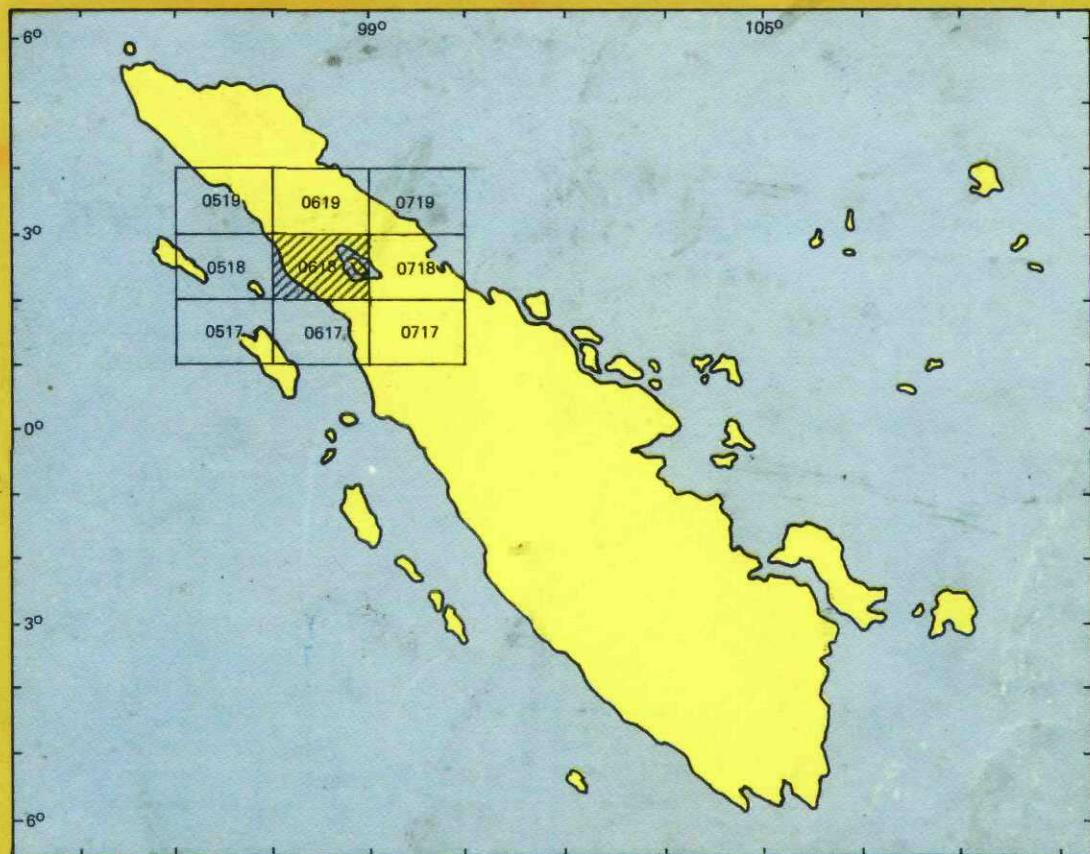
EXPLANATORY BOOKLET OF THE LAND UNIT AND SOIL MAP  
OF THE SIDIKALANG SHEET, SUMATRA

Oleh/By :

H. Darul SWP, Junus Dai, A. Hidayat, Yayat AH, H.Y. Sumulyadi, Hendra S.,  
P. Buurman, T. Balsem

SEKALA/SCALE 1 : 250.000

LEMBAR/SHEET : 0618



PROYEK PERENCANAAN DAN EVALUASI SUMBER DAYA LAHAN  
PENGELOLAAN DATA BASE TANAH  
PUSAT PENELITIAN TANAH  
BADAN PENELITIAN DAN PENGEMBANGAN PERTANIAN  
LAND RESOURCE EVALUATION AND PLANNING PROJECT  
SOIL DATA BASE MANAGEMENT  
CENTER FOR SOIL RESEARCH  
AGENCY FOR AGRICULTURAL RESEARCH AND DEVELOPMENT  
1989

Penanggung jawab  
*Head of the Project*

**DR. M. SUDJADI**

Kepala Pusat Penelitian Tanah  
Badan Penelitian dan Pengembangan Pertanian  
Departemen Pertanian

*The Director of the Center for Soil Research  
Agency for Agricultural Research and Development  
Department of Agriculture*

Urusan mengenai publikasi ini harus dialamatkan kepada:

**Kepala Pusat Penelitian Tanah**  
Jalan H. Juanda 98, Tilpon 23012  
Bogor 16123, Indonesia

*Correspondence concerning this publication should be addressed to:*

*The Director of the Center for Soil Research*  
*Jalan H. Juanda 98, Phone 23012*  
*Bogor 16123, Indonesia*

**BUKU KETERANGAN  
PETA SATUAN LAHAN dan TANAH LEMBAR SIDIKALANG (0618), SUMATERA**

Explanatory booklet of the  
LAND UNIT and SOIL map of the SIDIKALANG Sheet (0618), Sumatra

Sekala/Scale 1 : 250.000

Oleh/By:

H.Darul SWP, Junus Dai, A.Hidayat, Yayat A.H., H.Y.Sumulyadi,  
Hendra S., P.Buurman dan/and T.Balsem.

Buku Keterangan Peta Satuan Lahan dan Tanah ini dihasilkan oleh Tim Pengelolaan Data Base Tanah dari Proyek Perencanaan dan Evaluasi Sumber Daya Lahan, program kerja sama teknis antara Pemerintah Republik Indonesia dan Bank Pembangunan Asia, dilaksanakan oleh Pusat Penelitian Tanah (Badan Penelitian dan Pengembangan Pertanian, Departemen Pertanian) dan dikoordinasikan oleh Badan Koordinasi Survei dan Pemetaan Nasional (BAKOSURTANAL). Survei dan pemetaan dilaksanakan oleh Pusat Penelitian Tanah bekerjasama dengan konsultan dari HASKONING Royal Dutch Consulting Engineers and Architects.

*This Explanatory Booklet and the accompanying Land Unit and Soil map have been produced by the Soil Data Base Management Team of the Land Resource Evaluation and Planning Project (LREP, part II), a technical cooperation programme between the Government of the Republic of Indonesia and the Asian Development Bank, executed by the Center for Soil Research (part of the Agency for Agricultural Research and Development of the Department of Agriculture) and supervised by the National Coordination Agency for Surveys and Mapping (BAKOSURTANAL). The survey and mapping were carried out by the Center for Soil Research, in cooperation with the consultants of HASKONING Royal Dutch Consulting Engineers and Architects.*

**PUSAT PENELITIAN TANAH  
BADAN PENELITIAN DAN PENGEMBANGAN PERTANIAN  
DEPARTEMEN PERTANIAN**

*CENTER for SOIL RESEARCH  
AGENCY for AGRICULTURAL RESEARCH and DEVELOPMENT  
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*First edition, 1989.*

Cara merujuk buku ini:

*H.Darul SWP, Junus Dai, A.Hidayat, Yayat A.H., H.Y.Sumulyadi, Hendra S., P.Buurman dan T.Balsem, 1989. Buku Keterangan Peta Satuan Lahan dan Tanah lembar Sidikalang (0618), Sumatera. Pusat Penelitian Tanah. Bogor.*

*How to cite this book:*

*H.Darul SWP, Junus Dai, A.Hidayat, Yayat A.H., H.Y.Sumulyadi, Hendra S., P.Buurman and T.Balsem, 1989. Explanatory booklet of the Land Unit and Soil map of the Sidikalang Sheet (0618), Sumatra. Center for Soil Research, Bogor.*

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## PENUNTUN UNTUK PEMAKAI

Buku keterangan ini adalah penjelasan dari Peta Satuan Lahan dan Tanah lembar Sidikalang (0618), Sumatera, skala 1:250.000.

Legenda peta berisikan satuan lahan yang merupakan satuan geomorfik dan dibatasi dengan cara menginterpretasi foto udara, citra satelit dan citra Radar. Isi dari tiap satuan lahan diperiksa di lapangan dan kemudian dicatat. Hanya sebahagian dari semua informasi ini disajikan dalam peta, sedangkan sebahagian lagi diberikan secara ringkas dalam Buku Keterangan ini; informasi yang lebih lengkap dapat tersedia jika diminta.

Simbol peta menunjukkan grup fisiografi (huruf besar), tipe batuan (huruf kecil), dan pembagian lebih lanjut berdasarkan atas lereng dan tingkat torehan (pada daerah berlereng dan angkatan) atau berdasarkan lingkungan pengendapan/hidrologinya (pada daerah aluvial resen dan marin), yang ditunjukan oleh angka. Huruf kecil yang berada dimuka kode grup fisiografi menunjukkan adanya tutupan dari bahan lain, seperti tutupan abu vulkan pada perbukitan dari batuan sedimen atau lapisan bahan organik tipis pada dataran aluvial.

Grup fisiografi tersebut adalah : Kubah Gambut, Aluvial, Marin, Teras Marin, Dataran Tuf Masam, Dataran, Tuf Masam Toba, Volkan, Karst, Perbukitan, Pegunungan/Plato dan Aneka Bentuk. Grup Dataran Tuf Masam, Tuf Masam Toba, Volkan, Kubah Gambut dan Karst pembagiannya didasarkan pada tipe batuan dan morfologi yang spesifik yang hubungannya erat dengan sifat tanah yang spesifik. Grup yang lainnya sebahagian besar hanya berdasarkan pada morfologi.

Untuk semua satuan lahan, data keadaan tanah dan hubungan tanah dengan bentang alam disajikan pada Uraian

## USER MANUAL

*This booklet is an explanation of the 1:250,000 scale Land Unit and Soil map of the Sidikalang mapsheet (0618), Sumatra.*

*The legend of the map consists of Land Units, which are geomorphic units, delineated by interpretation of images such as aerial photographs, satellite imagery and Synthetic Aperture Radar. The contents of each of the units is checked in the field and recorded. Only part of this information can be represented in the map; the remainder is briefly documented in the present explanatory notes, and more complete information is available upon request.*

*Map symbols indicate physiographic group (capital letter), rock type (lower case letter), and subdivisions according to slope and dissection (in sloping and uplifted areas) or to sedimentary/hydrological environment (in recent alluvial and marine areas), indicated with numbers. Lower case letters preceding the physiographic group code are used to indicate covers of material with differing composition, such as volcanic ash covers on hills of sedimentary rocks, or thin peat on alluvial plain units.*

*The physiographic groups are : Peat Domes, Alluvial, Marine, Marine Terrace, Acid Tuff Plains, Plains, Toba Acid Tuff, Volcanic, Karst, Hill, Mountain/Plateau and Miscellaneous. The Acid Tuff Plain, the Toba Acid Tuff, the Volcanic, the Peat Domes and the Karst group are based on rock type and specific morphology, with a close link to specific soil characteristics. The other groups are largely morphological.*

*For all land units, data on soils and soil/landscape relations are presented in the Land Unit Descriptions. These*

Satuan Lahan. Uraian satuan lahan ini merupakan bagian terpenting dari Buku Keterangan ini sebab semua informasi yang diperlukan untuk mengevaluasi setiap satuan lahan untuk penggunaan tertentu ada disini.

Semua informasi geografik dapat diperoleh dalam format komputer (didigitasi). Semua data utama dari tanah (dari profil yang dianalisis) juga disimpan dalam komputer dan dapat tersedia bagi para pemakai yang memerlukan. Pada tahap selanjutnya, perangkat lunak untuk evaluasi lahan yang mempergunakan parameter parameter yang ada pada diskripsi satuan lahan akan segera disediakan oleh Proyek Pengelolaan Data Base Tanah (PDBT).

Permintaan untuk penilaian Kesesuaian Lahan dari tiap satuan lahan untuk berbagai keperluan dapat diajukan ke Pusat Penelitian Tanah, Bogor.

*descriptions form an essential part of the Explanatory Notes, because all information that is necessary to evaluate a land unit for specific uses is listed here.*

*All geographic information is available in computer (digitized) format. All primary soil information (analyzed profiles) is also computerized and can be made available to the user. At a later stage, land evaluation software which uses the parameters listed in the Land Unit Descriptions will be made available by the Soil Data Base Management Project (SDBM).*

*Requests for suitability ratings of the land units for various purposes can be submitted to the Center for Soil Research, Bogor.*

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## **1. PENDAHULUAN**

### **1.1. Latar belakang**

Buku Keterangan dan Peta Satuan Lahan & Tanah ini merupakan sebagian hasil akhir survei tanah tinjau Sumatra yang dilaksanakan untuk Proyek Perencanaan dan Evaluasi Sumber Daya Lahan dan diprakarsai tahun 1985 oleh Pemerintah Indonesia serta dibiayai oleh Bank Pembangunan Asia.

Pelaksanaan survei dilakukan antara bulan November 1987 dan Maret 1988 oleh Tim Survei Tanah dari Pusat Penelitian Tanah, sedangkan korelasinya dilakukan pada bulan November - Desember 1988.

### **1.2. Konsepsi legenda**

Legenda untuk survei ini didasarkan pada pendekatan satuan lahan. Pendekatan ini dianggap paling sesuai untuk survei ini, sebab pada skala 1:250.000 dengan intensitas pengamatan lapangan yang kurang, semua batas satuan dapat ditarik dengan cara menginterpretasi citra. Legenda satuan lahan memungkinkan adanya pembatasan setiap satuan dengan sembarang ukuran yang masih dapat dipetakan (tergantung skala peta) dengan memanfaatkan nama-nama morfologi sederhana dan berulang. Pendekatan ini menunjang struktur hirarki dan merupakan sistem terbuka sehingga dapat diperbaharui sesuai dengan penerapannya di Indonesia; ia tidak memuat parameter iklim (parameter iklim disimpan dalam data base terpisah dan dapat digabung dengan data base satuan lahan). Tambahan pula legenda satuan lahan erat hubungannya dengan legenda terdahulu di Indonesia mengenai bentuk lahan, sistem lahan dan satuan lahan tanpa keliru penggunaanya (Desaunettes, 1977; RePPProT, 1985-1988; Kips et al., 1981).

Satuan Lahan ini diberi batasan berupa lahan dimana satu atau lebih komponennya mempunyai ciri-ciri khusus dan merupakan satuan lingkungan dengan sembarang ukuran yang dapat dibatasi pada peta. Satuan terkecil yang masih

## **1. INTRODUCTION**

### **1.1. Background**

*This explanatory booklet and the included maps are part of the final results of the reconnaissance soil survey of Sumatra, which was carried out for the Land Resources Evaluation and Planning Project (LREP), initiated in 1985 by the Goverment of the Republic Indonesia and financed by the Asian Development Bank.*

*The sheet was surveyed between November 1987 and March 1988, by teams of Center for Soil Research (CSR). Map correlation was done in November - December 1988.*

### **1.2. Legend concept**

*The legend for this survey is based on the Land Unit approach. This approach is considered most suitable for this survey, because at a scale of 1:250,000, with low-density field checks, all unit boundaries are obtained by image interpretation. The land unit legend allows the delineation of mappable units of any size (depending on map scale), it makes use of morphological names which are simple and recurrent, it supports an hierarchical structure, it is an open system that can be amended for use anywhere in Indonesia, and it does not contain climatic parameters (the climatic parameters are stored in a separate data base which can be combined with the land unit data base).*

*Furthermore, the land unit legend is closely related to previous Indonesian land form, land system and land unit legends (Desaunettes, 1977; RePPProT, 1985-1988; Kips et al., 1981) without being confusing.*

*A Land Unit is defined here as an area of land of which one or more attributes have special characteristics, and it refers to an environmental unit of any size that can be delineated. The smallest unit that can be*

dapat dibatasi tanpa menghiraukan sekalanya berukuran 2 mm lebarnya bila bentuk memanjang dan kurang lebih 3 sampai 4 mm bila berbentuk bulat. Pada skala 1:250.000, suatu satuan yang membulat dengan diagonal 4 mm meliputi kurang lebih 80 ha.

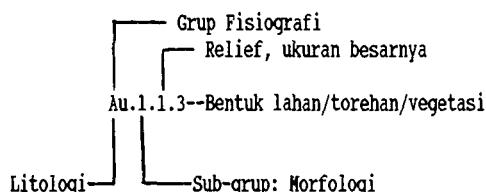
Satuan lahan dikelompokkan dalam grup-grup fisiografi dan kadang-kadang dibagi lagi kedalam sub-grup.

Untuk informasi lebih lengkap, lihat pada Buurman et al (1988) dan Balsem et al. (1989)

### 1.3. Struktur legenda satuan lahan

Semua satuan lahan diberi kode berupa huruf dan angka/digit; masing-masing dengan konotasi khusus tergantung tingkat klasifikasinya.

Contoh: Au.1.1.3- Dataran aluvial luas, tanggul sungai/alur-alur drainase.



Tabel 1 menyajikan Grup Fisiografi yang diidentifikasi di Sumatra dan pulau-pulau di luarnya. Contoh-contoh pembagian lanjut hanya disajikan untuk grup Kubah Gambut dan grup Dataran.

Tabel 1. Grup Fisiografi

- |                      |    |
|----------------------|----|
| A. ALUVIAL           |    |
| B. MARIN             |    |
| D. KUBAH GAMBUT      |    |
| H. PERBUKITAN        |    |
| I. DATARAN TUF MASAM | *) |
| K. KARST             |    |
| M. PEGUNUNGAN/PLATO  |    |
| P. DATARAN           | *) |
| Q. TUF MASAM TOBA    |    |
| T. TERAS MARIN       |    |
| V. VOLKAN            |    |
| X. ANEKA BENTUK      |    |

\*) Tidak dijumpai pada lembar peta ini.

delineated on any map, irrespective of scale is about 2 mm wide if it is a linear feature and about 3 to 4 mm across if it is a circular feature.

At a scale of 1:250,000, a circular unit of 4 mm across has a surface of nearly 80 ha.

Land units are grouped together in Physiographic Groups and, in some cases, in Sub-Groups.

For more detailed information, see Buurman et al., (1988) and Balsem et al., (1989)

### 1.3. Structure of the land unit legend

All mapping units are coded by means of a sequence of characters and digits, each with its specific connotation which depends on its level in the classification.

Example: Au.1.1.3 -Broad Alluvial Plain; levee/spillway.

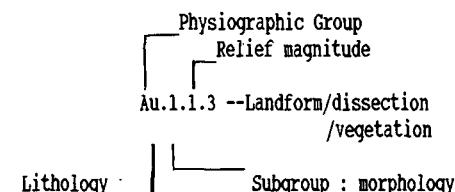


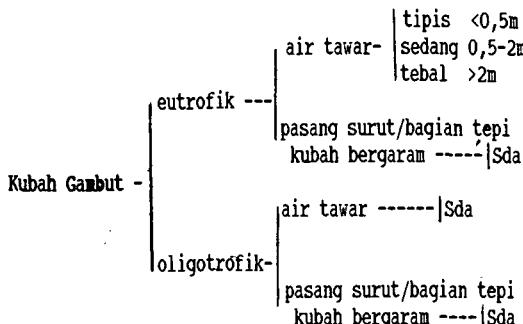
Table 1 lists the Physiographic Groups which have been identified in Sumatra and the outer islands. Examples of subdivisions are given for the Peat Dome and Plain groups only.

Table 1 : Physiographic Groups

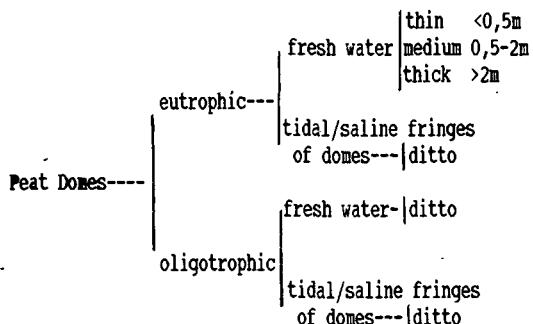
- |                     |    |
|---------------------|----|
| A. Alluvial         |    |
| B. Marine           |    |
| D. Peat Domes       |    |
| H. Hilly            |    |
| I. Acid Tuff Plain  | *) |
| K. Karst            |    |
| M. Mountain/Plateau |    |
| P. Plain            | *) |
| Q. Toba Acid Tuff   |    |
| T. Marine Terrace   |    |
| V. Volcanic         |    |
| X. Miscellaneous    |    |

\*) Not present in this mapsheet.

Pembagian lanjut grup Kubah Gambut dan Dataran adalah sebagai berikut.



*Subdivision of the Peat Domes and Plain groups :*



Bentuk wilayah	Penorehan
datar-----	tanpa sedikit sedang sangat ekstrim
datar - berombak-----	Sda
berombak -----	Sda
berombak - bergelombang-----	Sda
bergelombang-----	Sda
datar berbukit kecil ---	Sda
berombak berbukit kecil	Sda

Land form	Dissection
flat-----	none
	slight
	moderate
	strong
	extreme
flat to undulating-----	ditto
undulating-----	ditto
undulating to rolling---	ditto
rolling-----	ditto
flat with hillocks-----	ditto
undulating with hillocks	ditto

Struktur legenda disusun demikian rupa sehingga lanskap datar, melandai, tertoreh, bergunung, dsb. dengan mudah dapat dipilih oleh komputer. Struktur ini langsung berkaitan dengan potensi lahan untuk pertanian.

*The legend structure is such, that flat, sloping, dissected, mountainous landscapes, etc., are easily selected by computer. The structure is directly related to agricultural potential of the land.*

## 2. METODOLOGI

### 2.1.Peta dasar

Peta dasar untuk keperluan pencetakan Peta Satuan Lahan & Tanah disediakan oleh BAKOSURTANAL. Untuk lembar peta ini, peta dasar yang digunakan adalah peta JOINT OPERATIONS GRAPHICS (JOG), Lembar NA47-6, Seri 1501, Edisi 2, Tarutung, yang dikeluarkan oleh Royal Australian Survey Corps, 1987.

## 2. METHODOLOGY

### 2.1.Base maps

*Base maps for the printed Land Unit and Soil map were provided by BAKOSURTANAL. For the present sheet, the base map was the Joint Operations Graphics (JOG), Sheet NA47-6, Series 1501, Edition 2, Tarutung, published by The Royal Australian Survey Corps 1987.*

## 2.2. Interpretasi citra

Survei tinjau ini sebahagian besar didasarkan pada interpretasi citra dan batas-batas satuan sesungguhnya ditarik berdasarkan citra. Macam citra yang digunakan adalah sebagai berikut:

- potret udara hitam/putih sekala 1:100.000, Angkatan Udara Australia 1976 (umumnya kualitas rendah karena dicetak berulang kali dan pemrosesan yang kurang baik).
- LANDSAT komposit warna (band 4-5-6) sekala 1:250.000 tahun 1984/85 yang diperoleh dari LAPAN (kualitas bervariasi, sekala kurang teliti).
- citra Radar stereo STAR-1, 1988 (cetakan hitam putih, kualitas tak optimal).

## 2.3. Survei dan data lapangan.

Pelaksanaan survei tinjau dapat dibagi dalam beberapa tahapan kerja:

1. penelaahan data dan informasi dari peta dan laporan tersedia.
2. interpretasi citra dan penetapan daerah kunci
3. pengamatan lapangan dan pemasukan data ke komputer
4. penyusunan satuan lahan dan pemasukan data ke komputer.
5. analisis contoh tanah
6. melengkapi uraian satuan lahan dengan data analisis.
7. korelasi/verifikasi lapangan
8. produksi peta akhir
9. dijitalisasi peta dan pemrosesan data base lainnya.

Semua pengamatan di lapangan (pemboran dan profil) dicatat, diberi kode dan dimasukan sesuai dengan prosedur standar PDBT, seperti diuraikan dalam Laporan Teknis PDBT No.5 (Balsem et al., 1988). Kode ini terutama diadaptasi dari standar FAO dan USDA (FAO, 1977; SCS, 1978; Gallup, 1978).

Contoh tanah yang representatif dianalisis sifat-sifatnya seperti yang disajikan pada Tabel 2.

## 2.2. Image interpretation

The surveys are extensively based on image interpretation and virtually all unit boundaries are imagery-based. The following imagery was used:

- 1:100,000 scale black/white aerial photography, Australian Airforce, 1976, (usually poor quality due to recopying and poor processing).
- 1:250,000 LANDSAT colour composites (bands 4-5-6), 1984/85, obtained from LAPAN (varying quality, inaccurate scale).
- 1:250,000 STAR-1 stereo Radar imagery, 1988 (black/white positive prints, quality not optimal).

## 2.3. Field survey and field data

The implementation of the reconnaissance survey can be split up into a number of essential steps :

1. perusal of existing maps and reports
2. image interpretation and selection of sample/key areas
3. field observations and computer data entry
4. preliminary land unit descriptions and computer data entry
5. soil sample analyses
6. completion of land unit descriptions with analytical data
7. correlation/field verification
8. final map production
9. map digitizing and other data base operations.

All observations in the field (augerings and profile pits) were described, coded and entered according to standard SDBM procedures as described in SDBM Technical Report No.5 (Balsem et al., 1988). These codes are mainly adapted from standard FAO and USDA codes (FAO, 1977; SCS, 1978; Gallup, 1978).

Representative soils were analyzed for the properties listed in Table 2.

Tabel 2. Analisis tanah standar dan tambahan PDBT.

Analisis Standar

1. tekstur
2. karbon organik
3. KTK NH<sub>4</sub>OAc pH 7
4. basa dapat ditukarkan dalam NH<sub>4</sub>OAc
5. Al dalam KCl 1M
6. kerapatan lindak pF 2,5
7. kadar air pF 4,2
8. pH (H<sub>2</sub>O, KCl, 1:2,5)
9. N total
10. K tersedia
11. P tersedia

Analisis tambahan

untuk tanah volkanik:

- kemasaman terekstraksi dalam BaCl<sub>2</sub>-TEA (pH 8.2)
- Al, Fe dan Si terekstraksi oksalat
- mineralogi pasir
- retensi fosfat

untuk Oxisol:

- mineralogi pasir

untuk Spodosol:

- Fe, Al, C terekstraksi pirofosfat
- Fe, Al terekstraksi ditionit

untuk endapan marin:

- garam terlarut
- kadar sulfur
- kadar air lapangan (tanah belum matang)

untuk tanah berkapur:

- kadar karbonat

untuk tanah Gambut:

- kadar serat
- kadar abu
- kerapatan lindak

2.4. Uraian satuan lahan

Uraian satuan lahan berupa uraian umum yang dibuat untuk setiap satuan peta. Uraian yang dibuat ini merupakan generalisasi dari beberapa pengamatan. Atribut satuan lahan (lihat bab 5.2) digunakan untuk evaluasi lahan ybs. Struktur uraian satuan lahan didasarkan pada suatu cara yang telah dipublikasikan oleh RePPProT (1988) dengan beberapa tambahan. Disamping dari pengamatan di lapangan dalam penyusunan uraian satuan lahan ini,

Table 2. Standard and additional SDBM soil analyses.

Standard Analyses

1. texture
2. organic Carbon
3. CEC NH<sub>4</sub>OAc pH 7
4. exch. Bases in NH<sub>4</sub>OAc
5. Al in 1 M KCl
6. bulk density pF 2.5
7. water content pF 4.2
8. pH (H<sub>2</sub>O, KCl, 1:2.5)
9. total N
10. available K
11. available P

Additional Analyses

for Volcanic soils:

- extractable acidity in BaCl<sub>2</sub>-TEA
- oxalate extractable Al, Fe and Si
- sand mineralogy
- phosphate retention

for Oxisols:

- sand mineralogy

for Spodosols:

- pyrophosphate extractable Fe, Al, C

for marine deposits:

- soluble salts
- sulphur content
- field moisture content (unripe soils)

for calcareous soils:

- carbonate content

for peat soils:

- fibre content

- ash content

- bulk density

2.4. Land unit description

Land Unit descriptions are general descriptions which are made for each of the mapping units. Such descriptions are generalizations of point observations. The land unit attributes (5.2) are used for land evaluation. The structure of the land unit descriptions is based on those published by RePPProT (1988) with amendments. In addition to the field observations, the following sources were

juga dipergunakan beberapa informasi lain terutama dari :

- RePPProT, 1988: Review of Phase I Results, Sumatra.
- PPPG, 1983: Peta Geologi Lembar Sidikalang, Sumatera, Sekala 1:250.000.
- Semua laporan survei yang tersedia dari daerah ybs (Gambar 5).

## 2.5. Data Base dan Pengolahan Data.

Seperti disebutkan diatas, semua data lapangan dan analisis disimpan dalam data base. Data base yang utama ialah:

- pengamatan lapangan (pemboran dan penampang tanah).
- data analisis
- uraian Satuan Lahan

Data base pengamatan lapangan berisi semua parameter yang dapat diukur di lapangan dari setiap tempat pengamatan. Yang dideskripsi dan disimpan adalah nomor tempat/site, tempat, lereng, vegetasi/penggunaan lahan dan semua sifat-sifat tanah yang diukur di lapangan seperti struktur, porositas, tekstur warna, dll. (lihat Laporan Teknis PDBT No 5a, Versi 1.1 - Balsem et al., 1988).

Data base analisis berisi semua hasil analisis kimia, fisika dan mineralogi serta semua data hasil perhitungan dari analisis ini yang biasanya dipergunakan untuk menilai kesuburan atau klasifikasi tanah (Lihat Laporan Teknis No 7a - Buurman, 1988; Laporan Teknis No 17, Muslihat et al., 1989).

Pada data base pengamatan lapangan dan data base analisis, data dapat dikeluarkan dengan cara memanggil /menuliskan nomor pengamatan, nomor lembar peta, satuan pada legenda, administrasi (kabupaten atau provinsi) atau dengan yang lainnya yang ditentukan oleh koordinat geografik.

Data base uraian satuan lahan berisi uraian umum dari tiap satuan peta untuk seluruh Pulau Sumatera yang dikatalogkan menurut lembar peta.

used in the compilation of the land unit descriptions:

- RePPProT, 1988 : Review of Phase I Results, Sumatra
- GRDC, 1982 : Geologic Map of the Sidikalang Quadrangle, Sumatra, Scale 1:250 000.
- All available survey reports for the area (Figure 5).

## 2.5. Data bases and data processing

As mentioned above, all field and analytical data are stored in computerized data bases. The main data bases are :

- field observations (auger and pit).
- analytical data
- land unit descriptions

The field observations data base contains all parameters that were measured in the field, for each of the observations sites. Described and stored are site number, location, slope, vegetation/landuse and all soil properties that are measured in the field, such as structure, porosity, texture, colour etc (see Technical Report No 5, Version 1.1 - Balsem et al., 1988).

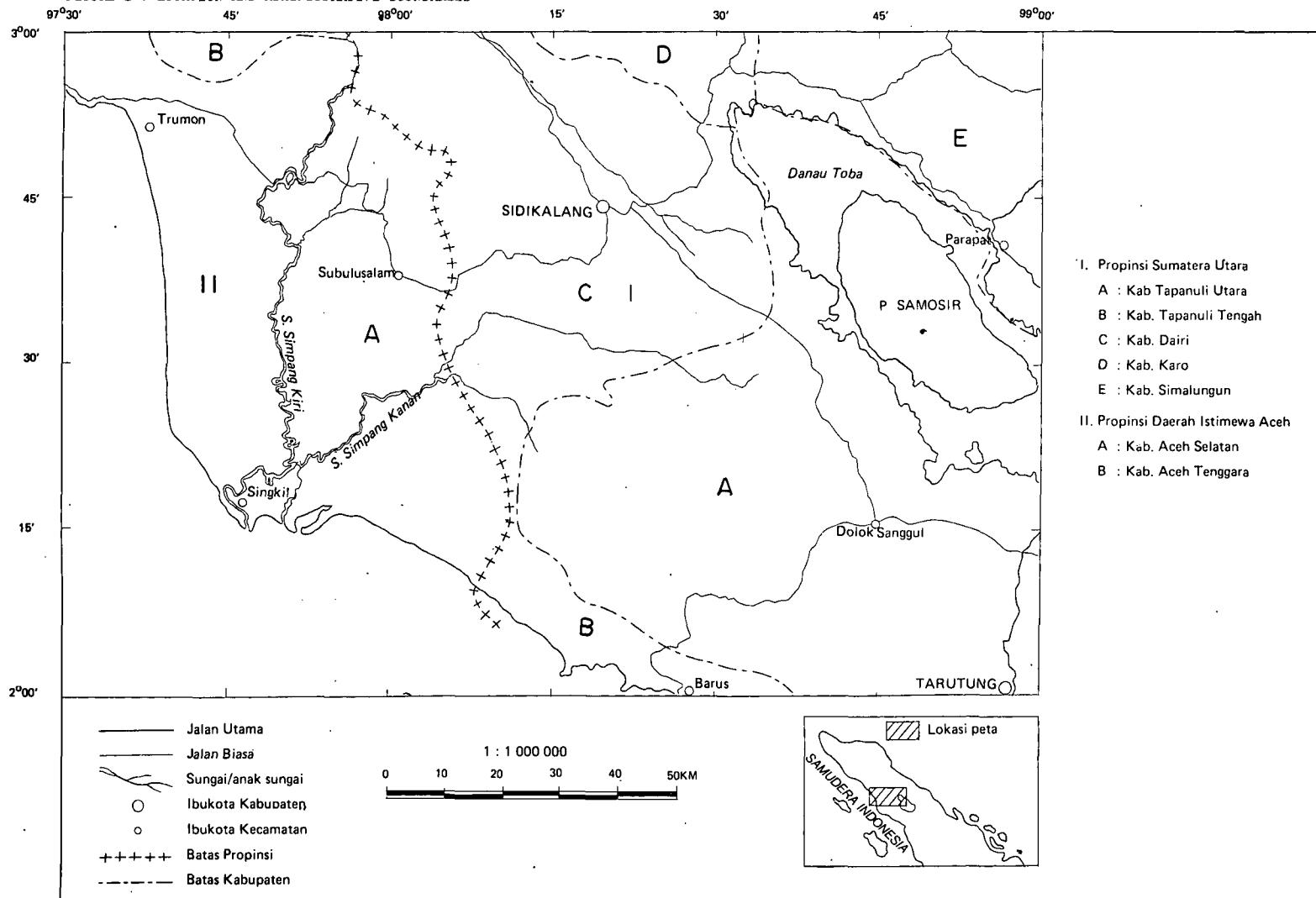
The analytical data base contains all results of chemical, physical and mineralogical analyses and all properties used for fertility appraisal or classification, that are calculated with these analyses (see Technical Report No 7 - Buurman, 1988; and Technical Report No 17 - Muslihat et al., 1989).

In both the field observations and in the analytical data base, data can be retrieved by observations number, map-sheet, legend unit, administrative area (province, kabupaten), and other areas defined by geographic coordinates.

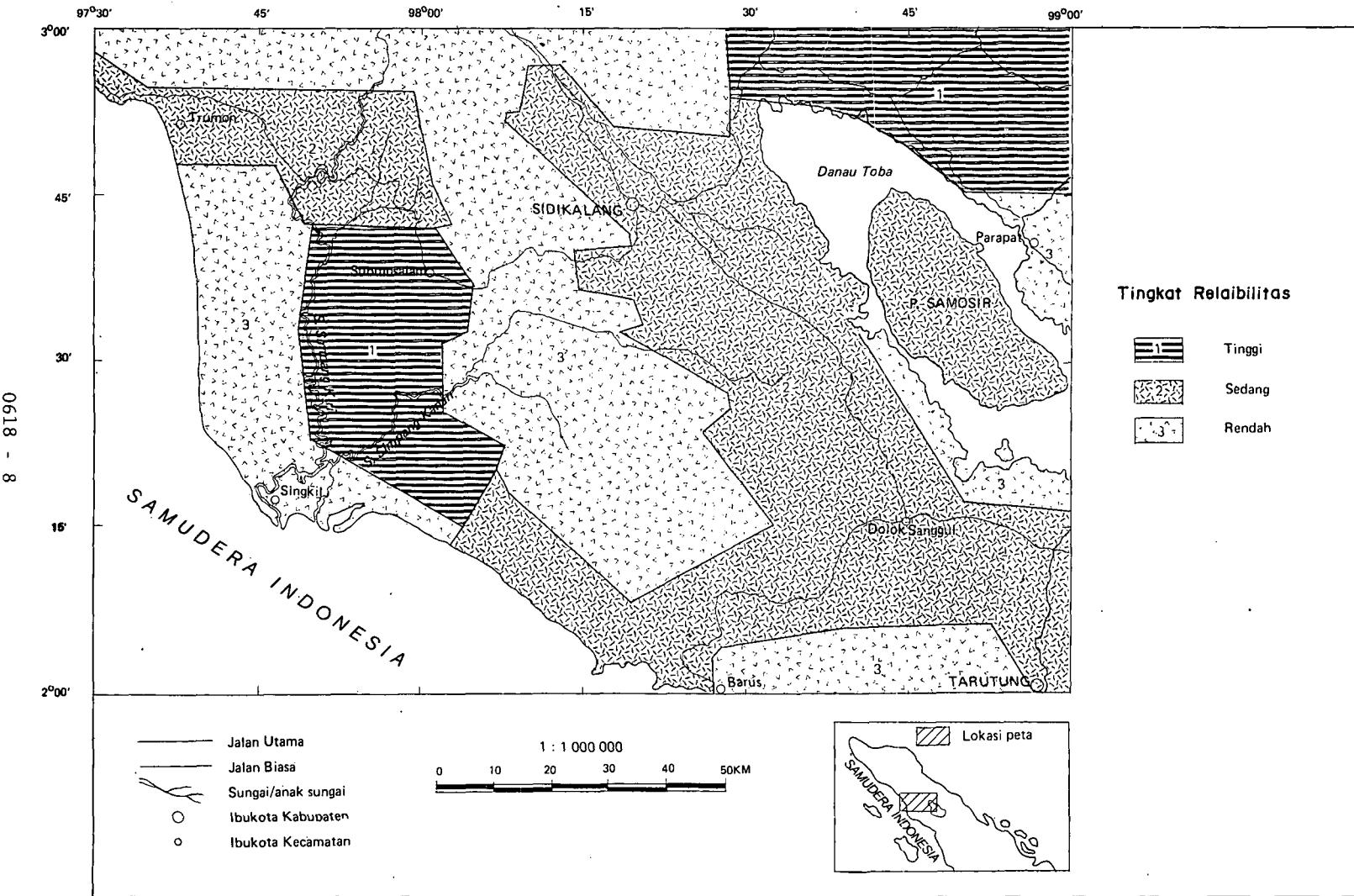
The land unit description data base contains the general description of each mapping unit for the whole island of Sumatra, catalogued by mapsheet.

GAMBAR 1 : LOKASI PETA DAN BATAS ADMINISTRATIF  
 FIGURE 1 : LOCATION AND ADMINISTRATIVE BOUNDARIES

0618 - 7



GAMBAR 2 : RELIABILITAS PETA  
FIGURE 2 : MAP RELIABILITY



Uraian umum berasal dari penyederhanaan semua pengamatan pada seluruh satuan peta, termasuk analisis laboratorium dari profil yang lain. Parameter yang disimpan berisi semua informasi yang diperlukan untuk penilaian evaluasi lahan (lihat Laporan Teknis No 13a -Balsem & Buurman, 1989). Uraian satuan lahan dari semua satuan peta yang terdapat dalam lembar peta ini disajikan pada Lampiran 1.

## 2.6.Relaibilitas peta

Relaibilitas dari peta tergantung pada beberapa faktor seperti: kerapatan pengamatan, keragaman tanah, kualitas dari citra penginderaan jauh, lokasi dari titik pengamatan atau daerah kunci, ketepatan dari batas tanah maupun batas satuan lahan, tingkat pengetahuan dan pengalaman surveyor. Tidak semua dari faktor faktor ini dapat diukur dan karena itu harus diperkirakan.

Berdasarkan faktor faktor tersebut diatas, terutama kerapatan pengamatan, maka diperkirakan mengenai relabilitas peta, dan untuk itu dibagi menjadi 3 grup (Gambar 2).

The general description is derived by generalizing information of all observations within the mapping unit, including laboratory analyses of separate profiles. The parameters stored contain all the information necessary for land evaluation procedures (see SDBM Technical Report No. 13, - Balsem & Buurman, 1989). The land unit descriptions of all mapping units relevant to the present sheet are listed in Appendix 1.

## 2.6.. Map reliability

The reliability of a map depends on many such factors as observation density, soil homogeneity or complexity, quality of the remote sensing imagery, the location of sample/key areas, accuracy of soil units and soil boundaries, the level of education and the amount of experience of the soil surveyor. Not all of these can be measured and so they have to be estimated.

Based on the above mentioned factors, but mainly on observation density, three classes of map reliability have been established (Figure 2).

### **3. LOKASI DAERAH PETA DAN SUMBER INFORMASI**

#### **3.1. Lokasi dan Batas Administrasi**

Secara geografik daerah peta Sidikalang (0618) yang mencakup Provinsi Aceh dan Provinsi Sumatra Utara terletak antara  $97^{\circ}30'$  dan  $99^{\circ}0'$  Bujur Timur dan antara  $2^{\circ}$  dan  $3^{\circ}$  Lintang Utara.

Daerah peta meliputi 7 kabupaten, yakni Aceh Selatan, Aceh Tenggara, (Provinsi D.I. Aceh), Dairi, Tapanuli Utara, Tapanuli Tengah, dan sebagian Karo dan Simalangun (Provinsi Sumatera Utara); lihat Gambar 1.

#### **3.2. Sumber Informasi**

Dalam pelaksanaan survei dan pemetaan tanah tingkat tinjau ini sumber informasi yang telah digunakan adalah peta topografi, peta geologi, potret udara, citra landsat, citra Radar serta beberapa peta dan laporan survei terdahulu sebagai nara sumber.

Disamping peta topografi skala 1:250.000 (BAKOSURTANAL , 1985) digunakan pula peta topografi berskala 1:50.000 (1982) yang diperoleh dari BAKOSURTANAL. Lembaran peta dan nomornya disajikan pada Tabel 3.

**Tabel 3. Nomor dan Nama Lembaran Peta Topografi Skala 1:50.000**

11 --	41 Balok Seuma
12 Singkil	42 Rundeng
13 Kuala Baru	43 Trumon
14 --	44 Kuala Kepeng
21 Saraqi	51 Subulussalam
22 Barus	52 Sidikalang
23 Kotabaru	53 Tigalingga
24 Parlilitan	54 Tanjung Beringin
31 Onan Ganjang	61 Pangururan
32 Tarutung	62 Prapat
33 Dolok Sanggul	63 Saribudolok
34 Muara	64 Sondi

Peta geologi yang digunakan ialah Peta geologi skala 1:250.000 dari Pusat Penelitian dan Pengembangan Geologi Bandung lembar Sidikalang (0618) tahun

1982.

Potret udara yang dipakai ialah potret udara hitam/putih skala 1:100.000 (Royal Australian Air Force, 1976) berkualitas rendah sampai sedang dengan tutupan awan lk. 10%. Ikhtisar jalur terbang dan Nomor photo disajikan pada Gambar 3. Sumber informasi lain yang dipakai ialah dari Citra Landsat dan Radar seperti disajikan dalam Gambar 4.

Beberapa laporan survei tanah terdahulu beserta peta tanahnya telah ditelaah dalam pekerjaan kompilasi data untuk memperkokoh data base tanah daerah ybs. Gambar 5 menyajikan lokasi daerah survei, sedangkan judul laporan survei dicantumkan pada Daftar Pustaka.

### **4. KEADAAN UMUM FISIK DAERAH**

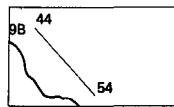
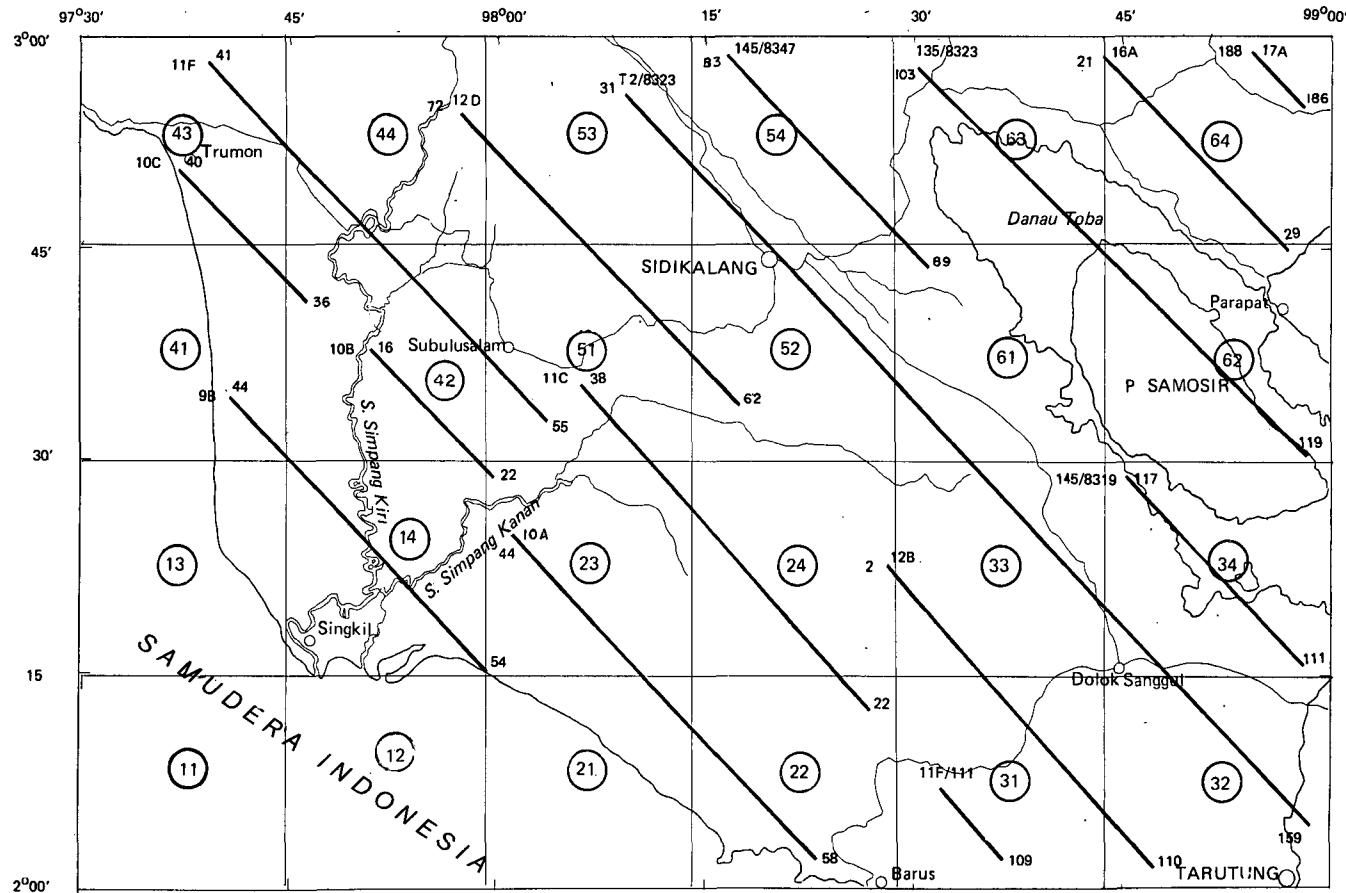
#### **4.1. Fisiografi**

Berdasarkan bentang alamnya lembar peta Sidikalang dapat dibagi menjadi 6 (enam) grup utama yaitu rangkaian Pegunungan Barisan, Kaki Perbukitan Barisan, Teras Marin, Dataran Rendah, Plato Toba dan Depresi Toba.

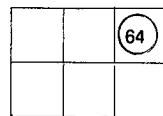
#### **Rangkaian Pegunungan Barisan**

Hampir seluruh rangkaian pegunungan Barisan masuk grup pegunungan. Pegunungan ini memanjang arah barat laut - tenggara dengan punggung dan lembah-lembah yang tidak teratur. Puncak-puncaknya berada pada ketinggian antara 2000-3000m dpl. Sisa rangkaian pegunungan yang lebih kecil dijumpai disebelah barat laut Danau Toba, yang merupakan lanjutan rangkaian pegunungan pada lembar Pematangsiantar (0718). Diantara kedua rangkaian tersebut terdapat jalur patahan utama. Sebagian besar kaki lereng pegunungan ini tertutup eflata dari erupsi toba, yang menutupi daerah pegunungan dibagian timur lembar peta ini. Bagian barat pegunungan ini dibatasi oleh jalur patahan lainnya, dimana disebelah baratnya lagi dijumpai kaki perbukitan. Semua pegunungan kapur yang mempunyai ciri-ciri khusus dimasukkan pada grup Kars.

GAMBAR 3 : INDEKS PETA TOPOGRAFI DAN JALUR TERBANG POTRET UDARA  
 FIGURE 3 : INDEX OF TOPOGRAPHIC MAPS AND FLIGHT LINES OF AERIAL PHOTOGRAPHY

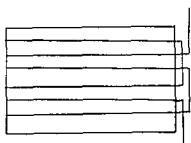
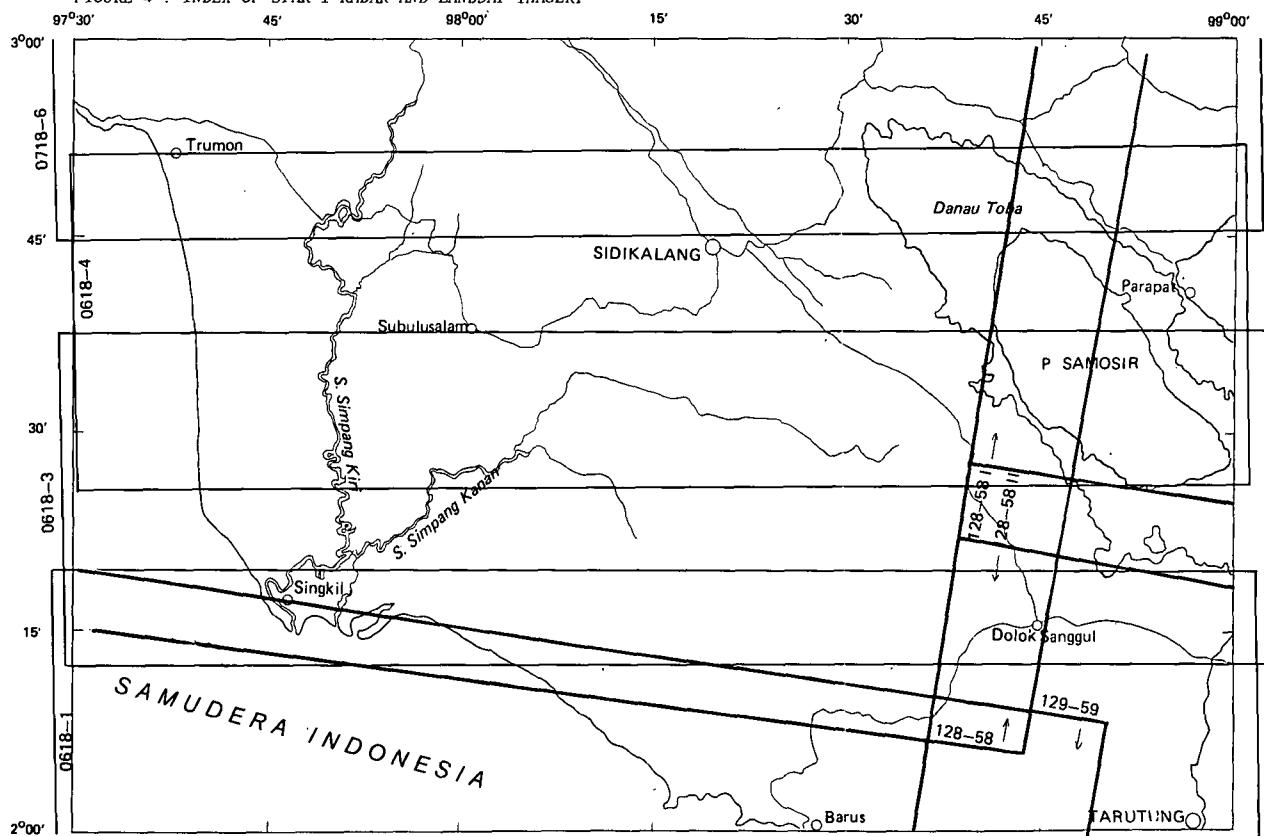


98 : Nomor jalur terbang  
 44,54 : Nomor foto udara

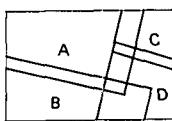


64 : Nomor lembar peta topografi 1 : 50 000

GAMBAR 4 : INDEKS CITRA RADAR STAR-I DAN LANDSAT  
 FIGURE 4 : INDEX OF STAR-I RADAR AND LANDSAT IMAGERY

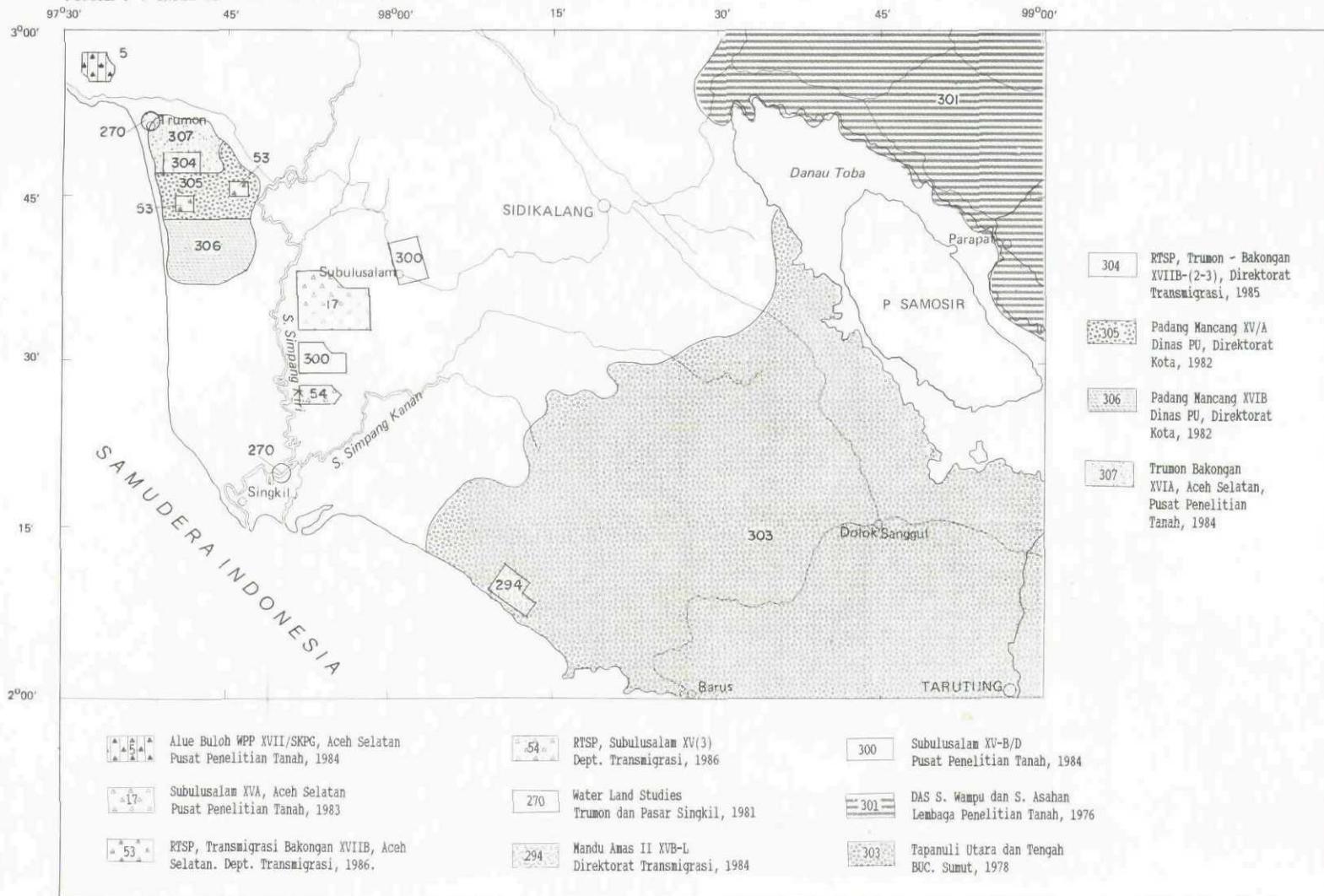


Liputan radar 1 : 250,000  
 STAR - 1/1938, 0618-1,3,4,6

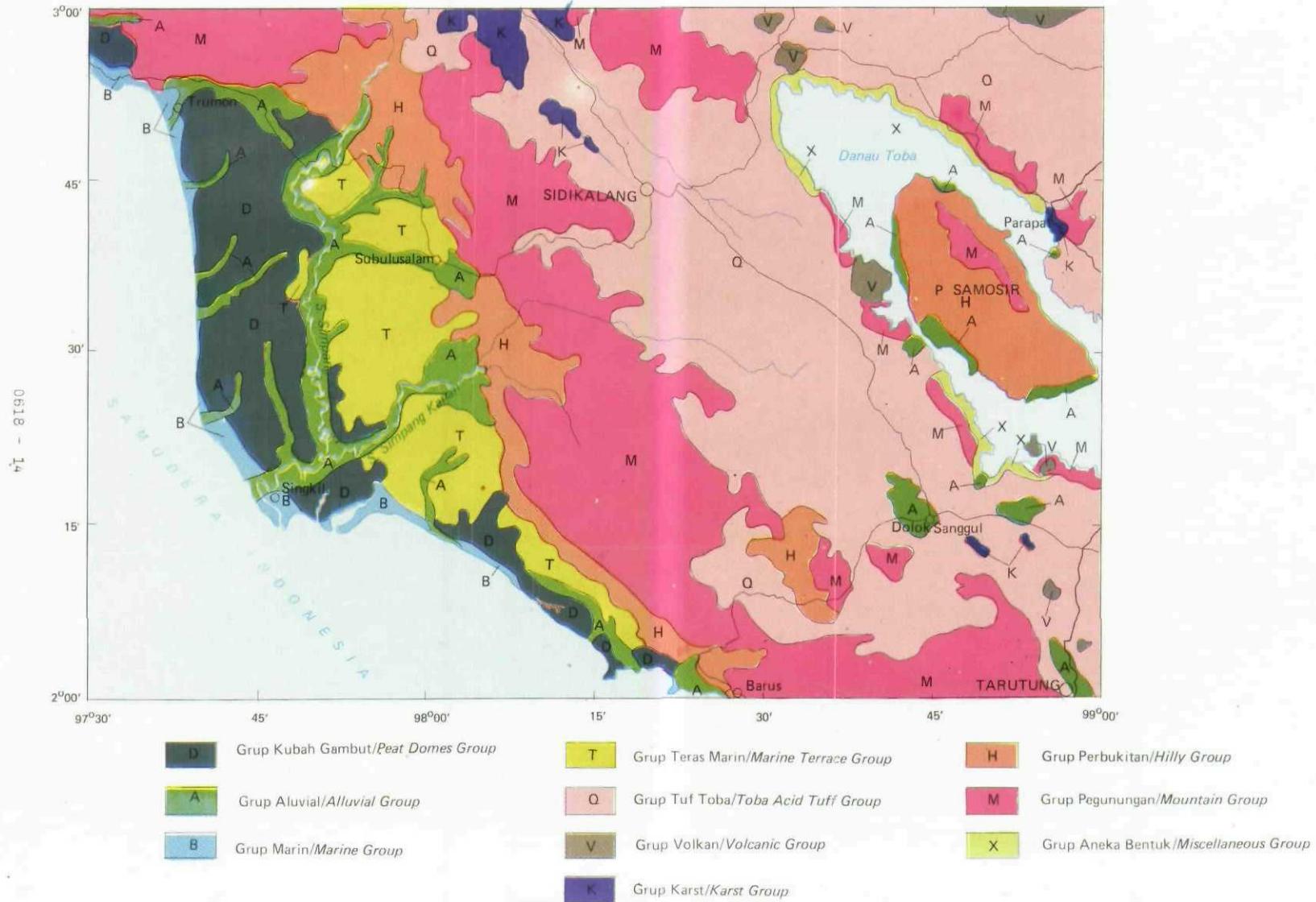


Liputan Citra Landsat 1 : 250,000  
 A 128-58, 08-08-85  
 B 129-58, 08-08-85  
 C 128-58I, 08-08-85  
 D 128-58 II, 08-08-85

GAMBAR 5 : INDEKS LAPORAN SURVEI DAN PEMETAAN TANAH  
 FIGURE 5 : INDEX OF SOIL SURVEY REPORTS



GAMBAR 6 : GRUP FISIOGRAFI LEMBAR SIDIKALANG  
 FIGURE 6 : PHYSIOGRAPHIC GROUPS OF THE SIDIKALANG SHEET



### **Kaki Perbukitan**

Kaki perbukitan dimasukkan pada grup Perbukitan. Umumnya perbukitan ini terjadi oleh aktivitas tektonik yang lebih muda dengan perbedaan tinggi <300m, tersusun oleh batuan yang lebih muda dibanding batuan di daerah rangkaian pegunungan Barisan, terutama berupa batuan volkan tersier. Karena batuan tersebut telah mengalami pelipatan yang kuat dan keadaan morfologi volkannya tidak nampak jelas, maka bentang alam ini dimasukkan pada grup Perbukitan.

Beberapa perbukitan mempunyai puncak yang cukup tinggi, seperti Gunung Kapur (1095m), Gunung Dasan (795m) dan Sinampalu (827m). Daerah ini dikelasifikasikan sebagai daerah perbukitan karena perbedaan ketinggian dibandingkan daerah sekitarnya, bukan karena ketinggian sebenarnya (dari permukaan laut).

Seperti halnya pada grup Pegunungan, perbukitan yang litologinya dominan batukapur dan mempunyai ciri khusus dimasukkan dalam grup Kars.

### **Teras Marin**

Teras ini merupakan kelanjutan dari penyebaran kaki perbukitan. Daerah ini merupakan hasil pengendapan marin tua dan pra-marin yang diangkat dan mencapai ketinggian 10-50m dpl. Sebagian daerah teras marin ini telah tererosi berat, sedang bagian yang lebih rendah pada umumnya belum tererosi. Batas antara grup Teras Marin dengan Dataran pantai biasanya berbentuk lereng terjal.

### **Dataran Rendah**

Secara morfologi daerahnya dibagi menjadi 3 grup besar yaitu: grup Marin, grup Aluvial dan grup Kubah Gambut. Grup Marin merupakan jalur-jalur sempit sepanjang pantai berupa beting pantai dan lembah-lembah antar beting, yang kadang-kadang merupakan sisa dataran mangrove.

Grup Aluvial terdiri dari sabuk meander dan rawa belakang dari sungai-sungai yang berasal dari rangkaian pegunungan Barisan, mengalir

kearah barat kelautan Indonesia. Beberapa sungai dibelakang Kubah Gambut atau dibelakang beting pantai mengalir paralel ke pantai.

Bagian lain Grup Aluvial terdiri dari kipas aluvial dan koluvial dari berbagai komposisi dan juga pelembahan tertutup (didaerah Plato Toba).

Sebagian besar dari dataran rendah tertutup oleh grup Kubah Gambut. Kubah Gambut ini dijumpai sepanjang pantai barat, antara beting pantai dan pelembahan sungai. Kerah timur daerahnya dibatasi sebelah timur oleh sungai-sungai yang mengalir sejajar ke pantai atau oleh lereng terjal dari Teras Marin.

### **Plato Toba**

Plato Toba (grup Tuf Toba Masam) terbentuk oleh ignimbrite hasil erupsi Volkan Toba. Aliran abu masam ini (dasit dan liparit) sangat tebal dan kadang-kadang menyatu didekat Toba, membentuk plato yang mencapai ketinggian kurang lebih 1900m didaerah berlereng terjal disebelah selatan P. Samosir dan lerengnya melandai dari Danau Toba ke arah timur laut dan barat daya. Aliran abu Toba ini mengisi sebagian besar daerah pelembahan, sampai ketinggian tertentu dan tuf Toba diketemukan pada kipas dari kaki perbukitan serta teras marin. Sistem patahan Sumatera memotong Plato Toba disebelah barat daya Danau Toba, yang dicirikan oleh banyaknya jalur-jalur patahan kecil yang sering merubah aliran sungai, serta adanya bukit-bukit memanjang sepanjang jalur patahan.

### **Depresi Toba**

Depresi ini dahulunya merupakan pusat erupsi dari volkan Toba. Yang paling mencirikan dari depresi ini ialah adanya lereng yang sangat terjal antara danau dan plato Toba yang mencapai ketinggian maksimum 1000m dibagian barat daya dan adanya Pulau Samosir. Di daerah lereng terjal tersebut dijumpai batuan tua dari rangkaian pegunungan Barisan dan kipas koluvial yang luas.

Pulau Samosir dan daerah seberang danau ke arah timur laut pada pinggir timur dari lembar peta merupakan perbukitan monoklinal. Perbukitan ini merupakan endapan danau yang terangkat. Pada daerah dimana tutupan tuf sangat tebal, daerah yang terangkat ini dimasukkan grup Tuf Masam Toba, sedang jika tidak demikian dimasukkan grup Perbukitan.

Pulau Samosir dipotong oleh patahan-patahan paralel yang mengarah tenggara-barat laut. Patahan ini memotong perbukitan monoklinal ini, membentuk tangga-tangga yang kadang-kadang dipisahkan oleh rekahan-rekahan yang dalam.

#### 4.2. Geologi

Berdasarkan umurnya, keadaan geologi di daerah peta dapat dibagi menjadi Pra Tersier, Tersier dan Kuarter (Gambar 7). Grup fisiografi (Gambar 6) dapat pula digunakan untuk menguraikan keadaan geologi umum dari lembar peta ini.

##### Pre Tersier

Rangkaian Pegunungan Barisan dibentuk oleh batuan Paleozoik (Grup Tapanuli) dan Mesozoik (Grup Peusangan dan Grup Woyla). Grup batuan ini mengandung batuan agak metamorfik (metamorfik rendah) yang terdiri dari berbagai batuan, berupa konglomerat, serpih (shale) dan batukapur. Untuk maksud sekarang hanya batuan yang paling kasar dan batukapur (grup Karst) saja yang dipisahkan. Beberapa batuan vulkan terdapat menyebar di daerah lingkungan sedimen marin ini, namun pada peta geologi tidak dipisahkan.

Batuan intrusif Paleozoik dan Mesozoik seperti terdapat disudut bagian tenggara lembar peta, juga dimasukkan kedalam grup Pegunungan.

##### Tersier

Grup Perbukitan hampir seluruhnya terbentuk oleh batuan Tersier. Pada peta geologi dipisahkan menjadi tiga "super grup" yang disebut Tersier I, II dan III.

Sedimen Tersier ini terbatas dijumpai dibagian barat Pegunungan Barisan, kecuali beberapa singkapan yang dijumpai di daerah dinding-dinding terjal Danau Toba dan dibagian tenggara Plato Toba.

Tersier I terutama tersusun oleh batupasir halus dan batudebu marin dan perimarin. Batuan Tersier II terutama berupa batudebu dan batupasir arkosa, dijumpai pula batukapur tipis dan batuan yang lebih halus.

Tersier III meliputi batuan sedimen yang membentuk teras marin terdiri dari konglomerat, pasir, liat, debu, gambut (lignit) dan lensa tuf yang bercampur aduk.

Sebagian perbukitan tersusun oleh sedimen vulkan Tersier dari berbagai umur dan berbagai pusat erupsi. Bahan vulkan tersebut terutama bersifat andesit. Di beberapa tempat, batuan ini membentuk pegunungan dan dimasukkan pada grup Pegunungan (Satuan Lahan Ma, bagian tenggara lembar peta).

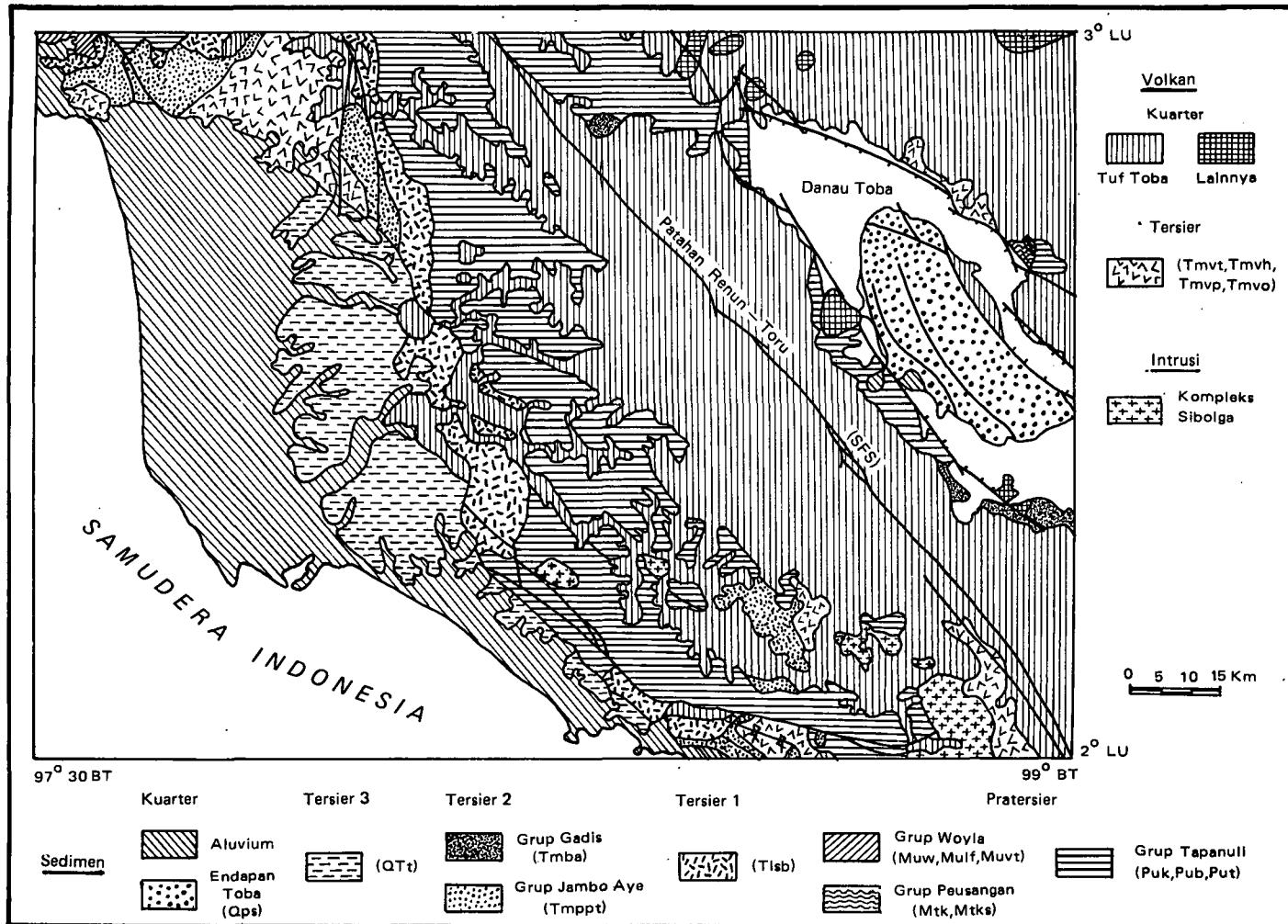
Di utara Danau Toba terdapat sisa vulkan Tersier yang sebagian besar tertutup tuf Toba. Vulkan ini masih memperlihatkan bentukan vulkan aslinya.

##### Kuarter

Bagian terbesar dari batuan Kuarter adalah tuf ignimbrit dari berbagai erupsi Toba, yang menutupi sebagian besar dari lembar peta. Sebagian tuf ini menyatu, dan terdiri dari berbagai tekstur dan komposisi. Mendekati Danau Toba lapisan atasnya lebih kasar dan mengandung banyak batuapung, sedang dibagian tenggara lembar peta ber-tekstur pasir halus, dengan kandungan kuarsa yang tinggi. Tuf Toba masam mudah diidentifikasi dengan banyaknya fragmen kuarsa bening dan berbentuk kristal dengan ketebalan beberapa milimeter.

Aliran abu Toba mengisi lembah-lembah pegunungan dan perbukitan. Pengisian lembah sungai terjadi pada beberapa periode dan dimana pengikisan sangat kuat mengakibatkan terjadinya lereng-lereng yang sangat terjal (escarpment). Tuf Toba ini kira-kira berumur 30.000-100.000 tahun.

GAMBAR 7 PETA GELOGI BAGAN /  
FIGURE 7 GEOLOGICAL SKETCH MAP



Sumber : Geologi Lembar Sidikalang Geological Research and Development Centre, 1983

Beberapa gunung api yang lebih muda terbentuk setelah erupsi Toba. Semuanya terletak dekat Danau Toba seperti halnya disisi timur laut dan selatan. Bahan yang dikeluarkan gunung api tersebut antara andesitik sampai riolitik.

Batuhan sedimen yang diangkat dan berasal dari dasar Danau Toba men-dominasi Pulau Samosir dan sesetempat terdapat ditepi-tepi danau. Sedimen tersebut berupa butiran-butiran halus mengandung lapisan diatomit yang jelas dan batuan berkapur. Sebagian lapisan tersebut menyerupai konglomerat, mungkin berasal dari batuan yang jatuh dari lereng-lereng disekitar danau.

Endapan aluvial muda dan endapan marin membentuk dataran pantai di bagian barat. Endapan tersebut berupa butiran halus, kecuali disepanjang sungai yang keluar dari daerah perbukitan. Sebagian besar dataran pantai tertutup oleh endapan organik.

#### 4.3.Hidrologi

Aspek hidrologi di daerah lembaran peta Sidikalang (0618) sangat penting guna dibahas dalam kaitannya dengan aspek fisiografi yang telah dipaparkan sebelumnya serta pengaruh langsung terhadap sumber daya lahan dan potensi tanah daerah ini.

**Depresi Toba**, merupakan kawasan penangkapan air hujan yang memungkinkan danau dapat mempertahankan permukaan air setinggi lk. 900m dan kedalaman antara 500 dan 1000m pada luasan lk. 110.000 Ha. Danau ini hanya didrainase melalui Sungai Asahan (di lembaran 0718, Pematangsiantar). Dengan ketinggian antara 1300 dan 2000m, eskarpmen sekeliling depresi dan Pulau Samosir memiliki bidang permukaan penangkapan air hujan yang efektif. Untuk mengamankan *catchment area* ini, reboisasi mutlak perlu ditingkatkan dalam rangka pelestarian kawasan Toba.

Seperti dikemukakan sebelumnya bahwa pinggiran depresi Toba (eskarpmen)

terdiri dari batu-batuhan kukuh yang sebagian telah melapuk lanjut, dapat bertahan terhadap gejala longsor. Pada umumnya pola drainase yang berkembang di daerah ini dikendalikan oleh ketahanan batuan terhadap pengikisan serta struktur geologi (*structural control*).

Pulau Samosir yang didominasi oleh batuan sedimen lunak yang kurang porous disamping lereng isoklinal dan stratifikasi endapan, mempunyai tipe drainase sebagian berpola trellis yang diperkuat oleh adanya patahan-patahan yang banyak terdapat di bagian barat, serta paralel/sub paralel.

**Plato Toba** dengan bahan tuf yang porous dan lereng umum yang melandai ke arah barat dan timur memberikan tipe drainase kurang lebih paralel sampai dendritik di daerah peralihan ke kaki Pegunungan Barisan di sebelah barat, dan umumnya dendritik ke timur-laut Danau Toba. Drainase permukaan di Plato Toba yang seakan-akan dibelah oleh patahan Renun-Toru memperlihatkan pola tertentu dan berbeda-beda karena adanya gerakan-gerakan di kawasan sekitar patahan tersebut. Lembah sungai lama yang ditutupi tuf Toba baru sebagian mengalami perubahan aliran sungai. Setempat-sétempat terdapat air terjun, sebagian lembah bertebing sangat curam bahkan hampir tegak tanpa adanya kipas di kaki lembah, seperti yang dijumpai di antara Sipahutar dan Pangaribuan (lembar 0718).

**Pegunungan Barisan** pada garis besarnya mempunyai pola drainase dendritik dan merupakan sumber bagi sungai-sungai terpenting, a.l. S.Cinendang dengan cabangnya L.Kumbih dan L.Souraya, A.Sibahanggu, L.Tapus.

Keadaan tutupan hutan yang umumnya masih utuh di pegunungan Barisan ini memberikan debit air yang cukup stabil di kawasannya sendiri.

**Kompleks Perbukitan** merupakan daerah aliran sungai bagian tengah dari sungai-sungai tersebut di atas. Oleh karena itu kerusakan hutan tutupan di

daerah ini sangat berpengaruh terhadap keadaan hidrologi daerah bawah. Pada umumnya pola drainase di kawasan ini masih dendritik. Pada garis besarnya sebagian hutan tutupan masih utuh namun setempat-setempat terdapat enklafl-enklafl pengalihan ke area pertanian sedangkan bahaya erosi mengancam daerah yang berlereng curam.

Daerah peralihan merupakan daerah terendah tempat keluarannya air yang tertekan, sehingga dibeberapa tempat banyak dijumpai mata air, terutama di kaki perbukitan.

Daerah ini merupakan wilayah dengan bahan pembentuk tanah yang relatif homogen (sedimen laut tua), secara umum mempunyai pola drainase dendritik.

Di daerah yang dekat dengan dataran rendah, dimana bentukan lungur memanjang dijumpai pola drainase paralel/subparalel. Daerah peralihan ini merupakan daerah paling intensif digunakan penduduk setempat, baik untuk usaha pertanian, perkebunan maupun pemukiman. Fluktuasi air daerah ini sangat tergantung ke daerah di atasnya.

**Dataran Rendah** sebagai bagian bawah daerah aliran sungai, maka daerah ini merupakan daerah yang paling peka terhadap ancaman dan bahaya banjir. Daerah antara dua sungai besar berupa rawa belakang masih tergenang permanen sepanjang tahun a.l. di sekitar Barus, Runding-Singkil, sebelah selatan Trumon. Abrasi di sepanjang pantai yang berpasir senantiasa terjadi karena hampasan ombak Samundra Indonesia yang terkenal dahsyat pada musim barat.

## 5. SATUAN LAHAN

### 5.1. Satuan Lahan dan Tanah

Secara garis besar satuan lahan pada lembar peta ini seperti telah disebutkan di atas dapat dikelompokkan kedalam 10 grup, yaitu: Grup Kubah Gambut (D), Aluvial (A), Marin (B), Teras Marin (T), Tuf Toba (Q), Vulkan (V), Karst (K), Perbukitan (H),

Pegungan dan Plato (M) serta Aneka Bentuk Wilayah (X), yang disajikan dalam Gambar 6.

### Grup Kubah Gambut (D)

Di daerah ini dijumpai kubah gambut oligotrofik air tawar, terbentuk di daerah yang relatif cekung sehingga daerahnya tergenang sepanjang tahun. Dalam lingkungan demikian sisa tumbuhan sukar hancur dan menumpuk sebagai gambut dengan atau tanpa campuran endapan tanah mineral. Ketebalan gambut bervariasi antara 2 dan 4m. Bentuk permukaan seperti kubah dengan perbedaan tinggi tidak melebihi 10m.

Bahan organik telah mengalami dekomposisi menjadi hemist dan saprist serta diperkirakan komposisi abunya tidak kaya akan unsur-unsur hara (oligotrofik). Bahan mineral dibawah gambut umumnya miskin unsur baik yang bertekstur halus maupun kasar mengingat bahan asalnya didominasi kuarsa (batuan tua dan tuf Toba).

Penyebarannya terutama terdapat antara Sabulussalam dan Gelombang, sekitar Barus dan Singkil. Terletak pada ketinggian antara 0 dan 10m. Bentuk lahan agak datar, agak cembung dengan lereng kurang dari 3% Luas 119.765 ha (7,95%).

Jenis tanah yang mendominasi satuan lahan ini adalah Troposaprists dan Tropohemists.

Daerah ini pada umumnya untuk jangka pendek tidak mempunyai nilai untuk dikembangkan sebagai daerah pertanian. Kecuali sesetempat dibagian pinggir yang ditempati jenis tanah Tropaquents dapat dijadikan areal untuk persawahan lebak dalam luasan yang sempit dan dengan pengendalian air yang baik.

Penghambat utama di daerah ini adalah kandungan unsur hara/miskin, ketebalan gambut dan genangan permanen.

### Grup Aluvial (A)

Grup Aluvial terutama terbentuk dari endapan sungai, endapan danau serta proses koluviasi di kaki perbukitan

berlereng yang landai.

Penyebarannya terutama di bagian barat lembaran peta berupa jalur aliran sungai, rawa belakang, kipas aluvial/koluvial serta pelembahan sempit. Di sekitar Doloksanggul dan Lintong Nihuta dijumpai pelembahan luas di sekitar Tarutung, dan sesetempat sekitar Danau Toba.

Elevasi di daerah sebelah barat (dataran rendah) berkisar antara 0 dan 100m dpl., sedangkan di daerah lainnya (dataran tinggi) antara 100 dan 1200m dpl. Bentuk wilayah datar, datar agak cembung dan datar agak melandai dengan lereng 0-5% Luas 105.820 ha (7,00%).

Jenis tanah utama yang terbentuk di daerah ini adalah jenis tanah muda yang sebagian besar berasosiasi dengan lingkungan basah antara lain Tropaquepts (telah berkembang), Tropaquents (belum berkembang), sesetempat Fluvaquents yang berlapis-lapis, sedang di daerah cekungan (depresi) dijumpai Tropohemists (tanah organik).

Tanah pada umumnya berpenampang dalam dengan tekstur bervariasi dari halus, sedang sampai kasar. Kesuburan tanah sangat ditentukan oleh bahan pembentuknya. Karena bahan pembentuk tanah di daerah ini berasal dari daerah yang relatif miskin maka tanah yang terbentuk juga mempunyai kandungan hara yang rendah. Daerah rawa belakang jalur aliran sungai dan pelembahan dengan pengendalian air yang baik (terutama saluran pembuangan) dapat dijadikan daerah persawahan (lebak), sedang daerah lainnya, a.l. daerah kipas aluvial/koluvial dengan pemberian air dapat dijadikan areal sawah berpengairan dan daerah perladangan.

Penghambat utama di daerah ini adalah banjir, genangan air dan miskin kandungan hara.

#### **Daerah Marin (B)**

Berupa jalur-jalur beting pasir pantai dan cekungan antar beting (*swales*) yang memanjang sejajar garis pantai. Cekungan ini umumnya tergenang/berawa-rawa. Setempat-setempat jalur

ini terpotong oleh alur-alur pasang surut (tidal creeks) di dataran berlumpur dengan tanahnya yang masih mentah berpotensi sulfat masam. Bentuk lahan datar, datar agak cekung dan datar agak melandai dengan lereng <3% Luas 26.690 ha (1,80%).

Sepanjang beting pantai dijumpai jenis tanah Tropopsammets, yaitu tanah kasar yang belum berkembang. Di daerah pasang surut yang relatif cekung dijumpai jenis tanah Hydraquents yang masih mentah dan selalu tergenang air. Sesetempat dijumpai jenis tanah Sulf-aquents yang berpotensi sulfat tinggi.

Dengan menjaga kelestarian habitat pantai daerah ini dapat dijadikan daerah perikanan/tambak dan dengan pengendalian air yang baik sesetempat dapat digunakan sebagai daerah persawahan, sedang beting pantai untuk tempat pertanaman kelapa.

Penghambat utama daerah ini adalah genangan air laut, kemungkinan keracunan sulfat serta kekeringan di daerah beting pantai.

#### **Grup Teras Marin (T)**

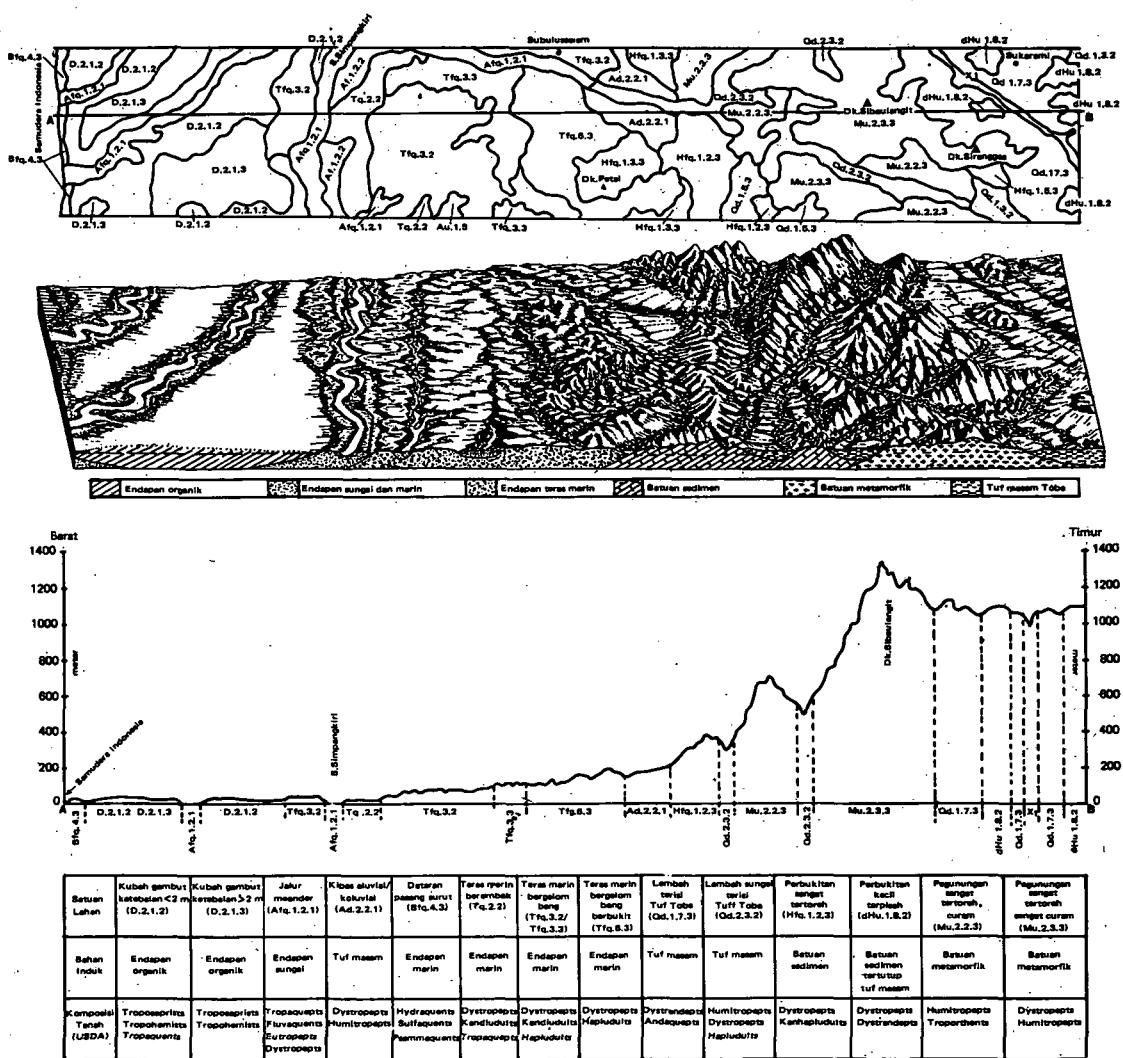
Teras marin terbentuk karena adanya gerakan tektonik yang berakibat pen-gangkatan (uplift) daratan di kawasan tersebut. Daerah peralihan ini tersusun dari bahan yang berasal dari pengikisan batuan di pedalaman yang diendapkan di laut dangkal dan diangkat.

Penyebaran satuan lahan ini antara lain terdapat di sekitar Sabulussalam ke utara dan ke selatan ke arah Singkil Baru, memanjang ke arah Muara Oreh dan Barus.

Bentuk lahan bervariasi antara datar agak berombak, bergelombang sampai berbukit dengan variasi lereng antara 3-25% serta elevasi antara 25 dan 200m. Luas 99.310 ha (6,60%).

Jenis tanah utama yang dijumpai di daerah ini adalah Dystropepts menem-pati daerah-daerah lereng bawah dan puncak perbukitan. Ini merupakan tanah yang relatif muda (tererosi), ber-

**GAMBAR 8 : SATUAN LAHAN, BLOK DIAGRAM DAN PENAMPANG MELINTANG LEMBAR SIDIKALANG**  
**FIGURE 8 : LAND UNITS, BLOCK DIAGRAM AND CROSS-SECTION OF THE SIDIKALANG SHEET**



penampang dalam dengan tekstur bervariasi. Di daerah punggungan dan lereng tengah dijumpai jenis Hapludox dan Kandiudox, merupakan tanah yang tua, berpenampang dalam, dengan tekstur bervariasi. Sedang daerah cekungan dijumpai asosiasi basah dari tanah-tanah tersebut.

Kecuali daerah pelembahan daerah ini tidak cocok untuk pengembangan persawahan. Tanaman semusim dapat dikembangkan di daerah datar sampai berombak.

Dengan memperhatikan segi konservasi daerah berombak, bergelombang sampai agak berbukit dapat digunakan untuk pengembangan tanaman tahunan. Sedang daerah berbukit hendaknya tetap sebagai hutan.

Pembatas utama di daerah ini adalah tanah miskin hara, kekurangan air/kekeringan terutama di musim kemarau serta bahaya erosi terutama di daerah bergelombang sampai berbukit.

#### **Grup Tuf Toba (Q)**

Grup ini menempati wilayah penyebaran yang sangat luas ± 2 juta hektar dan menyebar dari ketinggian 50 sampai 2000m dpl.

Tuf Toba dibagi menjadi a. Daerah Plato (Q.1) dan b. Kaki lereng plato termasuk daerah kipas dan dataran, lembah sungai terisi tuf (Q.2).

##### **a. Daerah Plato Tuf Toba (Q.1).**

Terdapat antara ketinggian 700-2000m dpl. Elevasi tertinggi terletak di daerah D. Toba. Menjauhi Danau Toba ke sebelah barat dan timur, lereng tersebut berangsut menurun.

Daerah ini dipotong oleh sesar/patahan Sumatera memanjang arah tenggara-baratlaut. Sepanjang garis sesar ini dijumpai rangkaian bukit-bukit kecil yang memanjang.

Jenis tanah utama di daerah ini adalah Hydrandepts menempati punggung-punggung datar atau pelembahan luas, sedang di daerah yang melereng dan terpengaruh erosi dijumpai Dystrandepts.

Tanah umumnya berpenampang dalam,

tekstur bervariasi dari halus sampai agak kasar, drainase baik. Di daerah lingkungan basah dijumpai Andaquepts dengan drainase agak terhambat/terhambat

Setempat-setempat dibagian barat daya plato Toba dengan bahan tuf masam yang lebih berpasir, menempati daerah datar agak melandai dengan cekungan-cekungan kecil dijumpai jenis tanah Troporthods dan Tropaquods. Merupakan jenis tanah berpenampang sedang dengan lapisan-lapisan yang mengeras akibat tertumpuknya oksida besi atau bahan organik. Sedang lapisan di atasnya berwarna putih, berkarsa, sebagai sisa pencucian/eluviasi.

##### **b. Kaki lereng plato, kipas dan dataran, lembah sempit terisi tuf (Q.2).**

Daerah ini terletak pada ketinggian dibawah 700m dpl. yang letaknya menyebar. Kaki lereng/foot slopes menyebar di daerah barat laut dan timur laut peta, daerahnya melandai dengan lereng <8%. Daerah dataran dan kipas terdapat di utara Barus dengan ketinggian antara 100-200m dpl berlereng datar agak melandai (lereng 0-3%).

Aliran abu dari Toba mengalir mengikuti lembah-lembah dan mengisi lembah-lembah tersebut. Pelembahan sungai yang terisi ini merupakan pelembahan lebar antar perbukitan/pegunungan yang tersebar di daerah ini. Bentuk wilayahnya datar sampai melandai agak berombak dengan lereng 3-8% .

Jenis tanah utama di lereng plato, kipas dan dataran adalah Dystropepts, sedang di daerah lembah sungai terisi tuf Humitropepts yang relatif lebih kaya. Di daerah punggungan dijumpai juga Hapludults, yang merupakan tanah yang lebih tua, sedang di daerah pelembahan dijumpai Tropaquepts yang merupakan asosiasi basah dari Dystropepts.

Tanah-tanah tersebut berpenampang dalam, tekstur bervariasi halus, sedang sampai kasar.

Daerah plato merupakan daerah yang

sangat potensial bagi pengembangan hortikultura (sayuran dan bunga-bunga) di Sumatera Utara. Sedang daerah lereng plato, kipas dan dataran selain sebagian merupakan daerah pegunungan juga merupakan daerah pengembangan persawahan, tanaman pangan maupun tanaman keras/tahunan. Sebagian daerah plato terutama di sekitar Danau Toba, hendaknya tetap dijaga sebagai hutan lindung guna menjaga keseimbangan air.

Penghambat utama dari jenis-jenis tanah yang berasal dari Toba ini antara lain miskin hara, sangat peka terhadap erosi dan kemungkinan kekurangan air di musim kemarau.

#### **Grup Volkan**

Grup volkan berumur Tersier dan Kuarter membentuk satuan lahan volkanik tua dan muda. Di daerah volkanik tua selain terjadi proses-proses geomorfik (erosi, penorehan dan pendataran) diperlukannya juga terjadi proses tektonik lainnya (pelipatan, pematahan). Akibatnya landscap volkanik tua telah kehilangan bentuk kerucut aslinya dan dikeluarkan dari grup volkan, dimasukkan grup Pegunungan (M), atau Perbukitan (H). Bahan volkanik umumnya dasitik sampai andesitik setempat-setempat basaltik berupa abu, tuf/aglomerat, lahar, lava /batuguling (*boulder*). Penyebaran satuan lahan ini terdapat terpencar, terutama di bagian tengah lembar peta dan di sekitar Danau Toba, antara lain Dolok Simbolon (agak tertoreh), Dk. Pusuk Bukit, Dk. Singgalang, Dk. Sipiso-piso, Dk. Imun, Dk. Sibandang, dan Dk. Sibutan.

Terletak pada ketinggian 900-1800m dpl., lereng curam sampai sangat curam, yaitu >30% (lereng atas dan tengah) dan dengan lereng <16% (lereng bawah). Meliputi luas 13.070 ha (0,85%).

Lereng atas dan tengah volkanik di dominasi oleh jenis tanah Hydrandepts, Troporthents dan Dystrandeps.

Hydrandepts dan Dystrandeps merupakan tanah muda telah mengalami perkem-

bang, berpenampang dalam, bertekstur agak halus sampai sedang, drainase agak cepat. Troporthents merupakan tanah yang belum berkembang, berpenampang dangkal sampai sedang, tekstur kasar, drainase cepat. Hydrandepts dan Dystrandeps mempunyai tingkat kesuburan cukup baik dengan kandungan hara sedang sampai tinggi. Troporthents tingkat kesuburnya rendah.

Lereng bagian bawah didominasi oleh Humitropepts dan Troporthents.

Humitropepts berpenampang dalam, tekstur halus sampai sedang, drainase baik. Tanah ini kaya kandungan bahan organik.

Lereng bawah daerah volkan berpotensi baik sebagai lahan pengembangan hortikultura dan tanaman tahunan/keras dataran tinggi. Lereng tengah dan atas hendaknya tetap sebagai hutan lindung. Penghambat utama di daerah ini a.l: tanah peka terhadap erosi sehingga perlakuan konservasi tanah sangat perlu diperhatikan, lereng sangat terjal dan kemungkinan kekurangan air.

#### **Grup Karst (K)**

Letak grup ini menyebar di sebelah tenggara dan barat laut lembah peta dengan bentuk wilayah berbukit sampai bergelombang. Permukaannya mempunyai morfologi yang tidak tertutup. Batukapur yang lebih resisten/kukuh muncul di permukaan sebagai singkapan dengan dinding yang sangat curam, lembah-lembah yang sempit dan dalam. Dijumpai pula guha-guha yang cukup dalam.

Grup karst di daerah ini terletak pada ketinggian 300-1500m dpl. Daerahnya sangat tertoreh dengan dengan variasi lereng antara 15-30% (untuk daerah perbukitan), dan >75% untuk daerah pegunungan. Meliputi luas ± 17.315 ha (1.15%).

Jenis tanah utama di daerah ini adalah Hapludalfs yang menempati punggung-punggung di antara batukapur dan Dystropepts yang menempati kaki lereng batukapur.

Tanah berpenampang sedang sampai

dangkal, tekstur halus, drainase baik. Kesuburan tanah rendah sampai sedang.

Kecuali batukapurnya yang dapat diniagakan, daerah ini tidak mempunyai potensi untuk pengembangan pertanian, kecuali skala kecil di lereng-lereng bawah yang landai sebagai perladangan. Daerah yang terbuka diantara batuan disarankan untuk dihutankan.

#### **Grup Perbukitan (H)**

Grup perbukitan terbentuk karena gaya tektonik (dari dalam) dan proses geomorfik dipermukaannya yang menghasilkan morfologi/ relief tak beraturan. Variasi litologi menentukan pula ketidakteraturan tersebut. Penyebarannya terutama di lereng bawah bagian barat dan tengah pegunungan Barisan, menyebar ke utara dan selatan dengan bentukan lungur membulat/memanjang, disamping bentukan-bentukan khusus seperti di Pulau Samosir dan bukit-bukit memanjang di sekitar patahan Sumatera. Di bagian tengah terdapat bukit-bukit kecil terpisah satu dengan lainnya dan umumnya tertutup oleh tuf Toba.

Pulau Samosir mempunyai bentukkan yang khusus baik relief maupun litologinya. Bentuk wilayah berbukit sampai berbukit agak bergunung dengan variasi lereng antara 8 dan >30%. Meliputi luas 150.000 ha (12,35%).

Jenis tanah utama di daerah perbukitan di luar Pulau Samosir adalah Dystropepts yang terutama terdapat di lereng-lereng atas dan bawah punggung perbukitan, sedang di lereng tengah dijumpai jenis Hapludults dan Kanhapludults.

Tanah berpenampang sedang sampai dalam, tekstur bervariasi halus, sedang sampai kasar, drainase baik, miskin hara tanaman.

Jenis tanah utama Pulau Samosir adalah Eutropepts, mempunyai kadar hara lebih baik dibanding Dystropepts. Menempati lereng bawah dan tengah, sedang lereng atas ditempati Dystropepts.

Daerah perbukitan dengan lereng 15-30%

berpotensi cukup baik untuk pengembangan tanaman tahunan dalam skala kecil dengan memperhatikan konservasi tanah. Daerah dengan lereng >30% hindaknya tetap sebagai hutan lindung, sedang lereng dibawah 15% dapat digunakan sebagai areal pengembangan tanaman semusim. Sebagian wilayah P. Samosir dapat digunakan untuk pengembangan peternakan.

Penghambat utama daerah ini antara lain: tanah miskin hara tanaman, sebagian lereng curam, bahaya erosi serta kekeringan terutama di P. Samosir.

#### **Grup Pegunungan (M)**

Grup ini terletak antara ketinggian 200 - 2.000m dpl, berlereng curam, sampai sangat curam sekali dengan lereng diantara 30 - 75% dan lebih dari 75%. Bagian tertinggi dari P. Samosir merupakan suatu plato, berlereng melandai, lereng 3-8% terletak diantara ketinggian 1500-1700m dpl.

Jenis tanah utama di daerah ini adalah Dystropepts yang menempati puncak-puncak sempit dan runcing dan juga lereng atas, Humitropepts menempati lereng-lereng bawah dan pelembahan, sedangkan Troorthents dan Tropopsaments yang berpenampang dangkal/sedang, terdapat di kaki-kaki lereng.

Tanah berpenampang sedang sampai dalam sedang yang berasal dari bahan volkan berpenampang sangat dalam dengan warna yang lebih gelap dan lebih kaya unsur hara. Tekstur tanah bervariasi; drainase pada umumnya baik. Kecuali tanah yang berasal dari volkan, maka tanah-tanah di daerah ini mempunyai tingkat kesuburan rendah.

Puncak Pulau Samosir yang relatif datar/landai ditempati oleh Humitropepts sedang tanah daerah berlereng ditempati Eutropepts. Jenis tanah ini mempunyai tingkat kesuburan lebih baik dibanding ditempat lainnya.

Daerah pegunungan tidak mempunyai potensi untuk pengembangan kegiatan pertanian/perkebunan. Penghutanannya kem-

bali daerah-daerah yang telah rusak akan sangat bermanfaat terhadap tatanan air di daerah bawahnya, di samping akan mengurangi bahaya perusakan oleh erosi. Penghambat utama di daerah ini adalah lereng yang sangat curam/sangat curam sekali, bahaya erosi kekeringan dan daerahnya sukar sekali dijangkau (tidak ada sarana jalan).

#### Grup Aneka Bentuk (X)

Grup ini merupakan bentukan tersendiri di luar satuan lahan yang telah diuraikan. Bentukan ini bukan satuan lahan/satuan peta, tapi merupakan bentukan yang spesifik. Dijumpai antara lain X1 untuk lembah sungai terjal tererosi atau lereng tunggal terjal, X2 untuk daerah kota/pemukiman, X3 untuk danau.

#### 5.2. Isi uraian satuan lahan

Uraian satuan lahan merupakan pokok terpenting dalam buku penjelasan ini. Disajikan uraian dari 66 satuan lahan yang terdapat pada lembar peta 0618 (Sidikalang), secara detail dan dalam bentuk/format yang baku.

Agar memudahkan untuk para pemakai, maka setiap Satuan Lahan yang diketemukan pada lembar peta ini diuraikan secara mendetil pada Lampiran 1.

Uraian itu antara lain meliputi :

- Luas dan penyebarannya pada tiap Provinsi yang diliput.
- Citra satelit, foto udara dan Radar yang meliput Satuan Lahan tsb.
- Bahan induk yang meliputi tingkat pelapukannya, litologinya dan formasi menurut peta Geologi.
- Sumber dan kualitas air
- Kemungkinan perikanan
- Bahaya banjir atau genangan
- Vegetasi dan penggunaan lahan
- Tingkat bahaya erosi (yang dipercepat)
- Satuan Tanah yang dijumpai (pada tingkat Great Grup)
- Sifat-sifat kimia dan morfologi penting dari tanah lapisan atas
- Ketinggian dari muka laut
- Bentuk profil Satuan Lahan tsb.

- Pola drainase
- Lereng
- Distribusi lereng pada Satuan Lahan tsb
- Perbedaan tinggi
- Bentuk wilayah
- Keadaan pelembahannya
- Pembagian lanjut dari Satuan Lahan (Faset)
- Fragmentasi lahan yang bisa diusahakan untuk pertanian, dan
- Tingkat relabilitas dari unsur unsur diatas

Disamping itu disajikan pula penampang melintang dari tiap Satuan Lahan tersebut untuk memudahkan pemakai membayangkan keadaan Satuan Lahan tersebut.

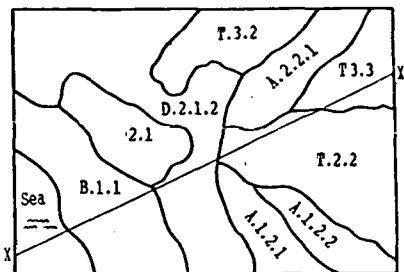
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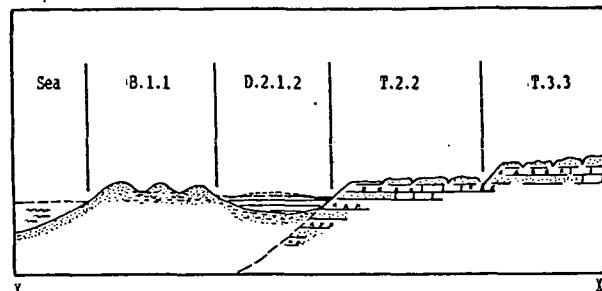
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LAMPIRAN 1. URAIAN SATUAN LAHAN  
APPENDIX 1. LAND UNIT DESCRIPTIONS

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: D.2.1.2      2. MAP SHEET: 0618      3. AREA: 852 km<sup>2</sup>  
 4. OCCURRENCE by PROVINCE: DI Aceh: 93%, Sumatera Utara: 7%  
 5. STATUS IDENTIFIERS : Updated by: DR      edit date: 20/03/89      Status: Final  
 6. LAND UNIT DESCRIPTION: Fresh water peat domes; organic sediment thickness 0,5 - 2m  
 7. SATELLITE SCENES : 129/59/26/06/85, 129/58/26/06/85  
 8. AERIAL PHOTOGRAPHS : 1:100.000 10B / -36, 9B / -48, 10C / -56  
 9. RADAR : Star-I/250/88/618-1234  
 10. PARENT MATERIAL.  
     a. Weathering : Partial  
     b. Lithology : peat, clay  
     c. Formation : Qh  
 11. ROCK OUTCROP: %  
 12. WATER      a. Quality : Not known  
     b. Source : Rain  
 13. FISHERIES : Tambak (estuary)  
 14. RIVERS a. Floodrisk : Low  
     b. Imundation: Permanent  
 15. VEGETATION/LAND USE : peat swamp forest (gambut), swamp (rawa) including sedges, rainfed wetland rice  
     Area used : 10 %  
 16. ACCELERATED EROSION  
     a. Occurrence : None  
     b. Evidence :

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	troposaprist	50 %	yes
Associated 1	tropohemists	40 %	yes
Associated 2	tropaquepts	10 %	yes

## 32. REPRESENTATIVE PROFILES:

hat/ / /87/mk/0618/14/ /07 /	het/ / /87/as/0618/12/ /15 /
iqt/ / /87/D/0618/43/ /16 /	/ / / /0618/ / / /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	organic	organic	moderately fine
subsoil	organic	organic	moderately fine
b. Depth: peatsoil	very deep	extremely deep	--
mineralsoil	--	--	very deep
c. Drainage:	Very poorly drained	Very poorly drained	Poorly drained
d. Exch. K:	topsoil very low	medium	low
subsoil	very low	medium	very low
e. Total K2O:	topsoil medium	very low	low
subsoil	very low	very low	very low
f. Avail. P:	method Bray I	Bray I	Bray I
topsoil very high	very low	very low	very low
subsoil	very low	very low	very low
g. Total P:	topsoil medium	very low	low
subsoil	very low	very low	medium
h. CEC pH 7	topsoil very low	very high	high
subsoil	very high	very high	low
i. Soil Reaction:	topsoil excessive acid	very strong acid	very strong acid
subsoil	excessive acid	very strong acid	very strong acid
j. Al Sat.	topsoil --	very low	very low
subsoil	medium	medium	low
k. Al toxicity :	no	no	--
l. Acid sulph. pot.:	very deep	very deep	very deep
m. Salinity :	salt free	--	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	340 cm	120 cm
p. Organic Matter :	71.0	43.8	12.5
q. TEB :	1.5	3.5	4.2
r. Total observations:	1	1	1

19. ALTITUDE: Maximum: 5 m Minimum: 1 m Range: 3 m

20. PLAN/PROFILE: Dominant: No pronounced highs/lows

Included:

21. L.U. DRAINAGE: a. Pattern: centripetal b. density: Very low

c. Variability: low

22. SLOPE: a. Steepness: flat b. Variability: Low

c. Length:

d. Variability:

e. Curvature: straight

23. SLOPE DISTR.: Valleybottoms: 100 %

Interfluves : 0-8%: 0 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:

d. Width:

e. Variability:

27. VALLEY FLOOR: a. Width: b. Variability:

28. LAND FACETS: -1- Domes, troposaprists, 50%

-2- Domes, tropohemists, 40%

-3- Domes, tropaquepts, 10%

-4-

29. FRAGMENTATION: Valleys: Interfluves:

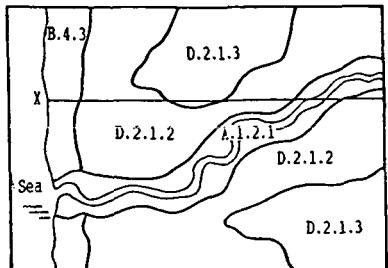
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 2 14.b: 2 17: 1 18.a: 1 18.b: 2 18.c: 1

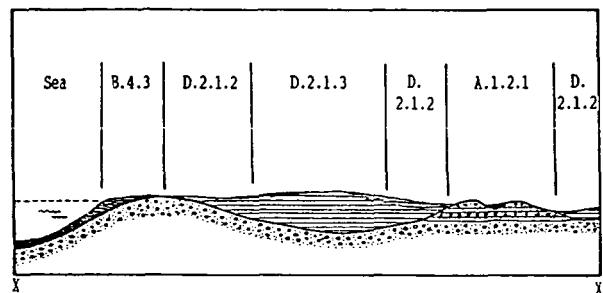
18.d-q: 2 19: 2 22: 1 23: 2 24: 1 28: 2 29:

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: D.2.1.3      2. MAP SHEET: 0618      3. AREA: 346 km<sup>2</sup>  
 4. OCCURENCE by PROVINCE: DI Aceh: 96%, Sumatera Utara: 4%  
 5. STATUS IDENTIFIERS : Updated by: DR      edit date: 20/05/89      Status: Final  
 6. LAND UNIT DESCRIPTION: Fresh water peat domes, organic sediment thickness >2m, flat to slightly convex.  
 7. SATELLITE SCENES : 129/59/26/06/85, 129/58/26/06/85  
 8. AERIAL PHOTOGRAPHS : 1:100.000 10B / -036, 9B / -048. 10C / -056  
 9. RADAR : STAR-I/250/88/0618-4  
 10. PARENT MATERIAL.  
     a. Weathering : Partial  
     b. Lithology : peat  
     c. Formation : Qh  
 11. ROCK OUTCROP: 0 %  
 12. WATER a. Quality : Fresh  
     b. Source : Rain  
 13. FISHERIES : Rawa (swamp)  
 14. RIVERS a. Floodrisk : Low  
     b. Imundation: Permanent  
 15. VEGETATION/LAND USE : peat swamp forest (gambut), swamp (rawa) including sedges  
     Area used : 0 %  
 16. ACCELERATED EROSION  
     a. Occurrence : None  
     b. Evidence :

17. SOIL GREAT GROUP :	Classification	% of area	Lab. checked
Dominant >50%	troposaprists	70 %	yes
Associated 1	tropohemists	30 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

hat/ / 87/MK/0618/14/ /1 / het/ / /87/AS/0618/12/ /15 /

## **18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
<b>a. Texture:</b>	<b>topsoil</b> organic	organic	organic
	<b>subsoil</b> organic	organic	organic
<b>b. Depth:</b>	<b>peatsoil</b> extremely deep	extremely deep	extremely deep
	<b>mineralsoil</b> --	--	--
<b>c. Drainage:</b>	Very poorly drained	Very poorly drained	Very poorly drained
<b>d. Exch. K:</b>	<b>topsoil</b> high	medium	high
	<b>subsoil</b> high	medium	high
<b>e. Total K2O:</b>	<b>topsoil</b> high	very low	--
	<b>subsoil</b> medium	very low	--
<b>f. Avail. P:</b>	<b>method</b> Bray I	Bray I	.
	<b>topsoil</b> very high	very low	low
	<b>subsoil</b> very low	very low	low
<b>g. Total P:</b>	<b>topsoil</b> medium	very low	very low
	<b>subsoil</b> high	very low	very low
<b>h. CEC pH 7</b>	<b>topsoil</b> very high	very high	very high
	<b>subsoil</b> very high	very high	very high
<b>i. Soil Reaction:</b>	<b>topsoil</b> excessive acid	very strong acid	very strong acid
	<b>subsoil</b> excessive acid	very strong acid	very strong acid
<b>j. Al Sat.</b>	<b>topsoil</b> very low	very low	low
	<b>subsoil</b> low	medium	low
<b>k. Al toxicity :</b>	--	no	--
<b>l. Acid sulph. pot.:</b>	very deep	very deep	--
<b>m. Salinity :</b>	--	--	--
<b>n. Other Toxicity:</b>	--	--	--
<b>o. Root obstr. layer :</b>	--	--	--
<b>p. Organic Matter :</b>	85.3	43.8	0.0
<b>q. TEB :</b>	15.4	3.5	0.0
<b>r. Total observations:</b>	1	1	1

**19. ALTITUDE:** Maximum: 10 m Minimum: 1 m Range: 5 m

**20. PLAN/PROFILE:** Dominant: No pronounced highs/lows

### **Included:**

**21. L.U. DRAINAGE:** a. Pattern: deranged  
c. Variability: low

b. density: Very low

**22. SLOPE:**      a. *Steepness: flat*  
                          c. *Length:*  
                          e. *Curvature: straight*

- b. Variability: Low
- d. Variability:

**23. SLOPE DISTR.: Valleybottoms: 100 %  
Interfluvium: 0-87-0 % 9-25%: 0 % 25-55%: 0 %**

**24 RELIEF AMPLITUDE** - Amplitude very low.

25. TERRAIN: Flat slope (3%) 0-50 m.

**26. CREST/RIDGES:** a. Shape: no crests      b. Length: 1. Width: 2. Height: 3. Slope: <24°, 0-30 m

d. Width: e. Variability: f. Height:

27. VALLEY FLOOR: a. Width: b. Variability:

**28. LAND FACETS:** -1- Domes, troposaprist, /0

-2- Domes, tropohemists, 30%

-3-

-4-

**29. FRAGMENTATION:** Valleys: Interfluvia

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**30. RELIABILITY:**  $1 - \alpha$

**10.b : 2    12.a: 2    14**

**18.d-q:** 2      **19:** 2      **22:** 2      **23:** 2      **24:** 2

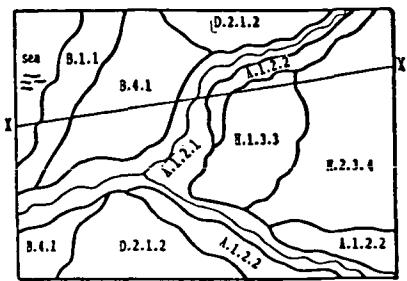
**30 RELIABILITY:** 1= reliable 2= probable 3= tenable 4= plausible

**18 b**  $\pm$  **2**   **12 a**  $\pm$  **2**   **14 a**  $\pm$  **2**   **14 b**  $\pm$  **2**   **12**  $\pm$  **1**   **18 a**  $\pm$  **1**   **18 b**  $\pm$  **2**   **18 a**  $\pm$  **1**

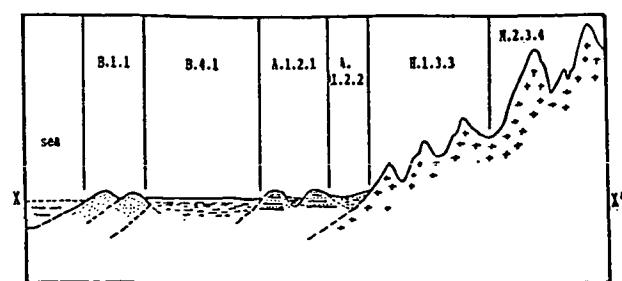
**18-4m**: 2    **18-**: 2    **22-**: 2    **23-**: 2    **24-**: 2    **28-**: 2    **29-**

### 31 ADDITIONAL NOTES.

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Afq.1.2.1      2. MAP SHEET: 0618      3. AREA: 441 km<sup>2</sup>
4. OCCURENCE by PROVINCE: DI Aceh: 92%, Sumatera Utara: 8%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 06/05/89      Status: Final
6. LAND UNIT DESCRIPTION: Meander belts of broad alluvial valleys, fine and coarse sediments, slopes 0-3%.
7. SATELLITE SCENES : 129/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 11F / -45 , 10C / -36 , 10B / -016
9. RADAR : STAR-I/250/88/0618-234
10. PARPET MATERIAL      11. ROCK OUTCROP: 0 %
- a. Weathering : Slight
  - b. Lithology : clay, sand
  - c. Formation : Qh
12. WATER a. Quality : Fresh  
b. Source : Rain, Perennial River
13. FISHERIES : Sungai (river)
14. RIVERS a. Floodrisk : Medium  
b. Immddation: Seasonal
15. VEGETATION/LAND USE : moist primary lowland forest, bush, swamp (rawa) including sedges, upland crops, towns, villages  
Area used : 50 %
16. ACCELERATED EROSION
- a. Occurrence : None
  - b. Evidence :
17. SOIL GREAT GROUP :
- |               | Classification | % of area | Lab. checked |
|---------------|----------------|-----------|--------------|
| Dominant >50% | tropaquepts    | 60 %      | yes          |
| Associated 1  | dystropepts    | 30 %      | yes          |
| Associated 2  | fluvaquents    | 10 %      | yes          |
32. REPRESENTATIVE PROFILES:
- | igt/ite/ | / | /87/AH/0618/44/ /87/D/0618/42/ | /19 / /1 / | ity/eqv/17 | / | /87/AS/0618/14/ /17-4 | /14 / /82/AH/0618/42/ /1 / |
|----------|---|--------------------------------|------------|------------|---|-----------------------|----------------------------|
|----------|---|--------------------------------|------------|------------|---|-----------------------|----------------------------|

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	moderately coarse medium	moderately fine moderately fine
b. Depth:	peatsoil -- mineralsoil very deep	deep	deep
c. Drainage:	Poorly drained	Moderately well	Poorly drained
d. Exch. K:	topsoil medium subsoil medium	very low very low	very low very low
e. Total K2O:	topsoil medium subsoil medium	very high very high	very low very low
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	Bray I very low very low
g. Total P:	topsoil medium subsoil medium	low low	very low very low
h. CEC pH 7	topsoil high subsoil high	low low	very low very low
i. Soil Reaction:	topsoil moderately acid subsoil moderately acid	very strong acid strong acid	strong acid strong acid
j. Al Sat.	topsoil very low subsoil very low	low low	very low very low
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	130 cm	110 cm	120 cm
p. Organic Matter :	0.9	1.5	1.6
q. TEB :	0.5	2.1	10.7
r. Total observations:	2	4	1

19. ALTITUDE: Maximum: 50 m Minimum: 5 m Range: 25 m

20. PLAN/PROFILE: Dominant: No pronounced highs/lows

Included:

21. L.U. DRAINAGE: a. Pattern: meandering b. density: Very low

c. Variability: low

22. SLOPE: a. Steepness: flat b. Variability: Low

c. Length:

d. Variability:

e. Curvature:

23. SLOPE DISTR.: Valleybottoms: 70 %

Interfluves : 0-8%:30 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: b. Length: c. Variability:

d. Width:

e. Variability:

27. VALLEY FLOOR: a. Width: wide b. Variability:

28. LAND FACETS: -1- Depression &amp;oxbow lake, tropaquepts, 60%

-2- Spillways and levees, dystropepts, 30%

-3- Along river bed, fluvaquents, 10%

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Small blocks

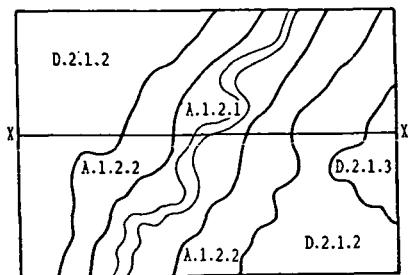
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 2 14.b: 2 17: 1 18.a: 1 18.b: 1 18.c: 1

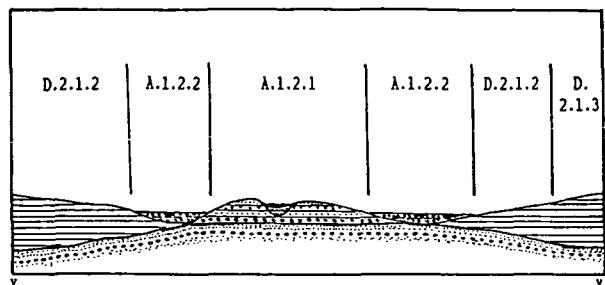
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 2 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Af.1.2.2

2. MAP SHEET: 0618

3. AREA: 146 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: DI Aceh: 89%, Sumatera Utara: 11%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 06/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Backswamps of broad alluvial valleys, fine sediments, slopes 0-3%.

7. SATELLITE SCENES : 129/58/08/08/85, 129/59/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 10B / -16 , 10C / -054,

9. RADAR : STAR-I/250/88/0618-2,4

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

a. Weathering : Slight

b. Lithology : clay, peat

c. Formation : Qh

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : Rawa (swamp)

14. RIVERS a. Floodrisk : Medium

b. Immndation: Permanent

15. VEGETATION/LAND USE : peat swamp forest (gambut), swamp forest (rawa), grazing land, rainfed wetland rice

Area used : 40 %

## 16. ACCELERATED EROSION

a. Occurrence :

b. Evidence :

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	tropaqueents	70 %	yes
Associated 1	tropohemists	20 %	yes
Associated 2	psammaquents	10 %	yes

## 32. REPRESENTATIVE PROFILES:

eqt/	/300-5	/84/d1/0618/42/	/002/	iqt/	/	/87/ah/0618/44/	/012/
hat/	/17-2	/82/ba/0618/42/	/006/	het/	/17-1	/82/ba/0618/42/	/003/
eqs/	/	/87/tb/0618/22/	/055/				

#### 18. SOIL CHARACTERISTICS

Properties	Dominant > 50%	Associated 1	Associated 2
a. Texture:	topsoil medium subsoil moderately fine	organic organic	coarse coarse
b. Depth:	peatsoil -- mineralsoil deep	extremely deep --	-- very deep
c. Drainage:	Poorly drained	Very poorly drained	Poorly drained
d. Exch. K:	topsoil very high subsoil very high	very high high	very low very low
e. Total K2O:	topsoil very low subsoil very low	high medium	very low very low
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I medium low	Bray I very low very low
g. Total P:	topsoil very low subsoil very low	very high very high	very low very low
h. CEC pH 7	topsoil very low subsoil very low	very high very high	very low very low
i. Soil Reaction:	topsoil very strong acid subsoil slightly acid	excessive acid excessive acid	moderately acid strong acid
j. Al Sat.	topsoil very low subsoil very low	high very high	low medium
k. Al toxicity :	--	no	no
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	80 cm	120 cm	125 cm
p. Organic Matter :	2.1	10.7	2.1
q. TEB :	18.7	3.6	1.0
r. Total observations:	1	1	1

19. ALTITUDE: Maximum: 50 m Minimum: 5 m Range: 20 m

20. PLAN/PROFILE: Dominant: No pronounced highs/lows

Included:

21. L.U. DRAINAGE: a. Pattern: meandering b. density: Very low  
c. Variability:

22. SLOPE: a. Steepness: flat b. Variability: Low  
c. Length:  
e. Curvature: concave

23. SLOPE DISTR.: Valleybottoms: 90 %

Interfluves : 0-8%:10 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope <2%, 0-50 m

26. CREST/RIDGES: a. Shape: b. Length: c. Variability:  
d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: b. Variability:

28. LAND FACETS: -1- Backswamps, tropaqueents, 70%  
-2- Backswamps, tropohemists, 20%  
-3- Transition, psammaquents, 10%  
-4-

29. FRAGMENTATION: Valleys: Interfluves:

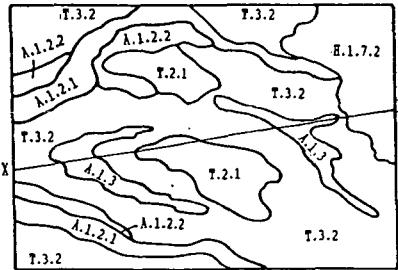
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 2 14.b: 2 17: 1 18.a: 1 18.b: 2 18.c: 1

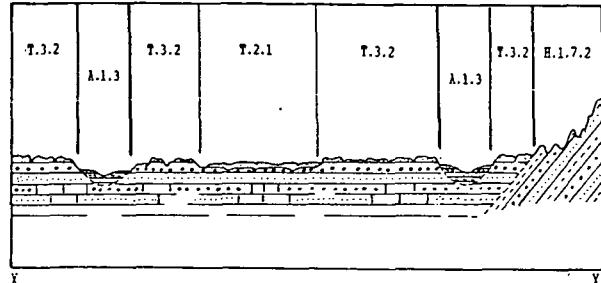
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 2 29:

31. ADDITIONAL NOTES: In some transitions to the levees one may find Psammaquents

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Au.1.3

2. MAP SHEET: 0618

3. AREA: 44 km<sup>2</sup>

4. OCCURENCE by PROVINCE: DI Aceh: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 20/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Narrow valley bottoms, mixed sediments, slopes 0-3%.

7. SATELLITE SCENES : 129/59/26/06/85

8. AERIAL PHOTOGRAPHS : 1:100.000 10B / -016, 9B / -048

9. RADAR : STAR-I/250/88/0618-3,4

10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

a. Weathering : Slight

b. Lithology : sand, clay, gravel

c. Formation : Qh

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : Rawa (swamp)

14. RIVERS a. Floodrisk : Low

b. Imundation: Seasonal

15. VEGETATION/LAND USE : , swamp (rawa) including sedges, irrigated wetland rice (irigasi)

Area used : 50 %

16. ACCELERATED EROSION

a. Occurrence : None

b. Evidence :

17. SOIL GREAT GROUP

	Classification	% of area	Lab. checked
Dominant >50%	tropaquepts	90 %	yes
Associated 1	tropopsammments	10 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

iqt/ / 87/ah/0618/44/ /012/ est/ /300-4 /84/cb/0618/42/ /004/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	medium	coarse	--
subsoil	moderately fine	moderately coarse	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	moderately deep	--
c. Drainage:	Poorly drained	Excessively drained	--
d. Exch. K:	topsoil low	very high	--
subsoil low	very high	--	--
e. Total K2O:	topsoil medium	very low	--
subsoil medium	very low	--	--
f. Avail. P:	method Bray I	Bray I	
topsoil very low	very low	--	--
subsoil very low	very low	--	--
g. Total P:	topsoil low	low	--
subsoil medium	medium	--	--
h. CEC pH 7	topsoil high	very low	--
subsoil high	very low	--	--
i. Soil Reaction: topsoil	very strong acid	very strong acid	--
subsoil	very strong acid	slightly acid	--
j. Al Sat.	topsoil low	very low	--
subsoil low	very low	--	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	--	--
p. Organic Matter :	4.9	0.6	0.0
q. TEB :	8.8	13.3	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 75 m Minimum: 50 m Range: 50 m

20. PLAN/PROFILE: Dominant: No pronounced highs/lows

Included:

21. L.U. DRAINAGE: a. Pattern: meandering

b. density:

c. Variability: low

22. SLOPE: a. Steepness: flat

b. Variability: Low

c. Length:

d. Variability:

e. Curvature:

23. SLOPE DISTR.: Valleybottoms: 90 %

Interfluves : 0-8%:10 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low

b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests

b. Length:

c. Variability:

d. Width:

e. Variability:

27. VALLEY FLOOR: a. Width: wide

b. Variability: Low

28. LAND FACETS: -1- Valley bottom, tropaquepts, 90%

-2- Transition, tropksamments, 10%

-3-

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Small blocks

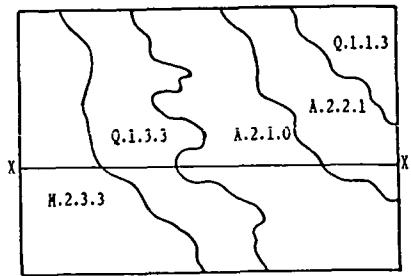
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 2 14.b: 2 17: 2 18.a: 1 18.b: 1 18.c: 1

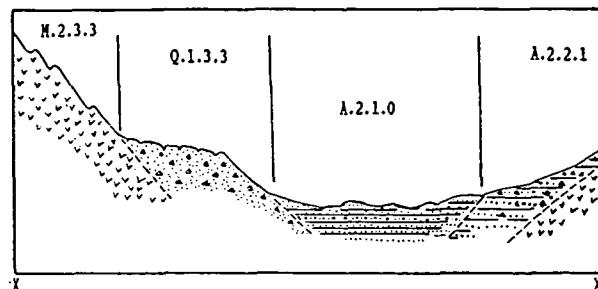
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 2 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Aq.2.1.0      2. MAP SHEET: 0618      3. AREA: 22 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 20/03/89      Status: Final
6. LAND UNIT DESCRIPTION: Not dissected accumulation valleys bottom, coarse sediments, slopes 0-5%.
7. SATELLITE SCENES : 1 /2 /09/05/85, 0 /08/09/05/85
8. AERIAL PHOTOGRAPHS : 1:100.000 T02 /8323-159,
9. RADAR : STAR-I/250/88/0618-1
10. PARENT MATERIAL      11. ROCK OUTCROP: %
- a. Weathering : Slight
  - b. Lithology : sand
  - c. Formation : Qh
12. WATER a. Quality : Fresh  
b. Source : Perennial River, Medium wells
13. FISHERIES : Sungai (river)
14. RIVERS a. Floodrisk : Low  
b. Inundation: None
15. VEGETATION/LAND USE : , horticultural crops, irrigated wetland rice (irigasi), towns, villages  
Area used : 100 %
16. ACCELERATED EROSION
- a. Occurrence :
  - b. Evidence :
- 
17. SOIL GREAT GROUP :
- |               | Classification | % of area | Lab. checked |
|---------------|----------------|-----------|--------------|
| Dominant >50% | fluvaquents    | 65 %      | no           |
| Associated 1  | tropaquents    | 35 %      | no           |
| Associated 2  |                |           |              |
- 
32. REPRESENTATIVE PROFILES:
- eqv/ / 87/jh/0618/32/ /054/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately fine	--	fine
subsoil	fine	--	fine
b. Depth: peatsoil	--	--	Shallow
mineralsoil	very deep	--	very deep
c. Drainage:	Poorly drained	--	Poorly drained
d. Exch. K:	topsoil --	--	medium
subsoil	--	--	low
e. Total K2O:	topsoil --	--	--
subsoil	--	--	--
f. Avail. P:	method		Bray I
topsoil	--	--	very low
subsoil	--	--	very high
g. Total P:	topsoil --	--	--
subsoil	--	--	--
h. CEC pH 7	topsoil --	--	very high
subsoil	--	--	very high
i. Soil Reaction:	topsoil --	--	neutral
subsoil	--	--	very strong acid
j. Al Sat.	topsoil --	--	--
subsoil	--	--	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	--	--
p. Organic Matter :	0.0	0.0	0.0
q. TEB :	0.0	0.0	0.0
r. Total observations:	1	0	1

19. ALTITUDE: Maximum: 950 m Minimum: 825 m Range: 900 m

20. PLAN/PROFILE: Dominant: No pronounced highs/lows

Included:

21. L.U. DRAINAGE: a. Pattern: distributary b. density: Very low

c. Variability: low

22. SLOPE: a. Steepness: flat b. Variability: Low

c. Length: long

d. Variability: Low

e. Curvature: concave

23. SLOPE DISTR.: Valleybottoms: 100 %

Interfluves : 0-8%: 0 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:

d. Width:

e. Variability:

27. VALLEY FLOOR: a. Width: moderate b. Variability: Low

28. LAND FACETS: -1- Valley bottoms, fluvaquents, 65%

-2- Valley bottoms, tropaqueents, 35%

-3-

-4-

29. FRAGMENTATION: Valleys: Medium blocks Interfluves:

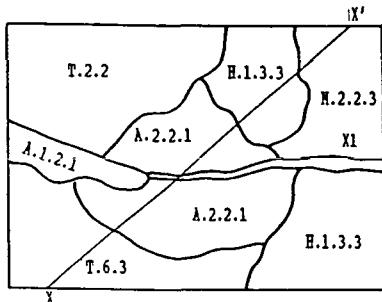
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

18.b : 1 12.a: 1 14.a: 2 14.b: 2 17: 2 18.a: 2 18.b: 2 18.c: 1

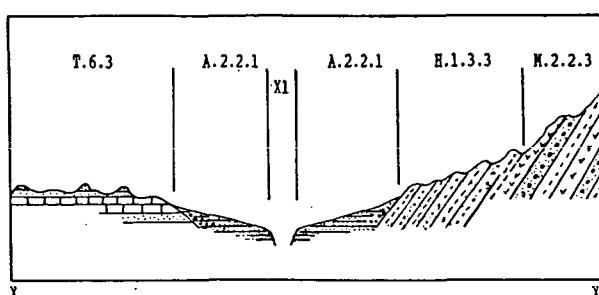
18.d-q: 2 19: 2 22: 1 23: 1 24: 2 28: 1 29: 2

31. ADDITIONAL NOTES: Typical for "graben" .

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Aq.2.2.1

2. MAP SHEET: 0618

3. AREA: 126 km<sup>2</sup>

4. OCCURENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 20/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Slightly dissected alluvial and colluvial fans, coarse sediments, slopes 0-5%.

7. SATELLITE SCENES : 128/58/08/08/85, 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 145 /8347-089, 145 /8319-113, 115 /8323-105

9. RADAR : STAR-I/250/88/0618-345

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 5 %

a. Weathering : Slight

b. Lithology : sand, gravel

c. Formation : Qh

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : Danau (lake)

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , upland crops, irrigated wetland rice (irigasi), rainfed wetland rice, towns, villages

Area used : 90 %

## 16. ACCELERATED EROSION

a. Occurrence : Common

b. Evidence : Landslips

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	tropaquepts	65 %	yes
Associated 1	fluvaquents	25 %	yes
Associated 2	tropopsamments	10 %	yes

## 32. REPRESENTATIVE PROFILES:

iqt/	/301-21	/69/p	/0618/63/	/021/	est/	/	/63/lh/0618/63/	/013/
eqv/	/							

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil moderately coarse subsoil moderately coarse	coarse moderately fine	moderately coarse coarse
b. Depth:	peatsoil -- mineralsoil moderately deep	-- moderately deep	-- very deep
c. Drainage:	Poorly drained	Moderately well	Imperfectly drained
d. Exch. K:	topsoil very high subsoil very high	low medium	medium
e. Total K2O:	topsoil very low subsoil very low	very high very high	very high
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very high high	Bray I very high very high
g. Total P:	topsoil very low subsoil very low	high low	very high medium
h. CEC pH 7	topsoil very low subsoil very low	very low very low	low very low
i. Soil Reaction:	topsoil slightly acid subsoil slightly acid	excessive acid very strong acid	strong acid moderately acid
j. Al Sat.	topsoil very low subsoil very low	very low very low	very low very low
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	60 cm	62 cm	130 cm
p. Organic Matter :	0.8	0.5	1.5
q. TEB :	7.2	3.3	2.7
r. Total observations:	1	1	1

19. ALTITUDE: Maximum: 950 m Minimum: 900 m Range: 925 m

20. PLAN/PROFILE: Dominant: No pronounced highs/lows

Included:

21. L.U. DRAINAGE: a. Pattern: distributary b. density: Low

c. Variability: low

22. SLOPE: a. Steepness: gently sloping b. Variability: Low

c. Length: long d. Variability: Low

e. Curvature: straight

23. SLOPE DISTR.: Valleybottoms: 100 %

Interfluves : 0-8%: 0 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: b. Length: c. Variability:

d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Mid fans, tropaquepts, 65%

-2- Concave lower part, fluvaquents, 25%

-3- Fan head, tropopsammets, 10%

-4-

29. FRAGMENTATION: Valleys: Interfluves:

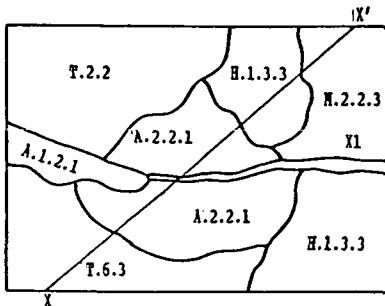
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 2 14.b: 2 17: 3 18.a: 1 18.b: 2 18.c: 2

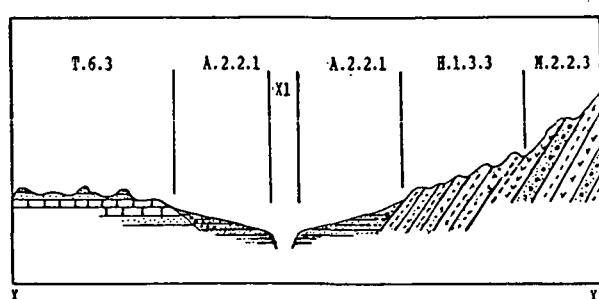
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 2 29:

31. ADDITIONAL NOTES: Locally stony.

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Afq.2.2.1

2. MAP SHEET: 0618

3. AREA: 71 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: DI Aceh: 53%, Sumatera Utara: 47%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 30/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Slightly dissected alluvial and colluvial fans, fine and coarse sedimentary, slopes 6-5%.

7. SATELLITE SCENES : 128/58/08/08/85, 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 10c / -040,

9. RADAR : STAR-I/250/88/0618-1,6

10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

- a. Weathering : Slight
- b. Lithology : sand, clay
- c. Formation : Qh

12. WATER a. Quality : Fresh

b. Source : Rain, Shallow wells

13. FISHERIES : Sungai (river)

14. RIVERS a. Floodrisk : Low

b. Imundation: None

15. VEGETATION/LAND USE : , bush, upland crops, irrigated wetland rice (irigasi), rainfed wetland rice

Area used : 80 %

16. ACCELERATED EROSION

- a. Occurrence : Localised
- b. Evidence : Landslips

17. SOIL GREAT GROUP :

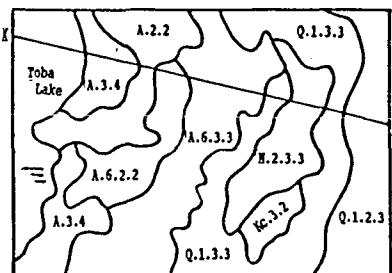
	Classification	% of area	Lab. checked
Dominant >50%	fluvaquents	70 %	yes
Associated 1	psammaquents	30 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

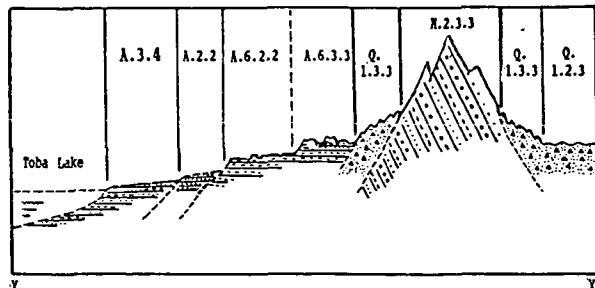
eqv/ / 87/JH/0618/22/ /70 / eqs/ / 87/MD/0618/21/ /36 /



## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Ad.2.2.1      2. MAP SHEET: 0618      3. AREA: 109 km<sup>2</sup>
4. OCCURENCE by PROVINCE: DI Aceh: 76%, Sumatera Utara: 24%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 20/03/89      Status: Final
6. LAND UNIT DESCRIPTION: Slightly dissected alluvial and colluvial fans, acid tuffs, slopes 0-5%.
7. SATELLITE SCENES : 129/58/26/06/85
8. AERIAL PHOTOGRAPHS : 1:100.000 11g / -038, 10a / -44
9. RADAR : STAR-I/250/88/0618-3,4
10. PARENT MATERIAL      11. ROCK OUTCROP: 0 %
- a. Weathering : Partial
  - b. Lithology : dacite
  - c. Formation : Qvt
12. WATER      a. Quality : Fresh  
b. Source : Rain
13. FISHERIES : Sungai (river)
14. RIVERS a. Floodrisk : None  
b. Inundation: None
15. VEGETATION/LAND USE : , mixed gardens of fruit trees, rubber (karet), unspecified estate (lain-lain), clove (cengkeh), towns, villages  
Area used : 75 %
16. ACCELERATED EROSION  
a. Occurrence : Localised  
b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	90 %	yes
Associated 1	humitropepts	10 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

ity/ / 87/as/0618/23/ /013/ ith/ / /87/d /0618/51/ /008/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. <b>Texture:</b> topsoil	moderately fine	fine	medium
subsoil	moderately fine	fine	medium
b. <b>Depth:</b> peatsoil	--	--	--
mineralsoil	very deep	very deep	deep
c. <b>Drainage:</b>	Well drained	Well drained	Well drained
d. <b>Exch. K:</b> topsoil	very low	medium	--
subsoil	very low	low	--
e. <b>Total K2O:</b> topsoil	very low	medium	low
subsoil	very low	low	low
f. <b>Avail. P:</b> method	Bray I	Bray I	
topsoil	very low	very low	--
subsoil	very low	very low	--
g. <b>Total P:</b> topsoil	very low	medium	very low
subsoil	very low	low	very low
h. <b>CEC pH 7</b> topsoil	low	high	medium
subsoil	low	low	medium
i. <b>Soil Reaction:</b> topsoil	very strong acid	excessive acid	very strong acid
subsoil	very strong acid	excessive acid	very strong acid
j. <b>Al Sat.</b> topsoil	very high	very high	--
subsoil	very high	very high	--
k. <b>Al toxicity :</b>	no	no	--
l. <b>Acid sulph. pot.:</b>	--	--	--
m. <b>Salinity :</b>	salt free	salt free	--
n. <b>Other Toxicity:</b>	--	--	--
o. <b>Root obstr. layer :</b>	150 cm	125 cm	--
p. <b>Organic Matter :</b>	1.8	3.1	0.0
q. <b>TEB :</b>	0.5	0.6	0.0
r. <b>Total observations:</b>	1	1	1

19. **ALTITUDE:** Maximum: 200 m Minimum: 75 m Range: 100 m20. **PLAN/PROFILE:** Dominant: non-linear and random > 60% of area flat-topped  
Included:21. **L.U. DRAINAGE:** a. Pattern: dendritic b. density: Low

c. Variability: low

22. **SLOPE:** a. Steepness:flat b. Variability: Low  
c. Length: d. Variability:

e. Curvature: straight

23. **SLOPE DISTR.:** Valleybottoms: 10 %

Interfluves : 0-8%:90 %, 9-25%: 0 %, 25-55%: 0 %

24. **RELIEF AMPLI.:** a. Amplitude: very low b. Variability: Low25. **TERRAIN:** Undulating 2- 8%, 0-50 m26. **CREST/RIDGES:** a. Shape: no crests b. Length: c. Variability:  
d. Width: e. Variability:27. **VALLEY FLOOR:** a. Width: very narrow b. Variability: Low28. **LAND FACETS:** -1- Middle and fans head, dystropepts, 90%

-2- valley bottom, humitropepts, 10%

-3-

-4-

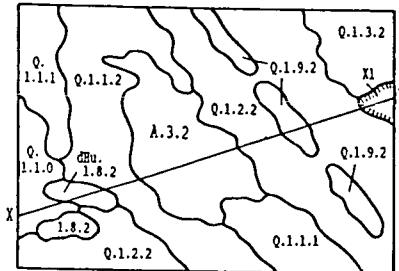
29. **FRAGMENTATION:** Valleys: Interfluves: Large blocks30. **RELIABILITY:** 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 2 14.b: 2 17: 2 18.a: 2 18.b: 2 18.c: 2

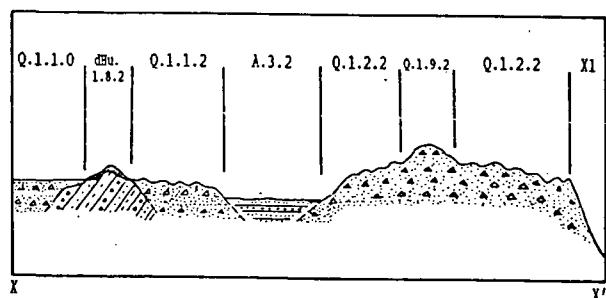
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 2 29: 2

31. **ADDITIONAL NOTES:**

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Au.3.2

2. MAP SHEET: 0618

3. AREA: 70 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 21/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Closed basin/depression, mixed sediments, slopes 0-3%.

7. SATELLITE SCENES : 128/58/08/85, 129/58/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 / - , 145 /8319-111, T2 /8323-151

9. RADAR : STAR-I/250/88/0618-1

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

a. Weathering : Slight

b. Lithology : clay, sand, peat

c. Formation : Qh

12. WATER a. Quality : Fresh

b. Source : Rain, Shallow wells

13. FISHERIES : Sungai (river)

14. RIVERS a. Floodrisk : Low

b. Imundation: Seasonal

15. VEGETATION/LAND USE : , bush, swamp (rawa) including sedges, wetland rice (sawah)

Area used : 80 %

## 16. ACCELERATED EROSION

a. Occurrence : None

b. Evidence :

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	tropohemists	70 %	no
Associated 1	andaquepts	30 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

het/ / / 87/tb/0618/32/ / 94 /	hat/ / / 87/tb/0618/33/ / 44 /
ign/ / / / 0618/ / / /	

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil subsoil	organic organic	medium moderately coarse
b. Depth:	peatsoil mineralsoil	very deep --	-- very deep
c. Drainage:		Very poorly drained	Poorly drained
d. Exch. K:	topsoil subsoil	-- --	low very low
e. Total K2O:	topsoil subsoil	-- --	low low
f. Avail. P:	method topsoil subsoil	Bray I very high very low	Bray I very low very high
g. Total P:	topsoil subsoil	-- --	low high
h. CEC pH 7	topsoil subsoil	-- --	high high
i. Soil Reaction:	topsoil subsoil	-- --	excessive acid very strong acid
j. Al Sat.	topsoil subsoil	-- --	low medium
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	150 cm	150 cm	--
p. Organic Matter :	0.0	43.4	0.0
q. TEB :	0.0	10.6	0.0
r. Total observations:	1	1	1

19. ALTITUDE: Maximum: 1400 m Minimum: 1000 m Range: 1300 m

20. PLAN/PROFILE: Dominant: No pronounced highs/lows  
Included:

21. L.U. DRAINAGE: a. Pattern: centripetal  
c. Variability: low
22. SLOPE: a. Steepness: flat  
c. Length:  
e. Curvature: concave

b. density: Very low  
b. Variability: Low  
d. Variability:

23. SLOPE DISTR.: Valleybottoms: 100 %  
Interfluves : 0-8%: 0 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low  
b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests  
c. Width:  
e. Variability:

c. Variability:

27. VALLEY FLOOR: a. Width:  
b. Variability:

28. LAND FACETS: -1- Depressions, tropohemists, 70%

-2- Transition, andaquepts, 30%

-3-

-4-

29. FRAGMENTATION: Valleys: Interfluves:

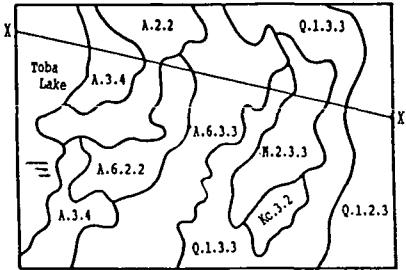
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 2 14.b: 2 17: 2 18.a: 2 18.b: 2 18.c: 2

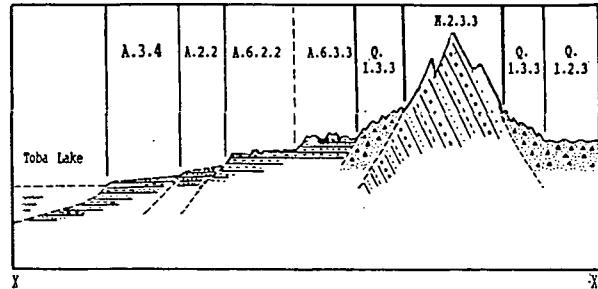
18.d-q: 2 19: 2 22: 1 23: 2 24: 1 28: 2 29:

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Afq.3.4

2. MAP SHEET: 0618

3. AREA: 29 km<sup>2</sup>

4. OCCURENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 21/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Lacustrine plain, fine and coarse sediments, slopes 0-2%.

7. SATELLITE SCENES : 128/58/08/08/85, 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 145 /8319-117, 135 /8323-119

9. RADAR : STAR-I/250/88/0618-3,4

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

- a. Weathering : Slight
- b. Lithology : clay, sand, diatomite
- c. Formation : Qh

12. WATER a. Quality : Fresh

b. Source : Perennial River, Shallow wells

13. FISHERIES : Danau (lake)

14. RIVERS a. Floodrisk : Low

b. Imundation: None

15. VEGETATION/LAND USE : , grazing land, irrigated wetland rice (irigasi), towns, villages  
Area used : 100 %

## 16. ACCELERATED EROSION

- a. Occurence : None
- b. Evidence :

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	fluvaquents	90 %	yes
Associated 1	eutropepts	10 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

eqv/ / 87/lh/0618/62/ /072/ ite/ / / 87/lh/0618/62/ /035/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil moderately coarse subsoil moderately coarse	medium fine	-- --
b. Depth:	peatsoil mineralsoil deep	-- deep	-- --
c. Drainage:	Irrigated	Irrigated	--
d. Exch. K:	topsoil medium subsoil medium	low medium	-- --
e. Total K2O:	topsoil very high subsoil very high	very high very high	-- --
f. Avail. P:	method Bray I topsoil medium subsoil very low	Bray I very low very low	-- --
g. Total P:	topsoil very low subsoil very low	high low	-- --
h. CEC pH 7	topsoil low subsoil low	low low	-- --
i. Soil Reaction:	topsoil excessive acid subsoil excessive acid	excessive acid very strong acid	-- --
j. Al Sat.	topsoil very low subsoil very low	low low	-- --
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	not relevant	not relevant	--
m. Salinity :	--	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	120 cm	--
p. Organic Matter :	1.5	1.1	0.0
q. TEB :	3.0	2.7	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 925 m Minimum: 900 m Range: 910 m

20. PLAN/PROFILE: Dominant: No pronounced highs/lows

Included:

21. L.U. DRAINAGE: a. Pattern: meandering b. density: Very low  
c. Variability:22. SLOPE: a. Steepness: flat b. Variability: Low  
c. Length: d. Variability:  
e. Curvature: straight23. SLOPE DISTR.: Valleybottoms: 90 %  
Interfluves : 0-8%:10 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:  
d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: b. Variability:

28. LAND FACETS: -1- Lower part, fluvaquents, 90%

-2- Upper part(interfluves, eutropepts, 10%

-3-

-4-

29. FRAGMENTATION: Valleys: Interfluves:

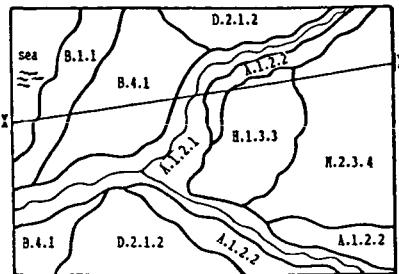
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 2 14.b: 2 17: 2 18.a: 1 18.b: 1 18.c: 1

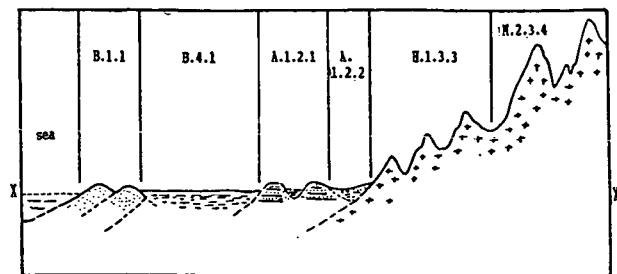
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 2 29:

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Bfq.1.1
2. MAP SHEET: 0618
3. AREA: 191 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: DI Aceh: 84%, Sumatera Utara: 16%
5. STATUS IDENTIFIERS : Updated by: DR edit date: 21/03/89 Status: Final
6. LAND UNIT DESCRIPTION: Complex of beach ridges and swales, fine and coarse sediments (unripe).
7. SATELLITE SCENES : 129/59/26/06/85, 129/58/26/06/85
8. AERIAL PHOTOGRAPHS : 1:100.000 9b / -54 , 10c / -040,
9. RADAR : STAR-I/250/88/618-1346
10. PARENT MATERIAL
  - a. Weathering : Slight
  - b. Lithology : sand, clay
  - c. Formation : Qh
11. ROCK OUTCROP: 0 %
12. WATER
  - a. Quality : Brackish
  - b. Source : Rain
13. FISHERIES : Laut (sea)
14. RIVERS
  - a. Floodrisk : None
  - b. Inundation: None
15. VEGETATION/LAND USE : coastal forest on beaches, mixed gardens of fruit trees, coconut (kelapa), beaches, towns, villages
 

Area used : 20 %
16. ACCELERATED EROSION
  - a. Occurrence :
  - b. Evidence :

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	tropopsammets	60 %	yes
Associated 1	psammaquents	30 %	yes
Associated 2	sulfaquents	10 %	no

## 32. REPRESENTATIVE PROFILES:

est/ / 87/mk/0618/14/ /6 / eqs/ / 87/mk/0618/14/ /5 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>		<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil	coarse	coarse	--
	subsoil	coarse	coarse	--
b. Depth:	peatsoil	--	--	--
	mineralsoil	moderately deep	deep	--
c. Drainage:		Excessively drained	Excessively drained	--
d. Exch. K:	topsoil	very low	very low	--
	subsoil	very low	very low	--
e. Total K2O:	topsoil	medium	high	--
	subsoil	medium	high	--
f. Avail. P:	method	Bray I	Bray I	
	topsoil	very low	very low	--
	subsoil	very low	very low	--
g. Total P:	topsoil	very low	low	--
	subsoil	low	medium	--
h. CEC pH 7	topsoil	low	very low	--
	subsoil	very low	very low	--
i. Soil Reaction:	topsoil	very strong acid	very strong acid	--
	subsoil	strong acid	strong acid	--
j. Al Sat.	topsoil	low	low	--
	subsoil	low	low	--
k. Al toxicity :		--	--	--
l. Acid sulph. pot.:		--	--	--
m. Salinity :		--	--	--
n. Other Toxicity:		--	--	--
o. Root obstr. layer :		--	--	--
p. Organic Matter :	2.4	0.7	0.0	
q. TEB :	0.8	0.7	0.0	
r. Total observations:	5	1	0	

19. ALTITUDE: Maximum: 0 m Minimum: 3 m Range: 2 m

20. PLAN/PROFILE: Dominant: linear and parallel No pronounced highs/lows

Included:

21. L.U. DRAINAGE: a. Pattern: parallel b. density: Moderate  
c. Variability: low22. SLOPE: a. Steepness: flat b. Variability: Low  
c. Length: very short d. Variability: Low  
e. Curvature: concave23. SLOPE DISTR.: Valleybottoms: 40 %  
Interfluves : 0-8%:60 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:  
d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: b. Variability:

28. LAND FACETS: -1- Ridges, tropopsammens, 60%  
-2- Swales, psammaquents, 30%  
-3- Swalls, sulfaquents, 10%  
-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Small blocks

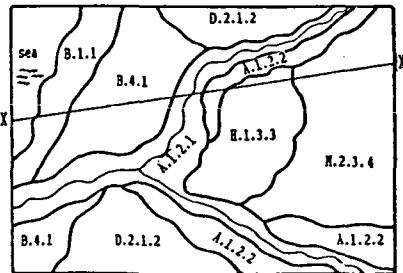
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 2 14.b: 2 17: 1 18.a: 1 18.b: 2 18.c: 2

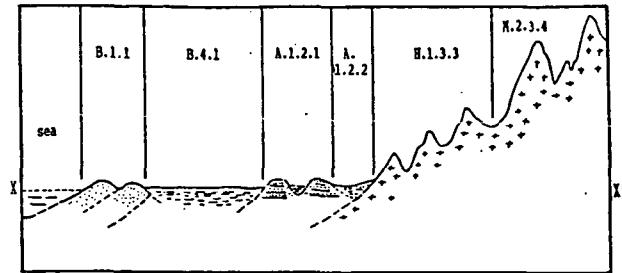
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 2 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Bf.4.1      2. MAP SHEET: 0618      3. AREA: 45 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: DI Aceh: 58%, Sumatera Utara: 42%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 21/03/89      Status: Final
6. LAND UNIT DESCRIPTION: Tidal mud flats, fine and coarse sediments unripe.
7. SATELLITE SCENES : 129/58/08/08/85, 129/59/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 10c / -040, 10b / -038, 10c / -058
9. RADAR : STAR-I/250/88/0618-1,4
10. PARENT MATERIAL
  - a. Weathering : Slight
  - b. Lithology : clay
  - c. Formation : Qh
11. ROCK OUTCROP: 0 %
12. WATER
  - a. Quality : Saline
  - b. Source : Rain
13. FISHERIES : Laut (sea)
14. RIVERS
  - a. Floodrisk : Not known
  - b. Inundation: Medium Tidal Range
15. VEGETATION/LAND USE : tidal forest, swamp (rawa) including sedges, fishponds (tambak)
   
Area used : 10 %
16. ACCELERATED EROSION
  - a. Occurrence : None
  - b. Evidence :
17. SOIL GREAT GROUP :
 

	Classification	% of area	Lab. checked
Dominant >50%	hydraqents	80 %	yes
Associated 1	sulfaquents	20 %	no
Associated 2			
32. REPRESENTATIVE PROFILES:

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine	--	--
	subsoil fine	--	--
b. Depth:	peatsoil Shallow	--	--
	mineralsoil deep	--	--
c. Drainage:	Very poorly drained	--	--
d. Exch. K:	topsoil very high	--	--
	subsoil very high	--	--
e. Total K2O:	topsoil high	--	--
	subsoil high	--	--
f. Avail. P:	method		
	topsoil --	--	--
	subsoil --	--	--
g. Total P:	topsoil low	--	--
	subsoil medium	--	--
h. CEC pH 7	topsoil low	--	--
	subsoil medium	--	--
i. Soil Reaction:	topsoil very strong acid	--	--
	subsoil strong acid	--	--
j. Al Sat.	topsoil --	--	--
	subsoil --	--	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	--	--	--
p. Organic Matter :	0.0	0.0	0.0
q. TEB :	0.0	0.0	0.0
r. Total observations:	1	0	0

19. ALTITUDE: Maximum: 3 m Minimum: m Range: 2 m

20. PLAN/PROFILE: Dominant: No pronounced highs/lows

Included:

21. L.U. DRAINAGE: a. Pattern: reticular b. density: Very low

c. Variability:

22. SLOPE: a. Steepness: flat b. Variability: Low

c. Length:

d. Variability:

e. Curvature:

23. SLOPE DISTR.: Valleybottoms: 100 %

Interfluves : 0-8%: 0 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:

d. Width:

e. Variability:

27. VALLEY FLOOR: a. Width: b. Variability:

28. LAID FACETS: -1- Tidal flats, hydraquents, 80%

-2- Tidal flats, sulfaquents, 20%

-3-

-4-

29. FRAGMENTATION: Valleys: Interfluves:

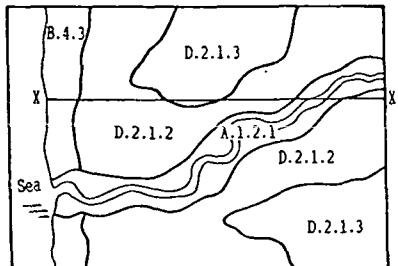
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 2 14.b: 2 17: 3 18.a: 2 18.b: 2 18.c: 2

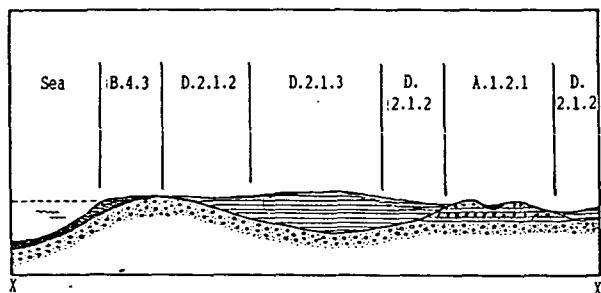
18.d-q: 3 19: 1 22: 1 23: 2 24: 1 28: 2 29:

31. ADDITIONAL NOTES: Extrapolation based on RePPPProt KJP System.

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Bfq.4.3

2. MAP SHEET: 0618

3. AREA: 31 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: DI Aceh: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Tidal flats with mangrove vegetation, fine and coarse sediments (unripe).

7. SATELLITE SCENES : 129/58/08/08/85, 129/59/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 10c / -040, 10c / -038, 10c / -058

9. RADAR : STAR-I/250/88/0618-146

## 10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : Slight

b. Lithology : clay, sand

c. Formation : Qh

12. WATER a. Quality : Saline

b. Source : Rain

13. FISHERIES : Laut (sea)

14. RIVERS a. Floodrisk : Not known

b. Imundation: Medium Tidal Range

15. VEGETATION/LAND USE : tidal forest, swamp (rawa) including sedges

Area used : 0 %

## 16. ACCELERATED EROSION

a. Occurrence : None

b. Evidence :

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	hydraqents	65 %	no
Associated 1	sulfaquents	30 %	no
Associated 2	psammaquents	5 %	no

## 32. REPRESENTATIVE PROFILES:

eqw/ / 87/d /0618/43/ /019/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	fine	fine	moderately coarse
subsoil	fine	fine	coarse
b. Depth: peatsoil	Shallow	Shallow	--
mineralsoil	extremely deep	very deep	moderately deep
c. Drainage:	Very poorly drained	Very poorly drained	Poorly drained
d. Exch. K: topsoil	very high	--	--
subsoil	very high	--	--
e. Total K2O: topsoil	high	--	--
subsoil	high	--	--
f. Avail. P: method			
topsoil	--	--	--
subsoil	--	--	--
g. Total P: topsoil	low	--	--
subsoil	medium	--	--
h. CEC pH 7 topsoil	low	--	--
subsoil	medium	--	--
i. Soil Reaction: topsoil	slightly acid	--	--
subsoil	slightly acid	--	--
j. Al Sat. topsoil	--	--	--
subsoil	--	--	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	--	--	--
p. Organic Matter :	0.0	0.0	0.0
q. TEB :	0.0	0.0	0.0
r. Total observations:	2	0	0

19. ALTITUDE: Maximum: 3 m Minimum: 1 m Range: 2 m

20. PLAN/PROFILE: Dominant: No pronounced highs/lows

Included:

21. L.U. DRAINAGE: a. Pattern: reticular b. density: Very low

c. Variability: low

22. SLOPE: a. Steepness:flat b. Variability: Low

c. Length:

d. Variability:

e. Curvature:

23. SLOPE DISTR.: Valleybottoms: 100 %

Interfluves : 0-8%:0 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:

d. Width:

e. Variability:

27. VALLEY FLOOR: a. Width: b. Variability:

28. LAND FACETS: -1- Tidal flats, hydraquents, 65%

-2- Tidal flats, sulfaquents, 30%

-3- Transition, psammaquents, 5%

-4-

29. FRAGMENTATION: Valleys: Interfluves:

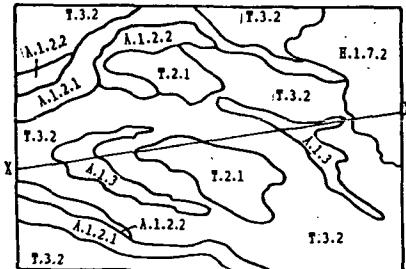
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 2 14.b: 2 17: 3 18.a: 2 18.b: 2 18.c: 1

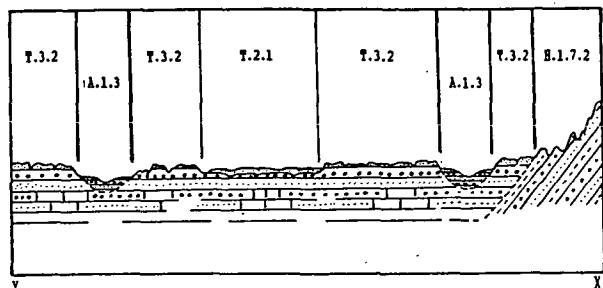
18.d-q: 3 19: 2 22: 2 23: 2 24: 2 28: 2 29:

31. ADDITIONAL NOTES: 17\18 extrapolation and based on RePPPProt KJP system.

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Tq. 2.1

2. MAP SHEET: 0618

3. AREA: 109 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: DI Aceh: 81%, Sumatera Utara: 19%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 21/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Slightly dissected undulating marine terraces, coarse sediments, slopes 3-8%

7. SATELLITE SCENES : 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 10a / -046, 9b / -052, 10b / -020

9. RADAR : STAR-I/250/88/0618-134

## 10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : High

b. Lithology : sandstone, conglomerate

c. Formation : QTt , Qh

12. WATER a. Quality : Fresh

b. Source : Rain, Shallow wells

13. FISHERIES : Sungai (river)

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , bush, alang-alang, upland crops, mixed gardens of fruit trees, oil palm (kelapa sawit), towns, villages

Area used : 60 %

## 16. ACCELERATED EROSION

a. Occurrence : Localised

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	hapludox	60 %	yes
Associated 1	dystropepts	30 %	yes
Associated 2	tropaquepts	10 %	yes

## 32. REPRESENTATIVE PROFILES:

odh/ /	/87/DR/0618/42/ /11 /	igt/ /	/87/TB/0618/22/ /47 /
ity/ /	/87/AH/0618/51/ /10 /		

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil moderately fine subsoil moderately fine	moderately fine moderately fine	fine fine
b. Depth:	peatsoil mineralsoil	-- very deep	-- very deep
c. Drainage:		Well drained	Poorly drained
d. Exch. K:	topsoil very low subsoil very low	very low very low	low low
e. Total K2O:	topsoil medium subsoil medium	very high high	very high medium
f. Avail. P:	method topsoil very low subsoil very low	Bray I very low very low	Bray I very low very low
g. Total P:	topsoil very low subsoil very low	very low very low	high very high
h. CEC pH 7	topsoil low subsoil very low	very low very low	medium medium
i. Soil Reaction:	topsoil strong acid subsoil strong acid	very strong acid very strong acid	strong acid strong acid
j. Al Sat.	topsoil low subsoil very low	medium medium	low very low
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	--	--	--
p. Organic Matter :	2.1	2.3	2.6
q. IEB :	1.2	0.4	2.6
r. Total observations:	3	1	1

19. ALTITUDE: Maximum: 75 m Minimum: 25 m Range: 50 m

20. PLAN/PROFILE: Dominant: non-linear and random 40-60% of area flat-topped  
Included:

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Low  
c. Variability:
22. SLOPE: a. Steepness: gently sloping b. Variability: Low  
c. Length: long d. Variability: Medium  
e. Curvature: convex
23. SLOPE DISTR.: Valleybottoms: 10 %  
Interfluves : 0-8%: 90 %, 9-25%: 0 %, 25-55%: 0 %
24. RELIEF AMPLI.: a. Amplitude: low b. Variability: Low
25. TERRAIN: Undulating 2- 8%, 0-50 m
26. CREST/RIDGES: a. Shape: Level b. Length: Short c. Variability: Low  
d. Width: narrow e. Variability: Low
27. VALLEY FLOOR: a. Width: narrow b. Variability: Low
28. LAND FACETS: -1- Flat tops, ridges, hapludox, 60%  
-2- Slopes, dystropepts, 30%  
-3- Valley bottoms, tropaquepts, 10%  
-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Large blocks

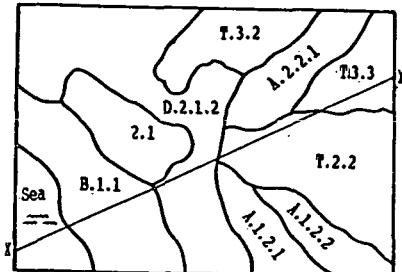
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 1 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 1

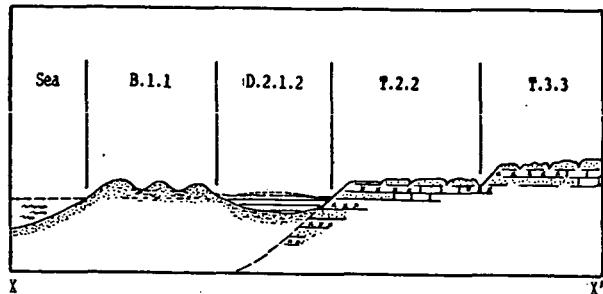
18.d-q: 2 19: 2 22: 1 23: 2 24: 1 28: 3 29: 2

31. ADDITIONAL NOTES: Local coral outcrops

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Tq.2.2      2. MAP SHEET: 0618      3. AREA: 108 km<sup>2</sup>

4. OCCURENCE by PROVINCE: DI Aceh: 67%, Sumatera Utara: 33%

5. STATUS IDENTIFIERS : Updated by: DR      edit date: 21/03/89      Status: Final

6. LAND UNIT DESCRIPTION: Moderately dissected undulating marine terraces, coarse sediments, slope 3 -8%.

7. SATELLITE SCENES : 129/59/08/08/85, 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 10a / -056, 10b / -020, 9b / -050

9. RADAR : STAR-I/250/88/618-1A,3

10. PARENT MATERIAL      11. ROCK OUTCROP: %

a. Weathering : Partial

b. Lithology : sandstone, conglomerate

c. Formation : QTt , Qh

12. WATER a. Quality : Fresh

b. Source : Perennial River, Rain

13. FISHERIES : None

14. RIVERS a. Floodrisk : None .

b. Inundation: None

15. VEGETATION/LAND USE : , bush, shifting cultivation, upland crops, rainfed wetland rice, towns, villages

Area used : 60 %

16. ACCELERATED EROSION

a. Occurrence : Localised

b. Evidence : Various

17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	60 %	yes
Associated 1	kandiudox	30 %	yes
Associated 2	tropaquepts	10 %	yes

## 32. REPRESENTATIVE PROFILES:

ity/	/300-7	/84/MH/0618/42/	/3 /	odk/	/	/87/PR/0618/14/	/87 /
iqt/	/	/87/TB/0618/22/	/47 /				

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	moderately fine moderately fine	fine fine
b. Depth:	peatsoil -- mineralsoil moderately deep	-- very deep	-- very deep
c. Drainage:	Well drained	Well drained	Poorly drained
d. Exch. K:	topsoil medium subsoil very low	very low very low	low low
e. Total K2O:	topsoil medium subsoil very low	very low very low	very high medium
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	Bray I very low very low
g. Total P:	topsoil low subsoil very low	very low very low	high very high
h. CEC pH 7	topsoil low subsoil low	very low very low	medium low
i. Soil Reaction:	topsoil very strong acid subsoil strong acid	very strong acid very strong acid	strong acid strong acid
j. Al Sat.	topsoil very low subsoil very low	medium low	low very low
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	87 cm	125 cm	120 cm
p. Organic Matter :	2.2	1.5	2.6
q. TEB :	1.2	0.7	2.6
r. Total observations:	1	1	1

19. ALTITUDE: Maximum: 75 m Minimum: 25 m Range: 40 m

20. PLAN/PROFILE: Dominant: non-linear and random 40-60% of area flat-topped  
Included:

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Moderate

c. Variability: low

22. SLOPE: a. Steepness:gently sloping b. Variability: Medium  
c. Length: moderate d. Variability: Low

e. Curvature: convex

23. SLOPE DISTR.: Valleybottoms: 10 % Interfluves : 0-8%:90 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: low b. Variability: Low

25. TERRAIN: Undulating 2- 8%, 0-50 m

26. CREST/RIDGES: a. Shape: Level b. Length:Short c. Variability: Low  
d. Width: narrow e. Variability: Low

27. VALLEY FLOOR: a. Width: narrow b. Variability: Low

28. LAND FACETS: -1- Crests and slopes, dystropepts, 60%

-2- Flat tops, kandiudox, 30%

-3- Valley bottoms, tropaquepts, 10%

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Small blocks

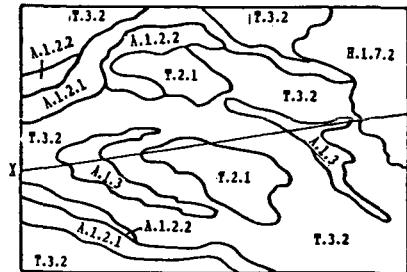
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 1

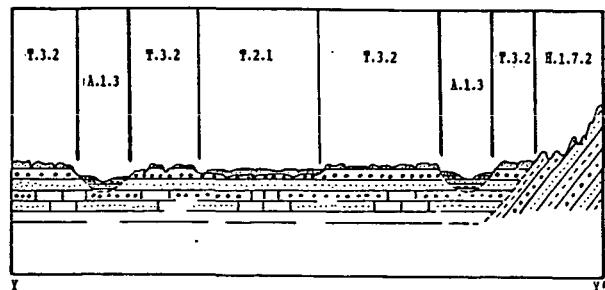
18.d-q: 2 19: 2 22: 1 23: 2 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Tfg. 3.2      2. MAP SHEET: 0618      3. AREA: 500 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: DI Aceh: 98%, Sumatera Utara: 2%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 21/03/89      Status: Final
6. LAND UNIT DESCRIPTION: Moderately dissected rolling marine terraces, fine and coarse sediments, slopes 8-15%.
7. SATELLITE SCENES : 129/59/08/08/85, 129/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 11g / -024, 10c / -050, 10b / -020
9. RADAR : STAR-I/250/88/0618-1,3
10. PARENT MATERIAL      11. ROCK OUTCROP: 0 %
- a. Weathering : Partial
  - b. Lithology : clay, conglomerate, sandstone
  - c. Formation : QTt , Qh
12. WATER      a. Quality : Fresh  
b. Source : Rain, Perennial River
13. FISHERIES : None
14. RIVERS a. Floodrisk : None  
b. Inundation: None
15. VEGETATION/LAND USE : secondary forest, bush, shifting cultivation, upland crops, rainfed wetland rice, rubber (karet), coffee (kopi), towns, villages  
Area used : 50 %
16. ACCELERATED EROSION
- a. Occurrence : Localised
  - b. Evidence : Various
- 
17. SOIL GREAT GROUP :
- |               | Classification | % of area | Lab. checked |
|---------------|----------------|-----------|--------------|
| Dominant >50% | dystropepts    | 70 %      | yes          |
| Associated 1  | kandiudox      | 25 %      | yes          |
| Associated 2  | hapludults     | 5 %       | yes          |
- 
32. REPRESENTATIVE PROFILES:
- | ity/ | /17.8  | /82/hd/0618/42/ | /2 / | odk/ | / | /87/ah/0618/42/ | /13 / |
|------|--------|-----------------|------|------|---|-----------------|-------|
| uda/ | /17.10 | /82/hd/0618/42/ | /7 / | /    | / | / / 0618/       | / / / |

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately fine	fine	fine
subsoil	medium	fine	fine
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	deep
c. Drainage:	Moderately well	Well drained	Well drained
d. Exch. K: topsoil	very high	very low	very high
subsoil	very high	very low	very high
e. Total K2O: topsoil	very low	very low	very low
subsoil	very low	very low	very low
f. Avail. P: method	Bray I	Bray I	Bray I
topsoil	very low	very low	very low
subsoil	very low	very low	very low
g. Total P:	topsoil	very low	very low
subsoil	very low	very low	very low
h. CEC pH 7	topsoil	very low	very low
subsoil	very low	very low	very low
i. Soil Reaction: topsoil	very strong acid	strong acid	excessive acid
subsoil	very strong acid	very strong acid	excessive acid
j. Al Sat.	topsoil	very low	very high
subsoil	very low	medium	very low
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	130 cm	130 cm	--
p. Organic Matter :	1.8	2.0	2.2
q. TEB :	7.1	2.4	8.1
r. Total observations:	1	11	3

19. ALTITUDE: Maximum: 100 m Minimum: 25 m Range: 75 m

20. PLAN/PROFILE: Dominant: non-linear and random < 40% of area crested/peaked  
Included: non-linear and random 40-60% of area crested/peaked21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Moderate  
c. Variability: medium22. SLOPE: a. Steepness:sloping b. Variability: Medium  
c. Length: moderate d. Variability: Medium  
e. Curvature: convex23. SLOPE DISTR.: Valleybottoms: 0 %  
Interfluves : 0-8%:45 %, 9-25%: 55 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Low

25. TERRAINE: Rolling 9-15%, 0-50 m

26. CREST/RIDGES: a. Shape: Level b. Length:Short c. Variability: Low  
d. Width: narrow e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Crest/upper slopes, , 25%  
-2- Middle slopes, hapludults, 5%  
-3- Lower slopes, dystropepts, 70%  
-4-

29. FRAGMENTATION: Valleys: Interfluves: Small blocks

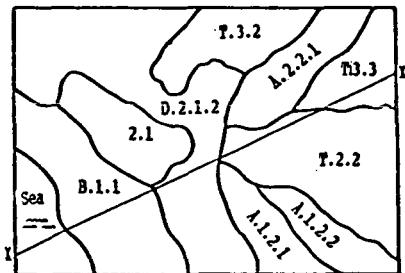
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 1 14.a: 2 14.b: 1 17: 2 18.a: 1 18.b: 2 18.c: 2

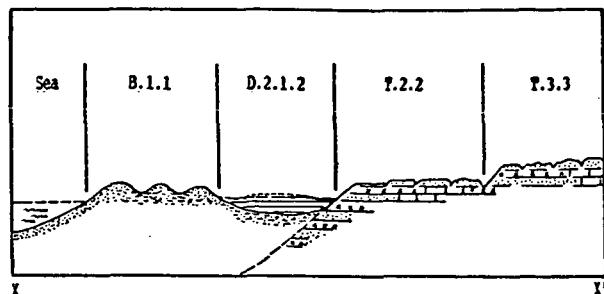
18.d-q: 2 19: 2 22: 2 23: 2 24: 1 28: 2 29: 3

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Tfq.3.3      2. MAP SHEET: 0618      3. AREA: 214 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: DI Aceh: 99%, Sumatera Utara: 0%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 22/03/89      Status: Final
6. LAND UNIT DESCRIPTION: Strongly dissected rolling marine terraces, fine and coarse sediments, slopes 8-25%
7. SATELLITE SCENES : 129/59/08/08/85, 129/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 9b / -054, 10b / -048, 10c / -022
9. RADAR : STAR-I/250/88/618-2345
10. PARENT MATERIAL      11. ROCK OUTCROP: %
- a. Weathering : High
  - b. Lithology : conglomerate, sandstone
  - c. Formation : QTt , Qh
12. WATER a. Quality : Fresh  
b. Source : Rain, Perennial River
13. FISHERIES : Sungai (river)
14. RIVERS a. Floodrisk : None  
b. Inundation: None
15. VEGETATION/LAND USE : moist primary lowland forest, bush, oil palm (kelapa sawit)  
Area used : 20 %
16. ACCELERATED EROSION  
a. Occurrence : Common  
b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	70 %	yes
Associated 1	hapludox	25 %	yes
Associated 2	hapludults	5 %	yes

## 32. REPRESENTATIVE PROFILES:

ity/	/17-6	/82/AH/0618/42/	/5 /	odh/	/	/87/PR/0618/14/	/14 /
uda/	/17-10	/82/HD/0618/42/	/7 /				

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. <b>Texture:</b>	<b>topsoil</b> moderately fine <b>subsoil</b> fine	fine fine	fine fine
b. <b>Depth:</b>	<b>peatsoil</b> -- <b>mineralsoil</b> very deep	-- very deep	-- deep
c. <b>Drainage:</b>	Well drained	Well drained	Well drained
d. <b>Exch. K:</b>	<b>topsoil</b> low <b>subsoil</b> low	very low very low	very high very high
e. <b>Total K2O:</b>	<b>topsoil</b> very high <b>subsoil</b> very high	very low very low	very low very low
f. <b>Avail. P:</b>	<b>method</b> Bray I <b>topsoil</b> very low <b>subsoil</b> very low	Bray I very low very low	Bray I very low very low
g. <b>Total P:</b>	<b>topsoil</b> very high <b>subsoil</b> high	very low very low	very low very low
h. <b>CEC pH 7</b>	<b>topsoil</b> low <b>subsoil</b> low	very low very low	very low very low
i. <b>Soil Reaction:</b>	<b>topsoil</b> excessive acid <b>subsoil</b> very strong acid	excessive acid very strong acid	excessive acid excessive acid
j. <b>Al Sat.</b>	<b>topsoil</b> high <b>subsoil</b> high	high medium	very low very low
k. <b>Al toxicity :</b>	no	no	--
l. <b>Acid sulph. pot.:</b>	--	--	--
m. <b>Salinity :</b>	salt free	salt free	salt free
n. <b>Other Toxicity:</b>	--	--	--
o. <b>Root obstr. layer :</b>	135 cm	120 cm	--
p. <b>Organic Matter :</b>	1.1	1.6	2.2
q. <b>TEB :</b>	0.5	0.6	8.1
r. <b>Total observations:</b>	1	2	2

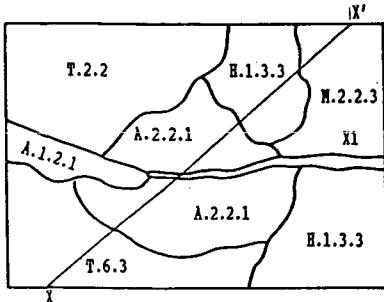
19. **ALTITUDE:** Maximum: 50 m Minimum: 100 m Range: 60 m20. **PLAN/PROFILE:** Dominant: non-linear and random 40-60% of area crested/peaked  
Included:21. **L.U. DRAINAGE:** a. **Pattern:** dendritic b. **density:** Mod. high  
c. **Variability:** medium22. **SLOPE:** a. **Steepness:** sloping b. **Variability:** Medium  
c. **Length:** moderate d. **Variability:**  
e. **Curvature:** convex23. **SLOPE DISTR.:** Valleybottoms: 5 %  
Interfluves : 0-8%:35 % , 9-25%: 60 % , 25-55%: 0 %24. **RELIEF AMPLI.:** a. **Amplitude:** medium b. **Variability:** Medium25. **TERRAIN:** Rolling 9-15%, 0-50 m26. **CREST/RIDGES:** a. **Shape:** Level b. **Length:** Short c. **Variability:** Low  
d. **Width:** narrow e. **Variability:** Low27. **VALLEY FLOOR:** a. **Width:** very narrow b. **Variability:** Low28. **LAND FACETS:** -1- Crest upper slopes, hapludox, 25%  
-2- Lower slopes, dystropepts, 70%  
-3- Midle slopes, hapludults, 5%  
-4-29. **FRAGMENTATION:** Valleys: Interfluves: Medium blocks30. **RELIABILITY:** 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 1 14.a: 1 14.b: 2 17: 2 18.a: 1 18.b: 2 18.c: 2

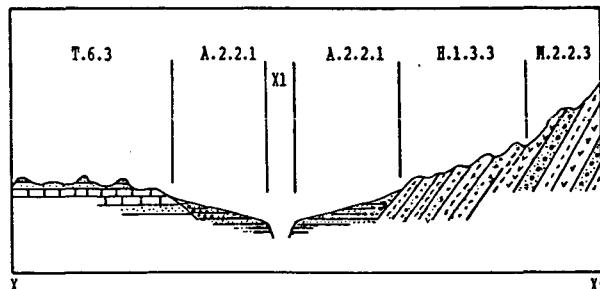
18.d-q: 2 19: 2 22: 1 23: 2 24: 2 28: 2 29: 3

31. **ADDITIONAL NOTES:**

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Tfq.6.3

2. MAP SHEET: 0618

3. AREA: 97 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: DI Aceh: 77%, Sumatera Utara: 23%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected rolling marine terrace with hillocks, fine and coarse sediments, slopes 8-25%

7. SATELLITE SERIES : 129/59/08/08/85, 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 10a / -054, 11f / -055

9. RADAR : star-I/250/88/618-1A, 4

## 10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : High

b. Lithology : conglomerate, sandstone

c. Formation : QTt , Qh

12. WATER a. Quality : Fresh

b. Source : Rain

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : moist primary lowland forest, secondary forest, bush, alang-alang, upland crops, towns, villages

Area used : 60 %

## 16. ACCELERATED EROSION

a. Occurrence : Localised

b. Evidence : Landslips

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	70 %	yes
Associated 1	hapludox	30 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

ity/ / 87/DK/0618/51/ /7 / odh/ /30.2 /84/hd/0618/42/ /2 /

## 18. SOIL CHARACTERISTICS

<b>Properties</b>		<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated</b>
a. Texture:	topsoil	fine	fine	--
	subsoil	fine	fine	--
b. Depth:	peatsoil	--	--	--
	mineralsoil	very deep	mod. shallow	--
c. Drainage:		Well drained	Well drained	--
d. Exch. K:	topsoil	very low	very high	--
	subsoil	very low	very high	--
e. Total K2O:	topsoil	medium	very low	--
	subsoil	high	very low	--
f. Avail. P:	method	Bray I	Bray I	--
	topsoil	very low	very low	--
	subsoil	very low	very low	--
g. Total P:	topsoil	very low	very low	--
	subsoil	very low	very low	--
h. CEC pH 7	topsoil	low	very low	--
	subsoil	very low	very low	--
i. Soil Reaction:	topsoil	strong acid	very strong acid	--
	subsoil	moderately acid	strong acid	--
j. Al Sat.	topsoil	--	--	--
	subsoil	--	--	--
k. Al toxicity :		--	--	--
l. Acid sulph. pot.:		--	--	--
m. Salinity :		salt free	salt free	--
n. Other Toxicity:		--	--	--
o. Root obstr. layer :	120 cm	49 cm		--
p. Organic Matter :	2.4	2.9		0.0
q. TEB :	2.8	7.5		0.0
r. Total observations:	3	1		0

**19. ALTITUDE:** Maximum: 200 m Minimum: 35 m Range: 75 m

**20. PLAN/PROFILE:** Dominant: non-linear and random > 60% of area crested/peaked  
Included:

**21. L.U. DRAINAGE:** a. Pattern: dendritic b. density: Mod. high  
c. Variability: medium

**22. SLOPE:**      a. **Steepness:** sloping  
                          c. **Length:** short  
                          e. **Curvature:** convex

**b. Variability:** Medi  
                          d. **Variability:** Medi

**23. SLOPE DISTR.: Valleybottoms: 5 %**

**25. TERRAIN:** Rolling 9-15%, 0-50 m

#### b Variabilität: Medium

26. CREST/RIDGES: a. Shape: Irregular b. Length: Short  
d. Width: Moderate e. Variability: Medium

27 VALLEY FLOOR- d. Width: moderate e. Variability: Medium

**28 LAND FACTS:** -1= Rolling land, hilly, 30%

-2- Hilltop land dystrophic 70

-3-

-4-

**29. FRAGMENTATION:** Valleys: Interfluves: Medium blocks

**30. RELIABILITY:** 1= reliable, 2= probable, 3= tenable, 4= plausible

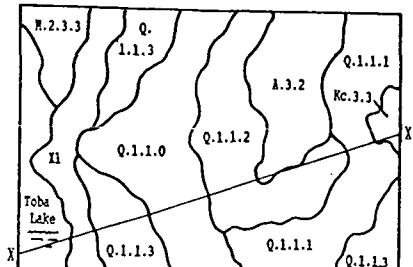
**10.b** : 2   **12.a**: 1   **14.a**: 1   **14.b**: 2   **17**: 2   **18.a**: 1   **18.b**: 2   **18.c**: 1

**18.d-q:** 2      **19:** 2      **22:** 2      **23:** 2    **24:** 1      **28:** 2      **29:** 3

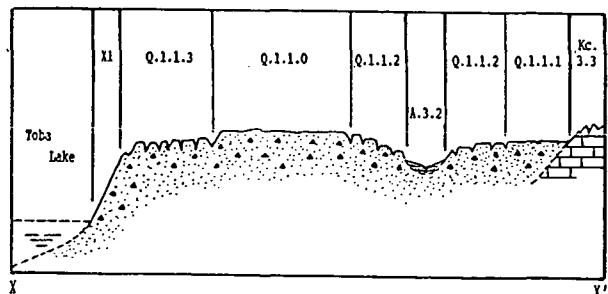
[View Details](#) | [Edit](#) | [Delete](#)

**31. ADDITIONAL NOTES:**

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.1.1.0      2. MAP SHEET: 0618      3. AREA: 292 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 22/03/89      Status: Final
6. LAND UNIT DESCRIPTION: Not dissected Toba Tuff plateau, acid tuffs, slopes 0-3%
7. SATELLITE SCENES : 128/58/08/08/85, 129/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 rt21/8323-147, 145 /8319-117, 12b /2 -05
9. RADAR : star-I/250/88/0618-1,3
10. PARENT MATERIAL      11. ROCK OUTCROP: 0 %
- a. Weathering : Partial
  - b. Lithology : dacite
  - c. Formation : Qvt
12. WATER a. Quality : Fresh  
b. Source : Rain, Shallow wells
13. FISHERIES : Sungai (river)
14. RIVERS a. Floodrisk : None  
b. Immudation: None
15. VEGETATION/LAND USE : swamp forest (rawa), pinus forests, bush, alang-alang, upland crops, horticultural crops, rainfed wetland rice, reafforestation, towns, villages  
Area used : 60 %
16. ACCELERATED EROSION  
a. Occurrence : None  
b. Evidence :
17. SOIL GREAT GROUP :  

	Classification	% of area	Lab. checked
Dominant >50%	hydrandepts	70 %	yes
Associated 1	andaquepts	20 %	yes
Associated 2	troposaprists	10 %	yes
32. REPRESENTATIVE PROFILES:  
 inw/ / /87/mr/0618/32/ /020/ ign/ / /87/tb/0618/61/ /005/  
 hat/ / /87/jh/0618/54/ /023/ sot/ / /87/pt/0618/54/ /015/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil moderately fine subsoil fine	medium moderately coarse	organic organic
b. Depth:	peatsoil -- mineralsoil very deep	-- very deep	extremely deep
c. Drainage:	Well drained	Poorly drained	Very poorly drained
d. Exch. K:	topsoil low subsoil very low	low very low	medium low
e. Total K2O:	topsoil very high subsoil very high	low low	medium low
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very high very low	Bray I very high low
g. Total P:	topsoil low subsoil very low	low high	very high medium
h. CEC pH 7	topsoil low subsoil low	high high	very low very low
i. Soil Reaction:	topsoil strong acid subsoil strong acid	excessive acid very strong acid	excessive acid excessive acid
j. Al Sat.	topsoil low subsoil medium	low medium	very high very high
k. Al toxicity :	no	no	no
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	110 cm	150 cm	140 cm
p. Organic Matter :	3.0	43.4	83.5
q. TEB :	0.6	10.6	2.4
r. Total observations:	1	1	1

19. ALTITUDE: Maximum: 1800 m Minimum: 1300 m Range: 1500 m

20. PLATE/PROFILE: Dominant: linear and parallel No pronounced highs/lows

Included: linear and parallel &gt; 60% of area flat-topped

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Very low

c. Variability: low

22. SLOPE: a. Steepness:flat b. Variability: Low

c. Length: extremely d. Variability: Low

e. Curvature: straight

23. SLOPE DISTR.: Valleybottoms: 30 %

Interfluves : 0-8%:70 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:

d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Flat tops, hydrandepts, 70%

-2- Depressions, andaquepts, 20%

-3- Depressions, troposaprists, 10%

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Large blocks

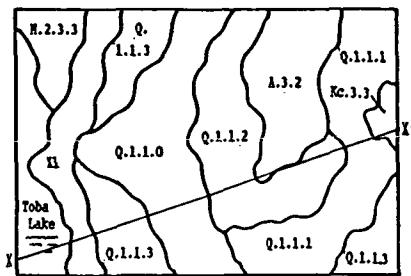
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 1 14.a: 1 14.b: 1 17: 1 18.a: 1 18.b: 2 18.c: 2

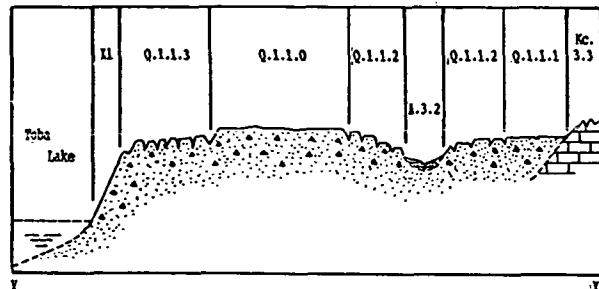
18.d-q: 2 19: 2 22: 1 23: 2 24: 1 28: 2 29: 2

31. ADDITIONAL NOTES: In the flat top inw association with sot

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.1.1.1

2. MAP SHEET: 0618

3. AREA: 426 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Slightly dissected Toba Tuff plateau, acid tuffs, slopes 0-3%

7. SATELLITE SCENES : 128/58/08/08/85, 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 145 /8319-117, T2 /8323-147, 135 /8323-105

9. RADAR : star-I/250/88/0618-1, 3

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

a. Weathering : Partial

b. Lithology : dacite

c. Formation : Qvt

12. WATER a. Quality : Fresh

b. Source : Rain, Shallow wells

13. FISHERIES : Sungai (river)

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , bush, alang-alang, horticultural crops, upland crops, irrigated wetland rice (irigasi), tea (teh), reafforestation, towns, villages

Area used : 75 %

## 16. ACCELERATED EROSION

a. Occurrence : Localised

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	hydrandepts	70 %	yes
Associated 1	andaquepts	20 %	yes
Associated 2	dystrandeps	10 %	yes

## 32. REPRESENTATIVE PROFILES:

inw/	/	/87/md/0618/	/	/3	/	inw/	/	/87/mr/0618/	/	/4	/
ign/	/	/87/pb/0618/	/	/5	/	iny/	/	/87/jh/0618/	/	/41	/
iny/	/	/87/md/0618/	/	/5	/						

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately fine	medium	moderately fine
subsoil	moderately coarse	moderately coarse	moderately fine
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	very deep
c. Drainage:	Well drained	Poorly drained	Well drained
d. Exch. K:	topsoil medium	low	medium
subsoil low	very low	low	low
e. Total K2O:	topsoil medium	low	medium
subsoil high	low	low	very high
f. Avail. P:	method Bray I	Bray I	Bray I
topsoil very low	very high	very low	very low
subsoil very low	very low	very low	very low
g. Total P:	topsoil very high	low	very low
subsoil low	high	high	very low
h. CEC pH 7	topsoil high	high	low
subsoil medium	high	high	very low
i. Soil Reaction:	topsoil very strong acid	excessive acid	strong acid
subsoil strong acid	very strong acid	strong acid	strong acid
j. Al Sat.	topsoil very low	low	very low
subsoil very low	medium	medium	very low
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	150 cm	130 cm
p. Organic Matter :	7.2	43.4	4.2
q. TEB :	2.4	10.5	1.0
r. Total observations:	6	1	2

19. ALTITUDE: Maximum: 1700 m Minimum: 1200 m Range: 1500 m

20. PLAN/PROFILE: Dominant: linear and parallel No pronounced highs/lows

Included: linear and parallel > 60% of area flat-topped

21. L.U. DRAINAGE: a. Pattern: parallel b. density: Low

c. Variability: low

22. SLOPE: a. Steepness:flat b. Variability: Low

c. Length: long d. Variability: Low

e. Curvature: straight

23. SLOPE DISTR.: Valleybottoms: 20 %

Interfluves : 0-8%:80 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: very low b. Variability: Low

25. TERRAIN: Flat, slope <2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:

d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Flat tops, hydrandepts, 70%

-2- Depression, andaquepts, 20%

-3- Slightly sloping, dystrandeps, 10%

-4-

29. FRAGMENTATION: Valleys: Interfluves: Large blocks

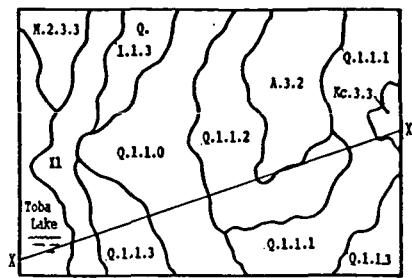
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 1 18.b: 2 18.c: 1

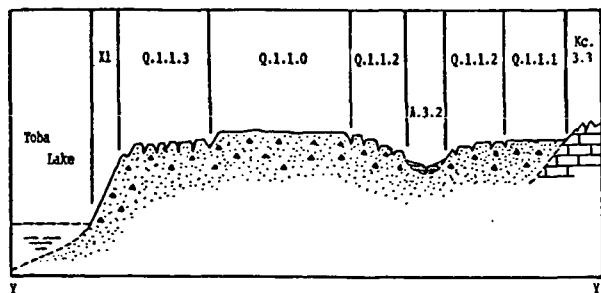
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 2 29: 3

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.1.1.2

2. MAP SHEET: 0618

3. AREA: 365 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Moderately dissected Toba Tuff plateau, acid tuffs, slopes 0-3%

7. SATELLITE SCENES : 129/58/08/08/85,

8. AERIAL PHOTOGRAPHS : 1:100.000 16a / -21 , 135 /8323-117, T2 /8323-153

9. RADAR : star-I/250/88/0618-1.3

10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

a. Weathering : Partial

b. Lithology : dacite

c. Formation : Qtz

12. WATER a. Quality : Fresh

b. Source : Rain, Deep wells

13. FISHERIES : Sungai (river)

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , bush, upland crops, horticultural crops, rainfed wetland rice, irrigated wetland rice (irigasi), coffee (kopi), reafforestation, towns, villages

Area used : 80 %

16. ACCELERATED EROSION

a. Occurrence : Localised

b. Evidence : Gullies

17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	hydrandepts	65 %	yes
Associated 1	dystrandepts	30 %	yes
Associated 2	andaquepts	5 %	yes

32. REPRESENTATIVE PROFILES:

inw/	/	/87/pt/0618/54/	/003/	iny/	/	/87/lh/0618/62/	/021/	
eot/	/301.5	/69/p	/0618/62/	/5 /	ign/	/	/87/tb/0618/61/	/005/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	moderately fine moderately fine	medium moderately coarse
b. Depth:	peatsoil -- mineralsoil very deep	-- very deep	-- very deep
c. Drainage:		Moderately well	Poorly drained
d. Exch. K:	topsoil low subsoil low	low medium	low very low
e. Total K2O:	topsoil very high subsoil very high	very high very high	low low
f. Avail. P:	method Bray I topsoil very high subsoil medium	Bray I very low very low	Bray I very high very low
g. Total P:	topsoil medium subsoil medium	very low very low	low high
h. CEC pH 7	topsoil medium subsoil low	low low	high high
i. Soil Reaction:	topsoil excessive acid subsoil excessive acid	very strong acid strong acid	excessive acid very strong acid
j. Al Sat.	topsoil low subsoil high	low very low	low medium
k. Al toxicity :	no	--	-- no
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	120 cm	150 cm
p. Organic Matter :	4.0	1.8	43.4
q. TEB :	1.8	1.6	0.5
r. Total observations:	1	1	1

19. ALTITUDE: Maximum: 1800 m Minimum: 1000 m Range: 1300 m

20. PLAN/PROFILE: Dominant: non-linear and random > 60% of area flat-topped  
Included: linear and random > 60% of area flat-topped21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Moderate  
c. Variability: low22. SLOPE: a. Steepness: flat b. Variability: Medium  
c. Length: moderate d. Variability: Medium  
e. Curvature: straight23. SLOPE DISTR.: Valleybottoms: 5 %  
Interfluves : 0-8%: 85 %, 9-25%: 10 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: low b. Variability: Low

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability: Low  
d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: narrow b. Variability: Low

28. LAND FACETS:  
-1- Flat tops, hydrandepts, 65%  
-2- Gently sloping parts, dystrandeps, 30%  
-3- Depressions, andaquepts, 5%  
-4-

29. FRAGMENTATION: Valleys: Interfluves: Large blocks

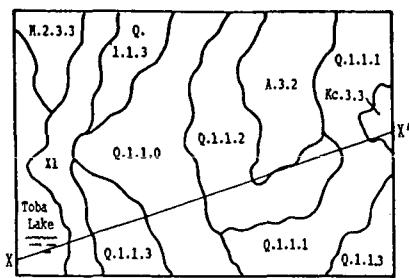
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 1 18.b: 2 18.c: 1

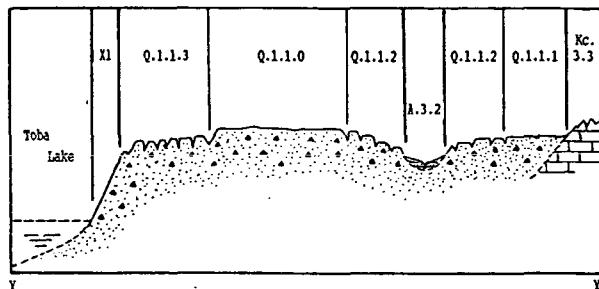
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.1.1.3

2. MAP SHEET: 0618

3. AREA: 166 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected Toba Tuff plateau, acid tuffs, slopes 0-3%

7. SATELLITE SCENES : 129/58/08/08/85, 128/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 T2 /8323-155, 16a / -027,

9. RADAR : star-I/250/88/0618-1,4

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

a. Weathering : Partial

b. Lithology : dacite

c. Formation : Qvt

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : Sungai (river)

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , bush, alang-alang, horticultural crops, upland crops, irrigated wetland rice (irigasi), reafforestation, towns, villages

Area used : 40 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Gullies

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	hydrandepts	65 %	yes
Associated 1	dystrandepts	30 %	yes
Associated 2	andaquepts	5 %	yes

## 32. REPRESENTATIVE PROFILES:

inw/	/	/87/mr/0618/32/	/015/	iny/	/	/87/mr/0618/32/	/026/	
eot/	/301.5	/69/p	/0618/62/	/5 /	iqn/	/	/87/tb/0618/32/	/005/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately fine	fine	medium
subsoil	moderately fine	medium	moderately coarse
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	extremely deep	very deep
c. Drainage:	Moderately well	Well drained	Poorly drained
d. Exch. K: topsoil	low	very low	low
subsoil	very low	very low	very low
e. Total K2O: topsoil	medium	high	low
subsoil	low	high	low
f. Avail. P: method	Bray I	Bray I	Bray I
topsoil	very low	very low	very high
subsoil	very low	very low	very low
g. Total P: topsoil	medium	very low	low
subsoil	low	very low	high
h. CEC pH 7 topsoil	medium	low	high
subsoil	high	low	high
i. Soil Reaction: topsoil	strong acid.	very strong acid	excessive acid
subsoil	strong acid	strong acid	very strong acid
j. Al Sat. topsoil	low	high	low
subsoil	high	high	medium
k. Al toxicity :	no	no	no
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	195 cm	150 cm
p. Organic Matter :	11.8	1.6	43.4
q. TEB :	0.4	1.1	10.6
r. Total observations:	1	2	1

19. ALTITUDE: Maximum: 1700 m Minimum: 1000 m Range: 1200 m

20. PLAN/PROFILE: Dominant: non-linear and random 40-60% of area flat-topped  
Included: linear and random 40-60% of area flat-topped21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high  
c. Variability: medium22. SLOPE: a. Steepness:flat b. Variability: Medium  
c. Length: moderate d. Variability: Medium  
e. Curvature: straight23. SLOPE DISTR.: Valleybottoms: 5 %  
Interfluves : 0-8%:75 %, 9-25%: 10 %, 25-55%: 10 %

24. RELIEF AMPLI.: a. Amplitude: low b. Variability: Medium

25. TERRAIN: Flat, slope &lt;2%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:  
d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: narrow b. Variability: Low

28. LAND FACETS: -1- Flat tops, hydrandepts, 65%

-2- Gently sloping, dystranddepts, 30%

-3- Valleys, depression, andaquepts, 5%

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Large blocks

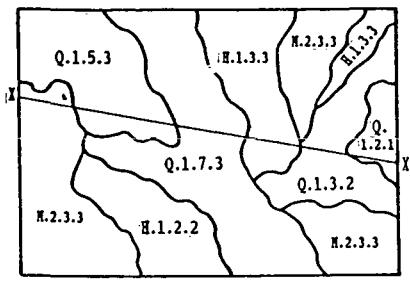
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 1 18.b: 2 18.c: 1

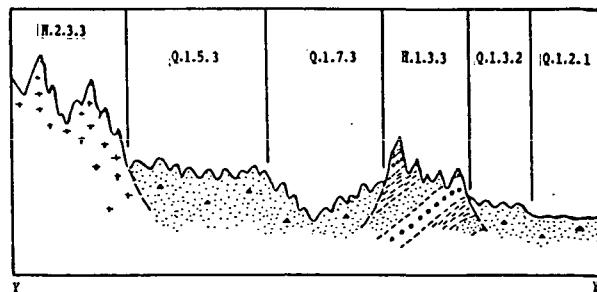
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 2 29: 2

31. ADDITIONAL NOTES:

MAP IMAGE:



CROSS SECTION:



1. LAND UNIT: Qd.1.2.1

2. MAP SHEET: 0618

3. AREA: 299 km<sup>2</sup>

4. OCCURENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Slightly dissected gently sloping Toba Tuff, acid tuffs, slopes 3-8%

7. SATELLITE SCENES : 128/58/08/08/85, 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 16a / -025, T2 / -141, t2 / 8323-147

9. RADAR : Star-I/250/88/0618-3,4

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

a. Weathering : Partial

b. Lithology : dacite

c. Formation : Qrt

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : Sungai (river)

14. RIVERS a. Floodrisk : None

b. Imundation: None

15. VEGETATION/LAND USE : , bush, horticultural crops, upland crops, irrigated wetland rice (irigasi), rainfed wetland rice, towns, villages

Area used : 70 %

## 16. ACCELERATED EROSION

a. Occurence : Common

b. Evidence : Various

## 17. SOIL GREAT GROUP

	Classification	% of area	Lab. checked
Dominant >50%	hydrandepts	70 %	yes
Associated 1	dystrandeps	30 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

inhw / /87/pt/0618/52/ /020/ iny / /87/mr/0618/32/ /017/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately coarse	moderately coarse	--
subsoil	moderately fine	moderately fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K: topsoil	low	low	--
subsoil	very low	very low	--
e. Total K2O: topsoil	low	very high	--
subsoil	very high	very high	--
f. Avail. P: method	Bray I	Bray I	
topsoil	very low	very low	--
subsoil	very low	very low	--
g. Total P:	topsoil	medium	low
subsoil	medium	very low	--
h. CEC pH 7	topsoil	very high	low
subsoil	high	low	--
i. Soil Reaction: topsoil	excessive acid	very strong acid	--
subsoil	very strong acid	strong acid	--
j. Al Sat. topsoil	very high	high	--
subsoil	medium	low	--
k. Al toxicity :	no	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	105 cm	150 cm	--
p. Organic Matter :	9.0	3.1	0.0
q. TEB :	0.4	0.7	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 2000 m Minimum: 1500 m Range: 1700 m

20. PLAN/PROFILE: Dominant: linear and parallel > 60% of area flat-topped  
Included: non-linear and random 40-60% of area flat-topped

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Low

c. Variability: low

22. SLOPE: a. Steepness:gently sloping b. Variability: Medium  
c. Length: moderate d. Variability: Medium

e. Curvature: straight

23. SLOPE DISTR.: Valleybottoms: 5 %

Interfluves : 0-8%:70 %, 9-25%: 20 %, 25-55%: 5 %

24. RELIEF AMPLI.: a. Amplitude: low b. Variability: Medium

25. TERRAIN: Undulating 2- 8%, 0-50 m

26. CREST/RIDGES: a. Shape: b. Length: c. Variability:

d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: b. Variability:

28. LAND FACETS: -1- Flat tops, hydrandepts, 70%

-2- Gently sloping, dystrandeps, 30%

-3-

-4-

29. FRAGMENTATION: Valleys: Interfluves: Medium blocks

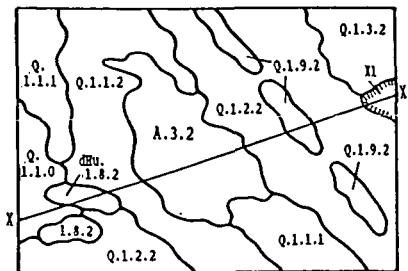
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 3 18.b: 2 18.c: 1

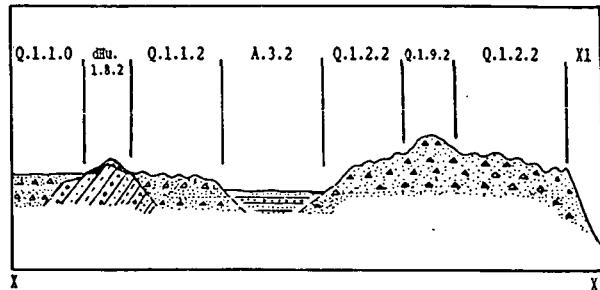
18.d-q: 3 19: 2 22: 2 23: 2 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.1.2.2

2. MAP SHEET: 0618

3. AREA: 1163 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Moderately dissected gently sloping Toba Tuff, acid tuffs, slopes 3-8%

7. SATELLITE SCENES : 129/58/08/08/85, 128/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 T2 /8323-141, 16A / -023, 14s /8319-117

9. RADAR : star-I/250/88/0618=3,4

## 10. PARENT MATERIAL

a. Weathering : Partial

b. Lithology : dacite

c. Formation : Qrt

## 12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

## 13. FISHERIES : Sungai (river)

## 14. RIVERS a. Floodrisk : None

b. Imundation: None

15. VEGETATION/LAND USE : moist primary submontane forest, bush, alang-alang, shifting cultivation, horticultural crops, upland crops, irrigated wetland rice (irigasi), coffee (kopi), tea (teh), towns, villages

Area used : 60 %

## 16. ACCELERATED EROSION

a. Occurrence : Localised

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	hydrandepts	70 %	yes
Associated 1	dystrandeps	20 %	yes
Associated 2	troporthods	10 %	yes

## 32. REPRESENTATIVE PROFILES:

inw/	/	/87/pt/0618/52/	/020/	iny/	/	/87/mr/0618/32/	/017/
sot/	/	/87/pt/0618/54/	/15 /				

## 18. SOIL CHARACTERISTICS

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil moderately coarse subsoil moderately fine	moderately coarse moderately fine	coarse moderately coarse
b. Depth:	peatsoil mineralsoil	-- very deep	-- moderately deep
c. Drainage:		Well drained	Well drained
d. Exch. K:	topsoil low subsoil very low	low very low	very low very low
e. Total K2O:	topsoil low subsoil very high	very high very high	very low low
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	Bray I very low very low
g. Total P:	topsoil medium subsoil medium	medium very low	very low very low
h. CEC pH 7	topsoil medium subsoil high	low low	low medium
i. Soil Reaction:	topsoil excessive acid subsoil very strong acid	very strong acid strong acid	excessive acid very strong acid
j. Al Sat.	topsoil very high subsoil medium	high low	high high
k. Al toxicity :	no	no	no
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	105 cm	150 cm	70 cm
p. Organic Matter :	9.9	3.1	6.5
q. TEB :	0.4	0.7	1.3
r. Total observations:	11	3	1

19. ALTITUDE: Maximum: 1550 m Minimum: 925 m Range: 1200 m

20. PLAN/PROFILE: Dominant: linear and random > 60% of area flat-topped

Included: linear and parallel < 40% of area flat-topped

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Moderate  
c. Variability: low

22. SLOPE: a. Steepness: gently sloping b. Variability: Medium  
c. Length: moderate d. Variability: Medium  
e. Curvature: straight

23. SLOPE DISTR.: Valleybottoms: 10 %  
Interfluves : 0-8%:60 %, 9-25%: 30 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Medium

25. TERRAIN: Undulating 2- 8%, 0-50 m

26. CREST/RIDGES: a. Shape: Level b. Length: Short c. Variability: Low  
d. Width: narrow e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Flat tops, hydrandepts, 60%

-2- Gently sloping, dystrandeps, 30%

-3- Small depre. on slopes, troporthods, 10%

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Small blocks

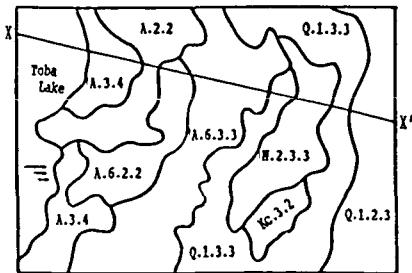
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 1 18.b: 1 18.c: 1

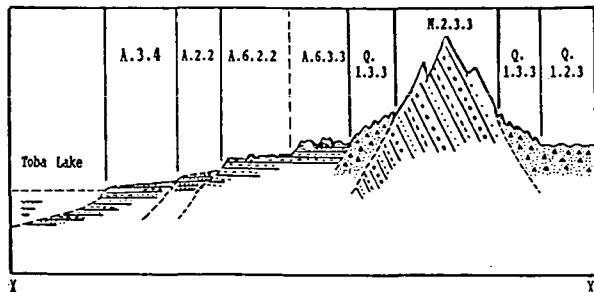
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 3 29: 3

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.1.2.3
2. MAP SHEET: 0618
3. AREA: 572 km2
4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%
5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final
6. LAND UNIT DESCRIPTION: Strongly Dissected gently sloping Toba Tuff, acid tuffs, slopes 3-8%.
7. SATELLITE SCENES : 129/58/08/08/85, 128/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 RT02/8323-137, RT02/8323-145, RT02/8323-155
9. RADAR : star-I/250/88/0618-134
10. PARENT MATERIAL
  - a. Weathering : Partial
  - b. Lithology : dacite
  - c. Formation : Qvt
11. ROCK OUTCROP: 0 %
12. WATER
  - a. Quality : Fresh
  - b. Source : Rain, Perennial River
13. FISHERIES : Sungai (river)
14. RIVERS
  - a. Floodrisk : None
  - b. Imundation: None
15. VEGETATION/LAND USE : moist primary submontane forest, bush, shifting cultivation, horticultural crops, upland crops, irrigated wetland rice (irigasi), reafforestation, towns, villages
 

Area used : 50 %
16. ACCELERATED EROSION
  - a. Occurrence : Extensive
  - b. Evidence : Gullies
17. SOIL GREAT GROUP :
 

	Classification	% of area	Lab. checked
Dominant >50%	hydrandepts	60 %	yes
Associated 1	dystrandepts	30 %	yes
Associated 2	troporthods	10 %	yes
32. REPRESENTATIVE PROFILES:
 

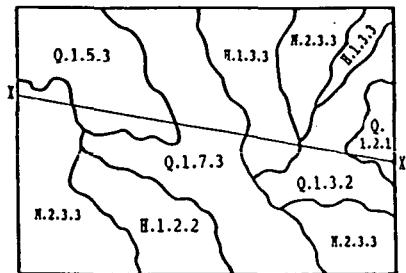
inw/	/	/87/pt/0618/54/	/2 /	iny/	/	/87/md/0618/34/	/30 /
sot/	/	/88/pt/0618/54/	/15 /				

**18. SOIL CHARACTERISTICS**

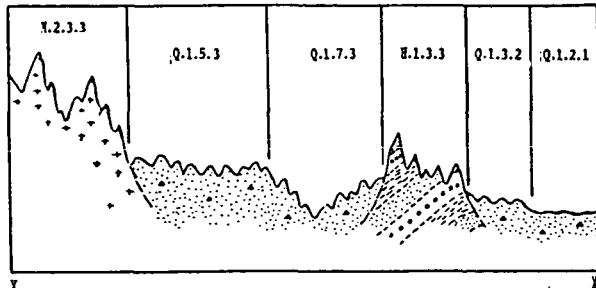
Properties	Dominant > 50%	Associated 1	Associated 2
a. Texture: topsoil	fine	moderately coarse	coarse
subsoil	fine	coarse	moderately coarse
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	moderately deep
c. Drainage:	Well drained	Well drained	Well drained
d. Exch. K:	topsoil low	medium	very low
subsoil low	low	very low	very low
e. Total K2O:	topsoil very high	very high	very low
subsoil very high	very high	low	Bray I
f. Avail. P:	method Bray I	Bray I	very low
topsoil very low	high	very low	very low
subsoil very low	high	very low	medium
g. Total P:	topsoil low	low	very low
subsoil low	low	very low	very low
h. CEC pH 7	topsoil low	low	low
subsoil low	very low	moderate	excessive acid
i. Soil Reaction: topsoil	strong acid	moderately acid	very strong acid
subsoil	very strong acid	moderately acid	excessive acid
j. Al Sat.	topsoil high	very low	high
subsoil medium	very low	high	high
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	110 cm	70 cm
p. Organic Matter :	1.7	2.1	6.5
q. IEB :	1.2	2.5	1.3
r. Total observations:	10	4	1

19. ALTITUDE: Maximum: 1500 m Minimum: 900 m Range: 1200 m
20. PLAN/PROFILE: Dominant: non-linear and random 40-60% of area crested/peaked  
Included: non-linear and random 40-60% of area flat-topped
21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high
22. SLOPE: a. Steepness: gently sloping b. Variability: Medium
- c. Length: moderate d. Variability: Medium
- e. Curvature: straight
23. SLOPE DISTR.: Valleybottoms: 10 %  
Interfluves : 0-8%:60 %, 9-25%: 30 %, 25-55%: 0 %
24. RELIEF AMPLI.: a. Amplitude: low b. Variability: Medium
25. TERRAIN: Undulating 2- 8%, 0-50 m
26. CREST/RIDGES: a. Shape: Level b. Length: Moderately long c. Variability: Medium
- d. Width: narrow e. Variability: Low
27. VALLEY FLOOR: a. Width: very narrow b. Variability:
28. LAND FACETS: -1- Flat tops and crests, hydrandepts, 60%  
-2- Sloping parts, dystrandeps, 30%  
-3- Small depres. on slope, troporthods, 10%  
-4-
29. FRAGMENTATION: Valleys: Small blocks Interfluves: Large blocks
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible
- 10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 1 18.b: 1 18.c: 1  
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 3 29: 3
31. ADDITIONAL NOTES: sot/Troporthods, extrapolation from landunit Qd.1.2.2

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.1.3.2

2. MAP SHEET: 0618

3. AREA: 379 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final .

6. LAND UNIT DESCRIPTION: Moderately dissected sloping Toba Tuff, acid tuffs, slope 8-15%

7. SATELLITE SCENES : 129/58/08/08/85, / / / /

8. AERIAL PHOTOGRAPHS : 1:100.000 12b / -002, T2 /8323-139, 145 /8319-115

9. RADAR : STAR-I/250/88/0618-134

## 10. PARENT MATERIAL

## 11. ROCK OUTCROP: %

a. Weathering : Partial

b. Lithology : dacite

c. Formation : Qvt

## 12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

## 13. FISHERIES : Sungai (river)

## 14. RIVERS a. Floodrisk : None

b. Imundation: None

15. VEGETATION/LAND USE : , bush, alang-alang, shifting cultivation, horticultural crops, upland crops, irrigated wetland rice (irigasi), rainfed wetland rice, reafforestation, towns, villages

rea used : 50 %

## 16. WIND EROSION

a. Occurrence : Common

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystrandeps	60 %	yes
Associated 1	hydrandeps	40 %	yes
Associated 2		%	

## 32. REPRESENTATIVE PROFILE :

iny/ / /87/KR/0618/52/ /9 /	iny/ / /87/GD/0618/ / /28 /
inw/ / /87/PT/0618/63/ /8 /	inw/ / /87/KR/0618/52/ /16 /
iny/ / /87/JH/0618/ / /27 /	

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
<b>a. Texture:</b>	<b>topsoil</b> moderately fine	medium	--
	<b>subsoil</b> moderately fine	moderately fine	--
<b>b. Depth:</b>	<b>peatsoil</b> --	--	--
	<b>mineralsoil</b> very deep	very deep	--
<b>c. Drainage:</b>	Well drained	Well drained	--
<b>d. Exch. K:</b>	<b>topsoil</b> low	medium	--
	<b>subsoil</b> very low	low	--
<b>e. Total K2O:</b>	<b>topsoil</b> very high	medium	--
	<b>subsoil</b> very high	medium	--
<b>f. Avail. P:</b>	<b>method</b> Bray I	Bray I	
	<b>topsoil</b> very low	very low	--
	<b>subsoil</b> very low	very low	--
<b>g. Total P:</b>	<b>topsoil</b> low	medium	--
	<b>subsoil</b> very low	medium	--
<b>h. CEC pH 7</b>	<b>topsoil</b> medium	high	--
	<b>subsoil</b> low	high	--
<b>i. Soil Reaction:</b>	<b>topsoil</b> very strong acid	strong acid	--
	<b>subsoil</b> strong acid	strong acid	--
<b>j. Al Sat.</b>	<b>topsoil</b> very high	low	--
	<b>subsoil</b> medium	very low	--
<b>k. Al toxicity :</b>	--	--	--
<b>l. Acid sulph. pot.:</b>	--	--	--
<b>m. Salinity :</b>	salt free	salt free	--
<b>n. Other Toxicity:</b>	--	--	--
<b>o. Root obstr. layer :</b>	152 cm	120 cm	--
<b>p. Organic Matter :</b>	6.1	14.1	0.0
<b>q. TEB :</b>	0.6	1.1	0.0
<b>r. Total observations:</b>	3	2	0

**19. ALTITUDE:** Maximum: 1425 m Minimum: 950 m Range: 1000 m**20. PLAN/PROFILE:** Dominant: non-linear and random 40-60% of area flat-topped  
Included: non-linear and random < 40% of area flat-topped**21. L.U. DRAINAGE:** a. Pattern: dendritic b. density: Moderate  
c. Variability: low**22. SLOPE:** a. Steepness: sloping b. Variability: Medium  
c. Length: moderate d. Variability: Medium  
e. Curvature: concave**23. SLOPE DISTR.:** Valleybottoms: 5 %  
Interfluves : 0-8%:35 %, 9-25%: 60 %, 25-55%: 0 %**24. RELIEF AMPLI.:** a. Amplitude: low b. Variability: Medium**25. TERRAIN:** Rolling 9-15%, 0-50 m**26. CREST/RIDGES:** a. Shape: Level b. Length: Short c. Variability: Medium

d. Width: narrow e. Variability: Low

**27. VALLEY FLOOR:** a. Width: very narrow b. Variability: Low**28. LAND FACETS:** -1- Flattop & valley floor, hydrandepts, 40%

-2- Slopes, dystrandeps, 60%

-3-

-4-

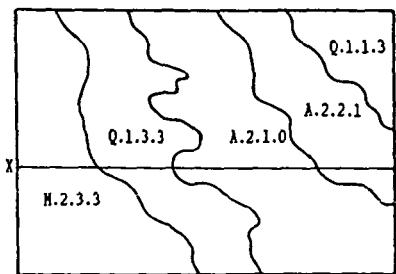
**29. FRAGMENTATION:** Valleys: Interfluves: Medium blocks**30. RELIABILITY:** 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 1 18.c: 1

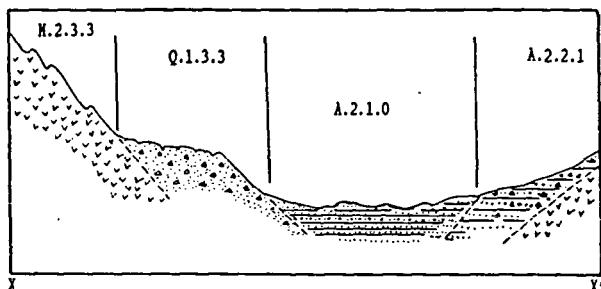
18.d-q: 2 19: 2 22: 2 23: 2 24: 1 28: 3 29: 2

**31. ADDITIONAL NOTES:**

MAP IMAGE:



CROSS SECTION:



1. LAND UNIT: Qd.1.3.3      2. MAP SHEET: 0618      3. AREA: 351 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 22/03/89      Status: Final
6. LAND UNIT DESCRIPTION: Strongly dissected sloping Toba Tuff, acid tuffs, slope 8-15%
7. SATELLITE SCENES : 129/58/08/08/85, 128/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000      11g / -026, 16a / -026, 135 / 8323-115
9. RADAR : STAR-I/250/88/0618-136
10. PARENT MATERIAL      11. ROCK OUTCROP: %
- a. Weathering : Partial
  - b. Lithology : dacite
  - c. Formation : Qvt
12. WATER a. Quality : Fresh  
b. Source : Rain, Perennial River
13. FISHERIES : None
14. RIVERS a. Floodrisk : None  
b. Imundation: None
15. VEGETATION/LAND USE : pinus forests, bush, shifting cultivation, upland crops, horticultural crops, irrigated wetland rice (irigasi), rainfed wetland rice, towns, villages  
Area used : 50 %
16. ACCELERATED EROSION
- a. Occurrence : Extensive
  - b. Evidence : Gullies
- 
17. SOIL GREAT GROUP :
- |               | Classification | % of area | Lab. checked |
|---------------|----------------|-----------|--------------|
| Dominant >50% | dystandepts    | 65 %      | yes          |
| Associated 1  | hydrandepts    | 35 %      | yes          |
| Associated 2  |                | %         |              |
- 
32. REPRESENTATIVE PROFILES:
- | iny/ / | /87/MD/0618/64/ /8 /  | iny/ / | /87/MR/0618/32/ /12 / |
|--------|-----------------------|--------|-----------------------|
| inw/ / | /87/PT/0618/33/ /61 / | inw/ / | /87/PT/0618/ / /63 /  |
| iny/ / | /87/GD/0618/ / /27 /  |        |                       |

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil moderately fine subsoil moderately fine	moderately coarse moderately coarse	-- --
b. Depth:	peatsoil -- mineralsoil very deep	-- very deep	-- --
c. Drainage:		Well drained	Well drained
d. Exch. K:	topsoil low subsoil very low	low low	-- --
e. Total K2O:	topsoil high subsoil very high	medium very high	-- --
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	-- --
g. Total P:	topsoil low subsoil very low	very low very low	-- --
h. CEC pH 7	topsoil high subsoil low	low low	-- --
i. Soil Reaction:	topsoil very strong acid subsoil very strong acid	strong acid strong acid	-- --
j. Al Sat.	topsoil very high subsoil very low	very low very low	-- --
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	125 cm	--
p. Organic Matter :	6.6	8.6	0.0
q. TEB :	0.3	0.6	0.0
r. Total observations:	3	2	0

19. ALTITUDE: Maximum: 1450 m Minimum: 1000 m Range: 1200 m

20. PLAIN/PROFILE: Dominant: non-linear and random 40-60% of area flat-topped  
Included: non-linear and random > 60% of area crested/peaked21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high  
c. Variability: medium22. SLOPE: a. Steepness: sloping b. Variability: Medium  
c. Length: short d. Variability: Medium  
e. Curvature: convex23. SLOPE DISTR.: Valleybottoms: 10 %  
Interfluves : 0-8%: 25 %, 9-25%: 65 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Medium

25. TERRAIN: Rolling 9-15%, 0-50 m

26. CREST/RIDGES: a. Shape: Level b. Length: Short c. Variability: Medium  
d. Width: narrow e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Falttop &amp; valley floor, hydrandepts, 35%

-2- Slopes, dystrandeps, 65%

-3-

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Small blocks

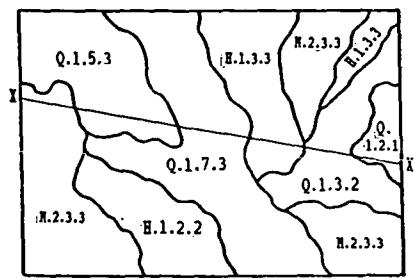
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 1 18.c: 1

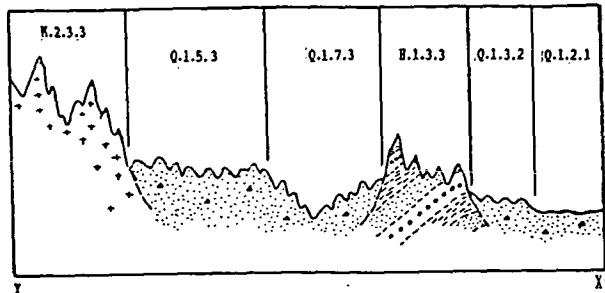
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 3 29: 3

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.1.5.3

2. MAP SHEET: 0618

3. AREA: 259 km2

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected gently sloping valley fills of the Toba tuff, acid tuffs, slope 3-8%

7. SATELLITE SCENES : 129/58/08/08/85, / / / /

8. AERIAL PHOTOGRAPHS : 1:100.000 T2 /8323-133, 11G / -022,

9. RADAR : STAR-I/250/88/0618-134

10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : Partial

b. Lithology : dacite

c. Formation : Qvt

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : Sungai (river)

14. RIVERS a. Floodrisk : None

b. Imundation: None

15. VEGETATION/LAND USE : , bush, alang-alang, shifting cultivation, horticultural crops, upland crops, rubber (karet)

Area used : 50 %

16. ACCELERATED EROSION

a. Occurrence : Common

b. Evidence : Various

17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystrandepts	80 %	yes
Associated 1	hydrandepts	20 %	yes
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

iny/ /	/87/KR/618/32/ /045/	inw/ /	/87/TB/0618/22/ /084/
iny/ /	/87/GD/0618/ / /20 /	inw/ /	/87/LH/0618/ / /88 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	coarse coarse	-- --
b. Depth:	peatsoil -- mineralsoil extremely deep	-- very deep	-- --
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil very low subsoil very low	very low very low	-- --
e. Total K2O:	topsoil high subsoil high	very high very high	-- --
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	-- --
g. Total P:	topsoil very low subsoil very low	low very low	-- --
h. CEC pH 7	topsoil low subsoil low	low low	-- --
i. Soil Reaction:	topsoil very strong acid subsoil very strong acid	strong acid slightly acid	-- --
j. Al Sat.	topsoil very high subsoil very high	very low very low	-- --
k. Al toxicity :	no	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	196 cm	120 cm	--
p. Organic Matter :	1.9	8.5	0.0
q. IEB :	0.2	0.8	0.0
r. Total observations:	2	2	0

**19. ALTITUDE:** Maximum: 1000 m Minimum: 700 m Range: 700 m

**20. PLAN/PROFILE:** Dominant: non-linear and random > 60% of area flat-topped  
Included:

**21. L.U. DRAINAGE:** a. Pattern: dendritic b. density: Mod. high  
c. Variability: medium

**22. SLOPE:** a. Steepness: gently sloping b. Variability: Medium  
c. Length: long d. Variability: Medium

**23. SLOPE DISTR.:** Valleybottoms: 20 % Interfluves : 0-8%: 80 %, 9-25%: 0 %, 25-55%: 0 %

**24. RELIEF AMPLI.:** a. Amplitude: low b. Variability: Medium

**25. TERRAIN:** Undulating 2- 8%, 0-50 m

**26. CREST/RIDGES:** a. Shape: b. Length: c. Variability:  
d. Width: e. Variability:

**27. VALLEY FLOOR:** a. Width: narrow b. Variability: Low

**28. LAND FACETS:** -1- Gently sloping, dystrandeps, 80%

-2- Valley floor, hydrandeps, 20%

-3-

-4-

**29. FRAGMENTATION:** Valleys: Interfluves:

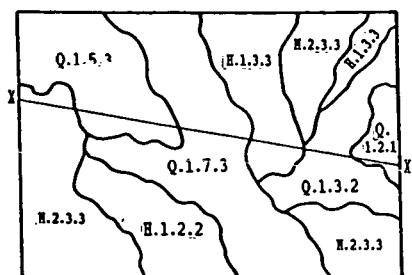
**30. RELIABILITY:** 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 2 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

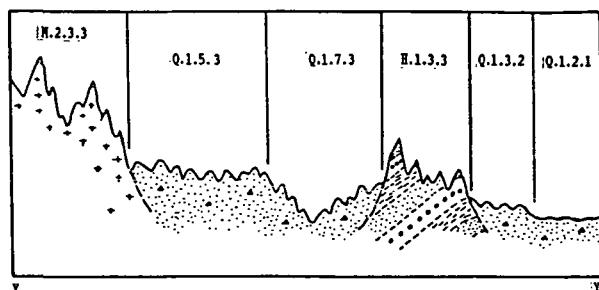
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

**31. ADDITIONAL NOTES:**

MAP IMAGE:



CROSS SECTION:



1. **LAND UNIT:** Qd.1.7.3      2. **MAP SHEET:** 0618      3. **AREA:** 421 km<sup>2</sup>
4. **OCCURRENCE by PROVINCE:** Sumatera Utara: 99%
5. **STATUS IDENTIFIERS :** Updated by: DR      edit date: 22/03/89      Status: Final
6. **LAND UNIT DESCRIPTION:** Strongly dissected sloping valleys fills of the Toba Tuff, acid tuffs, slope 8-15%
7. **SATELLITE SCENES :** 129/58/08/08/85, 129/59/08/08/85
8. **AERIAL PHOTOGRAPHS :** 1:100.000 T2 /8323-133, 11I / -111, 16G / -022
9. **RADAR :** star-I/250/88/0618-4,6
10. **PARENT MATERIAL**
- a. Weathering : Partial
  - b. Lithology : dacite
  - c. Formation : Qvt
11. **ROCK OUTCROP:** 0 %
12. **WATER**
- a. Quality : Fresh
  - b. Source : Rain, Perennial River
13. **FISHERIES** : None
14. **RIVERS**
- a. Floodrisk : None
  - b. Inundation: None
15. **VEGETATION/LAND USE :** secondary forest, bush, alang-alang, upland crops, coffee (kopi), pinus (damar), towns, villages
- Area used : 70 %
16. **ACCELERATED EROSION**
- a. Occurrence : Extensive
  - b. Evidence : Gullies

**17. SOIL GREAT GROUP :**

	Classification	% of area	Lab. checked
Dominant >50%	dystrandeps	90 %	yes
Associated 1	andaquepts	10 %	yes
Associated 2		%	

**32. REPRESENTATIVE PROFILES:**

iny/ /	/87/kr/0618/22/	/040/	inq/ /	/87/pt/0618/53/	/006/
iny/ /	/87/pt/0618/ /	/5 /	iny/ /	/87/jh/0618/ /	/29 /
iny/ /	/87/mr/0618/ /	/23 /	iny/ /	/87/kn/0618/ /	/18 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil moderately fine subsoil moderately fine	fine fine	-- --
b. Depth:	peatsoil -- mineralsoil extremely deep	-- very deep	--
c. Drainage:	Well drained	Moderately well	--
d. Exch. K:	topsoil very low subsoil very low	medium medium	-- --
e. Total K2O:	topsoil medium subsoil medium	very high very high	-- --
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I high medium	-- -- --
g. Total P:	topsoil very low subsoil very low	medium medium	-- --
h. CEC pH 7	topsoil low subsoil low	low low	-- --
i. Soil Reaction:	topsoil strong acid subsoil strong acid	moderately acid slightly acid	-- --
j. Al Sat.	topsoil high subsoil high	very low very low	-- --
k. Al toxicity :	no	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	163 cm	120 cm	--
p. Organic Matter :	1.7	3.7	0.0
q. TEB :	0.6	7.3	0.0
r. Total observations:	6	1	0

19. ALTITUDE: Maximum: 1200 m Minimum: 725 m Range: 800 m

20. PLAN/PROFILE: Dominant: non-linear and random > 60% of area crested/peaked  
Included: non-linear and random < 40% of area flat-topped21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high  
c. Variability: medium22. SLOPE: a. Steepness: sloping b. Variability: Medium  
c. Length: moderate d. Variability: Medium  
e. Curvature: straight23. SLOPE DISTR.: Valleybottoms: 10 %  
Interfluves : 0-8%:25 %, 9-25%: 60 %, 25-55%: 5 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Medium

25. TERRAIN: Rolling 9-15%, 0-50 m

26. CREST/RIDGES: a. Shape: Irregular b. Length: Moderately long c. Variability: Medium  
d. Width: moderate e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS:  
-1- Very disc sloping part, dystrandeps, 90%  
-2- Valley floor (bottoms), andaquepts, 10%  
-3-  
-4-

29. FRAGMENTATION: Valleys: None Interfluves: Small blocks

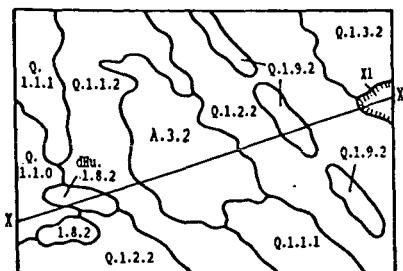
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 2 14.b: 1 17: 2 18.a: 1 18.b: 2 18.c: 2

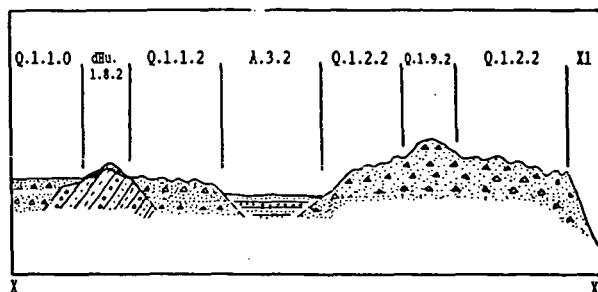
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.1.9.2

2. MAP SHEET: 0618

3. AREA: 39 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Moderately dissected elongated ridges along faults, acid tuffs, slopes 16-25%

7. SATELLITE SCENES : 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 11G / -026, 11G / -032, 12D / -064

9. RADAR : Star-I/250/88/0618-346

## 10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : Partial

b. Lithology : dacite

c. Formation : Qvt

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , bush, alang-alang, upland crops, horticultural crops, towns, villages

Area used : 40 %

## 16. ACCELERATED EROSION

a. Occurrence : Common

b. Evidence : Landslips

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystrandeps	99 %	yes
Associated 1		%	
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

iny/ / 87/kr/0618/52/ /7 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine.	-- --	-- --
b. Depth:	peatsoil -- mineralsoil very deep	-- --	-- --
c. Drainage:		Excessively drained	--
d. Exch. K:	topsoil medium subsoil low	-- --	-- --
e. Total K2O:	topsoil very high subsoil very high	-- --	-- --
f. Avail. P:	method Bray I topsoil very low subsoil very low	-- -- --	-- -- --
g. Total P:	topsoil very low subsoil very low	-- --	-- --
h. CEC pH 7	topsoil low subsoil low	-- --	-- --
i. Soil Reaction:	topsoil strong acid subsoil strong acid	-- --	-- --
j. Al Sat.	topsoil medium subsoil medium	-- --	-- --
k. Al toxicity :	no	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	157 cm	--	--
p. Organic Matter :	5.0	0.0	0.0
q. TEB :	1.9	0.0	0.0
r. Total observations:	1	0	0

19. ALTITUDE: Maximum: 1950 m Minimum: 1500 m Range: 1600 m

20. PLAN/PROFILE: Dominant: linear and parallel 40-60% of area flat-topped  
Included:21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high  
c. Variability: medium22. SLOPE: a. Steepness:mod. steep b. Variability: Medium  
c. Length: short d. Variability: Medium  
e. Curvature: convex23. SLOPE DISTR.: Valleybottoms: 5 %  
Interfluves : 0-8%:0 %, 9-25%: 95 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Low

25. TERRAIN: hillocky &gt;16%, 0-50 m

26. CREST/RIDGES: a. Shape: Undulating b. Length: Moderately long c. Variability: Low  
d. Width: moderate e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS:  
-1- Ridges & valley side, dystrandeps, 95%  
-2- valley floor (bottoms), dystrandeps, 5%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves: Small blocks

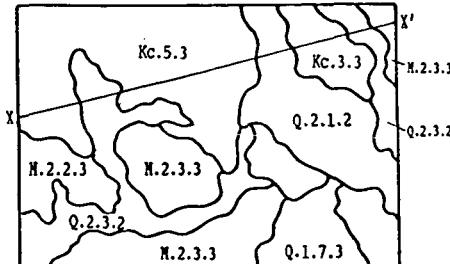
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

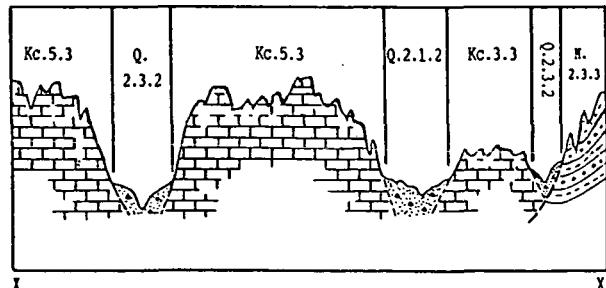
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.2.1.2

2. MAP SHEET: 0618

3. AREA: 194 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 93%, DI. Aceh: 6%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Moderately dissected gently sloping foot slopes of Toba tuff, acid tiffs, slope 3-8%

7. SATELLITE SCENES : 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 T2 /8323-131, 12D / -072

9. RADAR : Star-I/250/88/0618-4,6

10. PARENT MATERIAL : 11. ROCK OUTCROP: 0 %

a. Weathering : Partial

b. Lithology : dacite

c. Formation : Qvt

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , bush, alang-alang, shifting cultivation, upland crops, rainfed wetland rice, towns, villages

Area used : 75 %

16. ACCELERATED EROSION

a. Occurrence : Common

b. Evidence : Gullies

17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	75 %	yes
Associated 1	hapludults	25 %	yes
Associated 2		%	

32. REPRESENTATIVE PROFILES:

ity/ / 87/pt/0618/53/ /016/ uda/ / 87/mr/0618/64/ /6 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	fine	fine	--
subsoil	fine	fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	extremely deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil high subsoil medium	medium low	--
e. Total K2O:	topsoil very high subsoil very high	very high very high	--
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	--
g. Total P:	topsoil low subsoil very low	very low very low	--
h. CEC pH 7	topsoil low subsoil low	low low	--
i. Soil Reaction: topsoil	moderately acid	very strong acid	--
subsoil	moderately acid	strong acid	--
j. Al Sat.	topsoil very low subsoil very low	medium high	--
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	130 cm	200 cm	--
p. Organic Matter :	1.4	3.4	0.0
q. TEB :	5.8	0.9	0.0
r. Total observations:	2	1	0

19. ALTITUDE: Maximum: 700 m Minimum: 300 m Range: 400 m

20. PLAN/PROFILE: Dominant: non-linear and random < 40% of area flat-topped  
Included: non-linear and random < 40% of area crested/peaked

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Moderate

c. Variability: medium

22. SLOPE: a. Steepness: gently sloping b. Variability: Low  
c. Length: long d. Variability: Medium

e. Curvature: compound

23. SLOPE DISTR.: Valleybottoms: 5 %

Interfluves : 0-8%: 85 %, 9-25%: 10 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Medium

25. TERRAIN: Undulating 2- 8%, 0-50 m

26. CREST/RIDGES: a. Shape: b. Length: c. Variability:

d. Width:

e. Variability:

27. VALLEY FLOOR: a. Width: narrow b. Variability: Low

28. LAND FACETS: -1- Gently sloping, hapludults, 20%

-2- Flat and rounded top, dystropepts, 75%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves: Large blocks

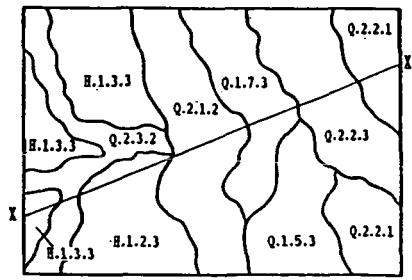
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

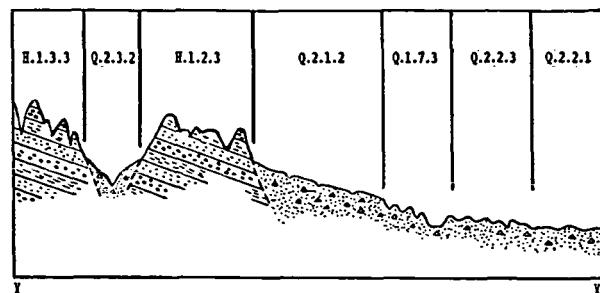
18.d-q: 2 19: 2 22: 1 23: 2 24: 2 28: 3 29: 3

31. ADDITIONAL NOTES:

MAP IMAGE:



CROSS SECTION:



1. LAND UNIT: Qd.2.2.3

2. MAP SHEET: 0618

3. AREA: 32 km<sup>2</sup>

4. OCCURENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 22/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected plain and fans Toba Tuff, acid tuffs, slopes 0-3%

7. SATELLITE SCENES : 129/59/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 10c / -056, 11G / -022

9. RADAR : star-I/250/88/0618-1

## 10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : Partial

b. Lithology : dacite

c. Formation : Qvt

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : Sungai (river)

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : secondary forest, bush, alang-alang, upland crops, horticultural crops, rainfed wetland rice, towns, villages

Area used : 40 %

## 16. ACCELERATED EROSION

a. Occurrence : Localised

b. Evidence : Gulleys

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	65 %	yes
Associated 1	tropaquepts	30 %	yes
Associated 2	kanhapludults	5 %	yes

## 32. REPRESENTATIVE PROFILES:

ity/	/301.9	/69/p	/0618/53/	/9 /	iqt/	/	/88/pt/0618/51/	/94 /
uda/	/301.14	/69/p	/0618/42/	/14 /				

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	fine fine	moderately fine fine
b. Depth:	peatsoil -- mineralsoil very deep	-- very deep	deep
c. Drainage:	Well drained	Poorly drained	Well drained
d. Exch. K:	topsoil -- subsoil --	medium low	-- --
e. Total K2O:	topsoil very high subsoil very high	very high very high	medium medium
f. Avail. P:	method topsoil -- subsoil --	Bray I medium medium	-- --
g. Total P:	topsoil low subsoil very low	very low medium	very low very low
h. CEC pH 7	topsoil -- subsoil --	medium high	-- --
i. Soil Reaction:	topsoil moderately acid subsoil strong acid	very strong acid very strong acid	strong acid strong acid
j. Al Sat.	topsoil -- subsoil --	very low very low	-- --
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	120 cm	120 cm
p. Organic Matter :	0.0	11.1	0.0
q. TEB :	0.0	10.3	0.0
r. Total observations:	2	1	3

19. ALTITUDE: Maximum: 175 m Minimum: 100 m Range: 150 m

20. PLAN/PROFILE: Dominant: linear and random 40-60% of area flat-topped

Included: linear and random &lt; 40% of area crested/peaked

21. L.U. DRAINAGE: a. Pattern: parallel b. density: Mod. high

c. Variability: medium

22. SLOPE: a. Steepness:gently sloping b. Variability: Low

c. Length: moderate d. Variability: Medium

e. Curvature: straight

23. SLOPE DISTR.: Valleybottoms: 20 %

Interfluves : 0-8%:80 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: low b. Variability: Low

25. TERRAIN: Undulating 2- 8%, 0-50 m

26. CREST/RIDGES: a. Shape: b. Length: c. Variability:

d. Width:

e. Variability:

27. VALLEY FLOOR: a. Width: very narrow b. Variability:

28. LAND FACETS: -1- Fan head &amp; upper slope, dystropepts, 65%

-2- Slightly concave plain, tropaquepts, 30%

-3- Gently sloping mid fan, hapludults, 5%

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Small blocks

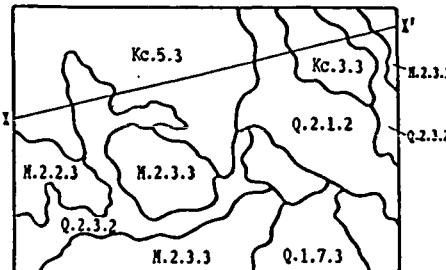
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 1

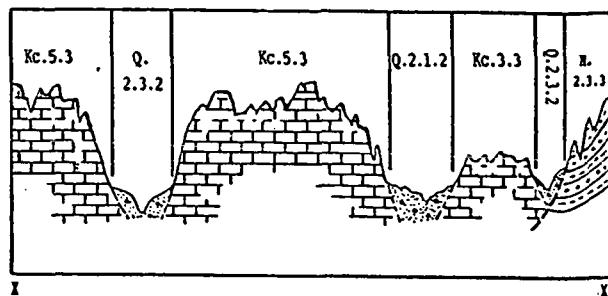
18.d-q: 2 19: 2 22: 1 23: 2 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Qd.2.3.2

2. MAP SHEET: 0618-

3. AREA: 301 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: DI Aceh: 7%, Sumatera Utara: 93%

5. STATUS IDENTIFIERS : Updated by: edit date: 05/01/89 Status: Final

6. LAND UNIT DESCRIPTION: Moderately dissected infilled river valley, acid tuff, slopes 3-8%.

7. SATELLITE SCENES : 129/59/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 11G / -38 , 12G / -64 , 11G / -26

9. RADAR : Star-I/250/88/0618-3,4

10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : High

b. Lithology : dacite

c. Formation : Qvt

12. WATER a. Quality : Fresh

b. Source : Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: Not known

15. VEGETATION/LAND USE : , bush, alang-alang, upland crops, rubber (karet)

Area used : 20 %

16. ACCELERATED EROSION

a. Occurrence : Localised

b. Evidence : Various

17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	humitropepts	55 %	yes
Associated 1	dystropepts	40 %	yes
Associated 2	hapludox	5 %	yes

32. REPRESENTATIVE PROFILES:

ith/ /	/87/TB/0618/51/	/15 /	ity/ /	/87/KR/0618/24/	/36 /
odh/ /	/87/PT/0618/53/	/7 /			

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	medium	fine	fine
subsoil	fine	fine	fine
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	extremely deep	very deep
c. Drainage:	Well drained	Well drained	Well drained
d. Exch. K: topsoil	low	low	medium
subsoil	very low	very low	low
e. Total K2O: topsoil	very high	very high	very high
subsoil	very high	very high	high
f. Avail. P: method	Bray I	Bray I	Bray I
topsoil	very low	very low	very low
subsoil	very low	very low	very low
g. Total P:	topsoil	low	low
subsoil	very low	very low	very low
h. CEC pH 7	topsoil	low	low
subsoil	low	medium	low
i. Soil Reaction: topsoil	excessive acid	very strong acid	excessive acid
subsoil	very strong acid	very strong acid	very strong acid
j. Al Sat.	topsoil	high	medium
subsoil	low	high	low
k. Al toxicity :	no	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	150 cm	160 cm	120 cm
p. Organic Matter :	4.0	3.2	1.9
q. TEB :	1.3	0.5	1.1
r. Total observations:	1	1	1

19. ALTITUDE: Maximum: 500 m Minimum: 350 m Range: 400 m

20. PLAN/PROFILE: Dominant: non-linear and random 40-60% of area flat-topped  
Included: non-linear and random > 60% of area flat-topped

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Moderate

c. Variability: low

22. SLOPE: a. Steepness: gently sloping b. Variability: High  
c. Length: long d. Variability: Medium

e. Curvature: convex

23. SLOPE DISTR.: Valleybottoms: 5 %

Interfluves : 0-8%:60 %, 9-25%: 20 %, 25-55%: 15 %

24. RELIEF AMPLI.: a. Amplitude: low b. Variability: High

25. TERRAIN: Undulating 2- 8%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:

d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: narrow b. Variability: Low

28. LAND FACETS: -1- Slopes, humitropepts, 55%

-2- Slopes, dystropepts, 40%

-3- Flat tops, hapludox, 5%

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Small blocks

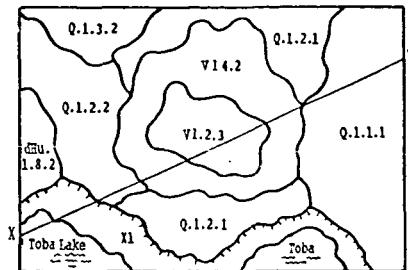
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 1 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 1 18.c: 1

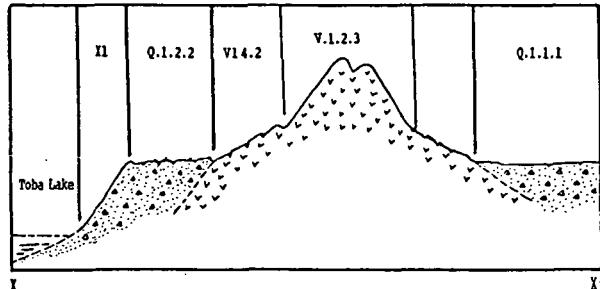
18.d-q: 2 19: 1 22: 2 23: 2 24: 2 28: 2 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Vd.1.2.3      2. MAP SHEET: 0618      3. AREA: 27 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/01/88      Status: Final
6. LAND UNIT DESCRIPTION: Strongly dissected upper slopes of the volcanoes, acid tuffs, slopes >30%
7. SATELLITE SCENES : 125/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 T2 /8323-131
9. RADAR : Star-I/250/88/0618-1
10. PARENT MATERIAL      11. ROCK OUTCROP: 10 %
- a. Weathering : Partial
  - b. Lithology : dacite
  - c. Formation : Qvi
12. WATER      a. Quality : Fresh  
b. Source : Rain, Perennial River
13. FISHERIES : None
14. RIVERS a. Floodrisk : None  
b. Inundation: None
15. VEGETATION/LAND USE : moist primary lowland forest, bush, alang-alang, reafforestation  
Area used : 0 %
16. ACCELERATED EROSION  
a. Occurrence : Extensive  
b. Evidence : Gullies
- 
17. SOIL GREAT GROUP :      Classification      % of area      Lab. checked
- |               |              |      |     |
|---------------|--------------|------|-----|
| Dominant >50% | hydrandepts  | 60 % | yes |
| Associated 1  | humitropepts | 30 % | yes |
| Associated 2  |              | %    |     |
- 
32. REPRESENTATIVE PROFILES:
- |      |   |                 |       |      |   |                 |       |
|------|---|-----------------|-------|------|---|-----------------|-------|
| inw/ | / | /87/pt/0618/63/ | /019/ | ith/ | / | /87/kr/0618/34/ | /024/ |
| /    | / | /87/jh/0618/    | /43/  | /    | / | /87/jh/0618/    | /44/  |

**18. SOIL CHARACTERISTICS**

Properties	Dominant > 50%	Associated 1	Associated 2
a. Texture: topsoil	fine	moderately fine	--
subsoil	fine	medium	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	mod. shallow	--
c. Drainage:	Well drained	Moderately well	--
d. Exch. K: topsoil	medium	high	--
subsoil	low	high	--
e. Total K2O: topsoil	low	medium	--
subsoil	low	high	--
f. Avail. P: method	Bray I	Bray I	
topsoil	very low	very low	--
subsoil	very low	very low	--
g. Total P:	topsoil	low	--
subsoil	very low	low	--
h. CEC pH 7	topsoil	high	medium
subsoil	high	medium	--
i. Soil Reaction: topsoil	excessive acid	strong acid	--
subsoil	very strong acid	strong acid	--
j. Al Sat. topsoil	high	very low	--
subsoil	medium	low	--
k. Al toxicity :	no	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	38 cm	--
p. Organic Matter :	9.1	7.1	0.0
q. TEB :	1.1	7.5	0.0
r. Total observations:	2	2	0

**19. ALTITUDE:** Maximum: 1500 m      Minimum: 900 m      Range: 1400 m

**20. PLAN/PROFILE:** Dominant: non-linear and random > 60% of area crested/peaked  
Included:

**21. L.U. DRAINAGE:** a. Pattern: radial      b. density: Mod. high  
c. Variability: high

**22. SLOPE:** a. Steepness: very steep      b. Variability: High  
c. Length: long      d. Variability: Medium  
e. Curvature: compound

**23. SLOPE DISTR.:** Valleybottoms: %  
Interfluves : 0-8%: 0 %, 9-25%: 0 %, 25-55%: 40 %, >55%: 60 %

**24. RELIEF AMPLI.:** a. Amplitude: very high      b. Variability: Medium

**25. TERRAIN:** Mountainous >16%, >300m

**26. CREST/RIDGES:** a. Shape: Undulating      b. Length: Moderately long      c. Variability: Medium  
d. Width: narrow      e. Variability: Medium

**27. VALLEY FLOOR:** a. Width: very narrow      b. Variability: Low

**28. LAND FACETS:** -1- Lower slopes, humitropepts, 40%  
-2- Upper & middle slopes, hydrandepts, 60%  
-3-  
-4-

**29. FRAGMENTATION:** Valleys: None      Interfluves:

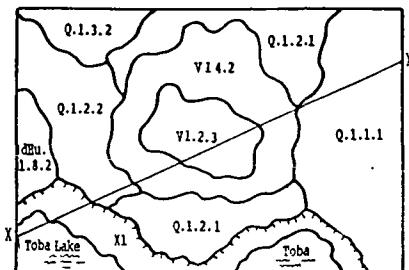
**30. RELIABILITY:** 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1    12.a: 2    14.a: 1    14.b: 1    17: 2    18.a: 2    18.b: 2    18.c: 1

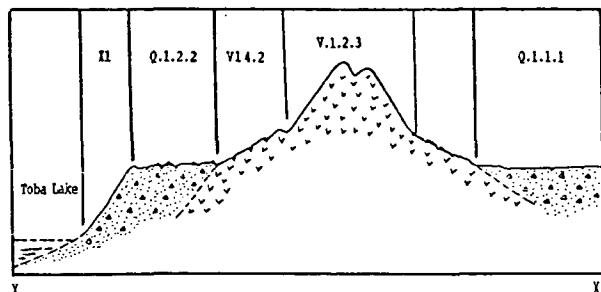
18.d-q: 2    19: 2    22: 2    23: 3    24: 2    28: 3    29: 2

**31. ADDITIONAL NOTES:**

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Vad.1.2.3      2. MAP SHEET: 0618      3. AREA: 26 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/01/88      Status: Temporary
6. LAND UNIT DESCRIPTION: Strongly dissected upper slopes of the volcanoes, acid to basic tuffs, slope >30%
7. SATELLITE SCENES : 129/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 145 /8319-117, 135 /8323-103
9. RADAR : Star-I/250/88/0618-4,6
10. PARENT MATERIAL      11. ROCK OUTCROP: 40 %
- a. Weathering : Partial
  - b. Lithology : andesitic tuffs, dacite
  - c. Formation : Qvpb , Qvss
12. WATER a. Quality : Fresh  
b. Source : Rain
13. FISHERIES : None
14. RIVERS a. Floodrisk : None  
b. Inundation: None
15. VEGETATION/LAND USE : moist primary submontane forest, bush, alang-alang, reafforestation  
Area used : 10 %
16. ACCELERATED EROSION
- a. Occurrence : Extensive
  - b. Evidence : Gullies

17. SOIL GREAT GROUP :	Classification	% of area	Lab. checked
Dominant >50%	hydrandepts	50 %	yes
Associated 1	dystrandeps	10 %	no
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

inw/	/	/87/kr/0618/61/	/001/	inw/	/	/87/mr/0618/63/	/001/
inw/	/	/87/lh/0618/63/	/010/	inw/	/	/87/lh/0618/	/11 /

**18. SOIL CHARACTERISTICS**

Properties	Dominant > 50%	Associated 1	Associated 2
a. Texture:	topsoil moderately fine subsoil moderately fine	-- --	-- --
b. Depth:	peatsoil -- mineralsoil mod. shallow	-- --	-- --
c. Drainage:	Moderately well	--	--
d. Exch. K:	topsoil medium subsoil medium	-- --	-- --
e. Total K2O:	topsoil high subsoil medium	-- --	-- --
f. Avail. P:	method Bray I topsoil very low subsoil very low	-- -- --	-- -- --
g. Total P:	topsoil medium subsoil medium	-- --	-- --
h. CEC pH 7	topsoil medium subsoil medium	-- --	-- --
i. Soil Reaction:	topsoil strong acid subsoil strong acid	-- --	-- --
j. Al Sat.	topsoil very low subsoil very low	-- --	-- --
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	42 cm	--	--
p. Organic Matter :	4.8	0.0	0.0
q. TEB :	12.2	0.0	0.0
r. Total observations:	5	0	0

19. ALTITUDE: Maximum: 1800 m Minimum: 1500 m Range: 1600 m

20. PLAN/PROFILE: Dominant: non-linear and random > 60% of area crested/peaked  
Included:

21. L.U. DRAINAGE: a. Pattern: radial b. density: Mod. high

c. Variability: medium

d. Variability: Medium

e. Variability: Medium

22. SLOPE: a. Steepness: very steep b. Variability: Medium

c. Length: moderate

d. Variability: Medium

e. Curvature: straight

23. SLOPE DISTR.: Valleybottoms: %

Interfluves : 0-8%: 0 %, 9-25%: 0 %, 25-55%: 60 %, &gt;55%: 40 %

24. RELIEF AMPLI.: a. Amplitude: very high b. Variability: Low

25. TERRAIN: Mountainous &gt;16%, &gt;300m

b. Variability: Low

26. CREST/RIDGES: a. Shape: Undulating b. Length: Moderately long c. Variability: Low

d. Width: narrow

e. Variability: Low

27. VALLEY FLOOR: a. Width: b. Variability:

28. LAND FACETS: -1- Middle and lower slope, hydrandepts, 50%

-2- upper slopes, dystrandeps, 10%

-3- Rock out crop, 40%

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

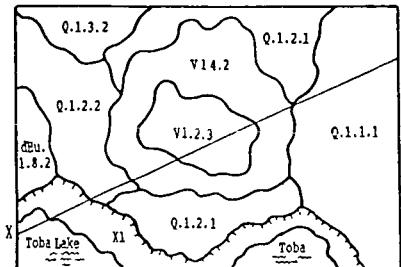
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 1

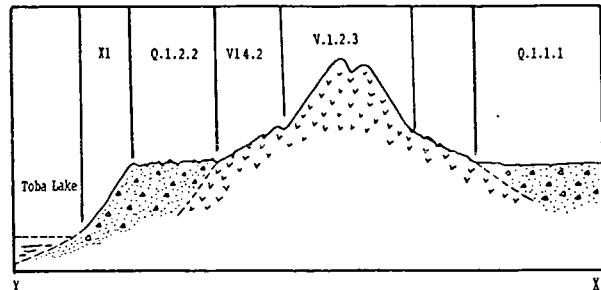
18.d-q: 3 19: 2 22: 2 23: 2 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Vb.1.2.3      2. MAP SHEET: 0618      3. AREA: 49 km<sup>2</sup>
4. OCCURENCE by PROVINCE: Sumatera Utara: 99%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/05/89      Status: Final
6. LAND UNIT DESCRIPTION: Strongly dissected upper slopes of the volcanoes, intermediate and mafic lavas, slopes >30%.
7. SATELLITE SCENES : 128/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 17A / -188,
9. RADAR : Star-I/250/88/0618-6
10. PARENT MATERIAL      11. ROCK OUTCROP: %
- a. Weathering : Partial
  - b. Lithology : andesitic lavas
  - c. Formation : QTvs
12. WATER a. Quality : Fresh  
b. Source : Rain, Perennial River
13. FISHERIES : None
14. RIVERS a. Floodrisk : None  
b. Immundation: None
15. VEGETATION/LAND USE : moist primary submontane forest, bush, reafforestation  
Area used : 0 %
16. ACCELERATED EROSION  
a. Occurrence : Extensive  
b. Evidence : Gullies
- 
17. SOIL GREAT GROUP :
- |                         | Classification | % of area | Lab. checked |
|-------------------------|----------------|-----------|--------------|
| <b>Dominant &gt;50%</b> | hydrandepts    | 65 %      | yes          |
| <b>Associated 1</b>     | troporthents   | 30 %      | no           |
| <b>Associated 2</b>     | humitropepts   | 5 %       | yes          |
- 
32. REPRESENTATIVE PROFILES:
- | inw/ | / | /87/mr/0618/64/ | /005/ | ith/ | / | /87/lh/0618/64/ | /019/ |
|------|---|-----------------|-------|------|---|-----------------|-------|
| /    | / | /87/pt/0618/    | /19/  |      |   |                 |       |

## **18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
<b>a. Texture:</b>	<b>topsoil</b> moderately coarse	--	moderately fine
	<b>subsoil</b> moderately coarse	--	moderately fine
<b>b. Depth:</b>	<b>peatsoil</b> --	--	--
	<b>mineralsoil</b> very deep	--	very deep
<b>c. Drainage:</b>	Well drained	--	Well drained
<b>d. Exch. K:</b>	<b>topsoil</b> low	--	very low
	<b>subsoil</b> very low	--	very low
<b>e. Total K2O:</b>	<b>topsoil</b> low	--	very high
	<b>subsoil</b> low	--	high
<b>f. Avail. P:</b>	<b>method</b> Bray I		Bray I
	<b>topsoil</b> very low	--	very low
	<b>subsoil</b> very low	--	very low
<b>g. Total P:</b>	<b>topsoil</b> low	--	very low
	<b>subsoil</b> very low	--	very low
<b>h. CEC pH 7</b>	<b>topsoil</b> low	--	low
	<b>subsoil</b> low	--	low
<b>i. Soil Reaction:</b>	<b>topsoil</b> strong acid	--	very strong acid
	<b>subsoil</b> strong acid	--	very strong acid
<b>j. Al Sat.</b>	<b>topsoil</b> medium	--	low
	<b>subsoil</b> very low	--	low
<b>k. Al toxicity :</b>	no	--	--
<b>l. Acid sulph. pot.:</b>	--	--	--
<b>m. Salinity :</b>	salt free	--	salt free
<b>n. Other Toxicity:</b>	--	--	--
<b>o. Root obstr. layer :</b>	120 cm	--	120 cm
<b>p. Organic Matter :</b>	7.7	0.0	6.3
<b>q. TEB :</b>	0.6	0.0	0.5
<b>r. Total observations:</b>	2	0	1

**19. ALTITUDE:** Maximum: 1300 m Minimum: 1000 m Range: 1300 m

**20. PLAN/PROFILE:** Dominant: non-linear and random > 60% of area flat-topped  
Included:

**21. L.U. DRAIAGE:** a. Pattern: radial b. density: Mod. high

### c. Variability: hi

**22. SLOPE:** a. Steepness: very steep b. Variability: High

c. Length: long

e. Curvature: compound

23. SLOPE DISTR.: Valley bottoms: %

Interfluvies : 0-87-0 % 9-257- 0 % 25-557- 60 % >557- 40 %

24 BELIEF AMPL.: a. Amplitude: very high

**25 TERRAIN** Hilly >36% 51-300

25. TERRAIN: hilly >182, 31-300m  
26. CREST/RIDGES: a. Shape: Undulating b. Length-Moderately long c. Variability: Medium

**28. CAST/RINGS:** a. Shape: undulating b. Length: moderately i.  
b. Width: narrow ii. Very little - Medium

**d. width:** narrow      **e. variability:** Medium

27. VALLEY FLOOR: a. Width: Very narrow b. Variability: Low

**28. LAND FACETS:** -1- Upper & middle slopes, hydromedians, 65%

-2- Upper & middle slopes, troporthents, 30%

-3- lower slopes, humitropepts, 5%

- 4 -

[View Details](#) | [Edit](#) | [Delete](#)

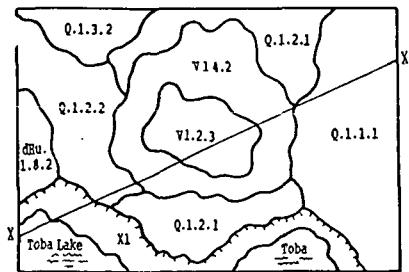
**30. RELIABILITY:** 1= reliable, 2= probable, 3= tenable, 4= plausible

**10.b** : 2   **12.a**: 1   **14.a**: 1   **14.b**: 1   **17**: 2   **18.a**: 2   **18.b**: 2

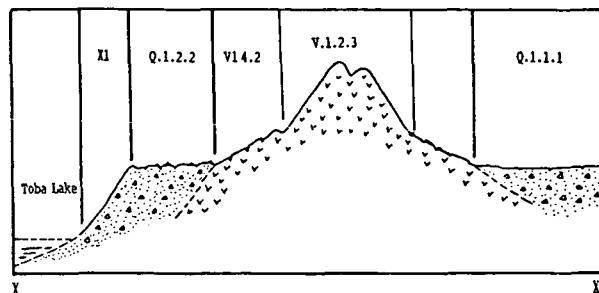
**18. d-q:** 2      **19:** 2      **22:** 2      **23:** 2      **24:** 2      **28:** 3      **29:** 2

**31. ADDITIONAL NOTES:**

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Vad.1.4.2

2. MAP SHEET: 0618

3. AREA: 29 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/01/88 Status: Temporary

6. LAND UNIT DESCRIPTION: Moderately dissected lower slope of volcanoes, acid to mafic tuffs, slope &lt;16%

7. SATELLITE SCENES : 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 135 /8323-103, 145 /8319-117

9. RADAR : Star-I/250/88/0618-4,6

## 10. PARENT MATERIAL

## 11. ROCK OUTCROP: %

a. Weathering : Partial

b. Lithology : andesitic tuffs, dacite,

c. Formation : Qvss , Qvpb

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , bush, alang-alang, upland crops, horticultural crops, reef forestation  
Area used : 25 %

## 16. ACCELERATED EROSION

a. Occurrence : Localised

b. Evidence : Gullies

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	humitropepts	55 %	no
Associated 1	troporthents	30 %	no
Associated 2	hydrandepts	15 %	yes

## 32. REPRESENTATIVE PROFILES:

inw/ / 87/mr/0618/63/ /002/ / / 87/1h/0618/ / / 80 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil subsoil	-- --	moderately coarse moderately coarse
b. Depth:	peatsoil mineralsoil	-- --	-- extremely deep
c. Drainage:		--	Well drained
d. Exch. K:	topsoil subsoil	-- --	low low
e. Total K2O:	topsoil subsoil	-- --	low low
f. Avail. P:	method topsoil subsoil		Bray I very low very low
g. Total P:	topsoil subsoil	-- --	high high
h. CEC pH 7	topsoil subsoil	-- --	very high very high
i. Soil Reaction:	topsoil subsoil	-- --	excessive acid very strong acid
j. Al Sat.	topsoil subsoil	-- --	low very low
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	very shallow
m. Salinity :	--	--	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	--	--	170 cm
p. Organic Matter :	0.0	0.0	24.9
q. TEB :	0.0	0.0	0.6
r. Total observations:	0	0	2

19. ALTITUDE: Maximum: 1500 m Minimum: 900 m Range: 1100 m

20. PLAN/PROFILE: Dominant: non-linear and random < 40% of area flat-topped  
Included: non-linear and random 40-60% of area flat-topped21. L.U. DRAINAGE: a. Pattern: parallel b. density: Moderate  
c. Variability: low22. SLOPE: a. Steepness:sloping b. Variability: Medium  
c. Length: long d. Variability: Medium  
e. Curvature: undulating23. SLOPE DISTR.: Valleybottoms: 5 %  
Interfluves : 0-8%:50 %, 9-25%: 45 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Medium

25. TERRAIN: Rolling 9-15%, 0-50 m

26. CREST/RIDGES: a. Shape: Undulating b. Length:Short c. Variability: Low  
d. Width: moderate e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Lower slopes, humitropepts, 55%  
-2- Upper slopes, troporthents, 30%  
-3- Middle slopes/fan head, hydrandepts, 15%  
-4-

29. FRAGMENTATION: Valleys: Interfluves: Medium blocks

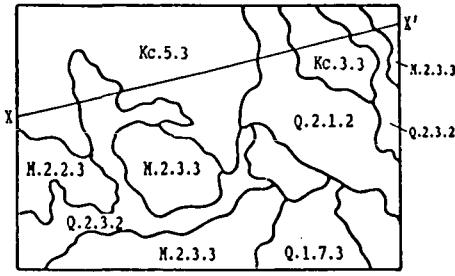
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 3 18.b: 3 18.c: 2

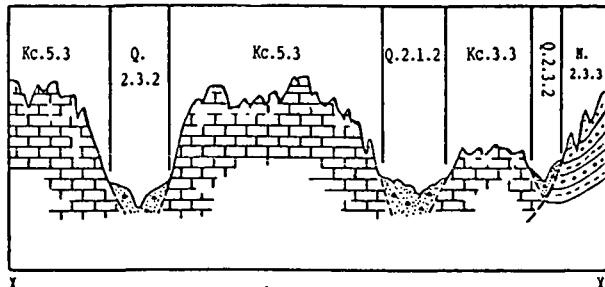
18.d-q: 3 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:

**1. LAND UNIT:** Kc.3.3**2. MAP SHEET:** 0618**3. AREA:** 43 km<sup>2</sup>**4. OCCURENCE by PROVINCE:** Sumatera Utara: 99%**5. STATUS IDENTIFIERS :** Updated by: DR edit date: 05/05/89 Status: Final**6. LAND UNIT DESCRIPTION:** Strongly dissected karstic hills, limestones, slopes 15-75%.**7. SATELLITE SCENES :** 128/58/08/08/85, 129/58/08/08/85**8. AERIAL PHOTOGRAPHS :** 1:100.000 T2 /8323-153, T2 /8323-133**9. RADAR :** STAR-I/250/88/0618-1,6**10. PARENT MATERIAL****11. ROCK OUTCROP:** 30 %

a. Weathering : High

b. Lithology : limestone/marble

c. Formation : Ppal.

**12. WATER** a. Quality : Fresh

b. Source : Rain, Perennial River

**13. FISHERIES** : None**14. RIVERS** a. Floodrisk : None

b. Immdation: None

**15. VEGETATION/LAND USE** : forest on limestone, bush, upland crops, rock outcrops**Area used** : 20 %**16. ACCELERATED EROSION**

a. Occurrence : Common

b. Evidence : Landslips

**17. SOIL GREAT GROUP** :

	Classification	% of area	Lab. checked
Dominant >50%	hapludalfs	50%	yes
Associated 1	dystropepts	10 %	yes
Associated 2	eutropepts	10%	no

**32. REPRESENTATIVE PROFILES:**

ada/	/	/87/kr/0618/34/	/022/	ada/	/	/87/jh/0618/53/	/025/
ity/	/	/87/pt/0618/53/	/018/				

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	fine fine	fine fine
b. Depth:	peatsoil -- mineralsoil moderately deep	-- shallow	-- very deep
c. Drainage:	Well drained	Moderately well	Well drained
d. Exch. K:	topsoil very low subsoil very low	low very low	-- --
e. Total K2O:	topsoil low subsoil low	low very low	low low
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	-- --
g. Total P:	topsoil low subsoil low	very low very low	low very low
h. CEC pH 7	topsoil medium subsoil medium	medium low	low very low
i. Soil Reaction:	topsoil moderately alkaline subsoil moderately alkaline	neutral neutral	very strong acid strong acid
j. Al Sat.	topsoil very low subsoil very low	very low very low	-- --
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	63 cm	47 cm	--
p. Organic Matter :	3.7	2.4	0.0
q. TEB :	25.8	8.0	0.0
r. Total observations:	2	1	1

19. ALTITUDE: Maximum: 1500 m Minimum: 700 m Range: 900 m

20. PLAN/PROFILE: Dominant: non-linear and random > 60% of area crested/peaked  
Included:21. L.U. DRAINAGE: a. Pattern: karstic b. density: Mod. high  
c. Variability: high22. SLOPE: a. Steepness:Steep b. Variability: High  
c. Length: long d. Variability: Medium  
e. Curvature: compound

23. SLOPE DISTR.: Valleybottoms: 5 % Interfluves : 0-8%: 0 %, 9-25%: 20 %, 25-55%: 70 %, &gt;55%: 5 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Medium

25. TERRAIN: Hilly &gt;16%, 51-300m

26. CREST/RIDGES: a. Shape: Irregular b. Length:Very long c. Variability: High  
d. Width: moderate e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Midle slopes, hapludalfs, 50%  
-2- Upper slopes, dystropepts, 10%  
-3- lower slopes, eutropepts, 10%  
-4- Rock outcrops, 30%

29. FRAGMENTATION: Valleys: None Interfluves:

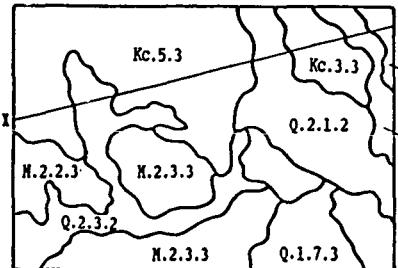
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 1 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

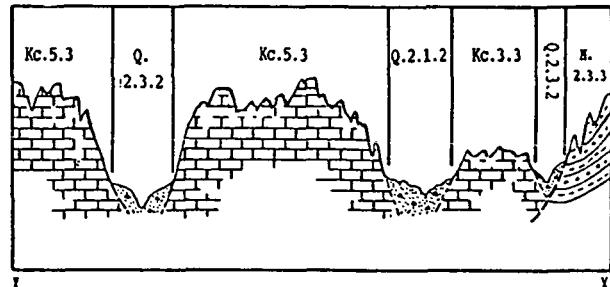
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 2 29: 3

31. ADDITIONAL NOTES: Eutropepts (ite) extrapolation based on RePPPProT, Land System KL 6-62

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Kc.5.3

2. MAP SHEET: 0618-

3. AREA: 130 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 06/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected karstic mountains, limestones, slopes 30-75%.

7. SATELLITE SCENES : 129/59/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 T2 /8323-133, 145 /8347-85

9. RADAR : STAR-I/250/88/0618-6

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 30 %

a. Weathering : High

b. Lithology : limestone/marble, ,

c. Formation : Ppal ,

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Imundation: None

15. VEGETATION/LAND USE : forest on limestone, bush

Area used : 0 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	hapludalfs	50 %	yes
Associated 1	dystropepts	10 %	yes
Associated 2	eutropepts	10 %	

## 32. REPRESENTATIVE PROFILES:

ada/ / 87/pt/0618/53/ /001/ ity/ / /87/ah/0618/43/ /023/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil moderately fine subsoil moderately fine	fine fine	moderately fine --
b. Depth:	peatsoil -- mineralsoil moderately deep	-- very deep	-- mod. shallow
c. Drainage:	Well drained	Well drained	Well drained
d. Exch. K:	topsoil low subsoil very low	very low very low	-- --
e. Total K2O:	topsoil medium subsoil low	very low very low	medium medium
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	Bray I medium very high
g. Total P:	topsoil medium subsoil very low	very high very high	medium very low
h. CEC pH 7	topsoil high subsoil low	low low	high medium
i. Soil Reaction:	topsoil neutral subsoil slightly alkaline	very strong acid very strong acid	neutral slightly alkaline
j. Al Sat.	topsoil very low subsoil very low	very high very high	-- --
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	76 cm	120 cm	--
p. Organic Matter :	2.3	2.6	0.0
q. TEB :	17.9	0.5	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 1575 m Minimum: 450 m Range: 900 m

20. PLAN/PROFILE: Dominant: non-linear and random > 60% of area crested/peaked  
Included:21. L.U. DRAINEAGE: a. Pattern: karstic b. density: High  
c. Variability: high22. SLOPE: a. Steepness:Steep b. Variability: High  
c. Length: short d. Variability: Medium  
e. Curvature: compound

23. SLOPE DISTR.: Valleybottoms: 10 %

Interfluves : 0-8%:0 %, 9-25%: 10 %, 25-55%: 50 %, &gt;55%: 30 %

24. RELIEF AMPLI.: a. Amplitude: high b. Variability: Medium

25. TERRAIN: Mountainous &gt;16%, &gt;300m

26. CREST/RIDGES: a. Shape: Irregular b. Length:Short c. Variability: Medium  
d. Width: narrow e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS:  
-1- Middle slopes, hapludalfs, 50%  
-2- Upper slopes, dystropepts, 10%  
-3- lower slopes, eutropepts, 10%  
-4- Rock outcrop, 30%

29. FRAGMENTATION: Valleys: None Interfluves:

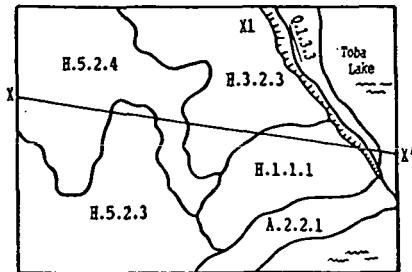
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 1 18.b: 2 18.c: 1

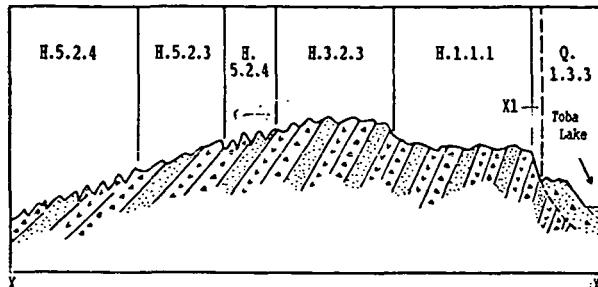
18.d-q: 2 19: 2 22: 3 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES: Eutropepts (ite) extrapolated from RePPProT, Land System 650/078

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hu.1.1.1      2. MAP SHEET: 0618      3. AREA: 15 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/05/89      Status: Temporary
6. LAND UNIT DESCRIPTION: Slightly dissected hills, mixed sedimentary rocks, gently slopes (0-15%)
7. SATELLITE SCENES : 128/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 135 /8323-119
9. RADAR : STAR-I/250/88/0618-3
10. PARENT MATERIAL      11. ROCK OUTCROP: 0 %
- a. Weathering : High
  - b. Lithology : diatomite, conglomerate, sandstone
  - c. Formation : Qps
12. WATER a. Quality : Fresh  
b. Source : Rain
13. FISHERIES : Danau (lake)
14. RIVERS a. Floodrisk : None  
b. Inundation: None
15. VEGETATION/LAND USE : , upland crops, rainfed wetland rice, reafforestation, towns, villages  
Area used : 90 %
16. ACCELERATED EROSION  
a. Occurrence : Common  
b. Evidence : Gullies
- 
17. SOIL GREAT GROUP :  

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	70 %	no
Associated 1	eutropepts	30 %	yes
Associated 2			
- 
32. REPRESENTATIVE PROFILES:  
 Site/ / 87/lh/0618/62/ /035/      City/ / / 87/kr/0618/34/ /50 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	fine	fine	--
subsoil	fine	fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	deep	very deep	--
c. Drainage:	Moderately well	Moderately well	--
d. Exch. K:	topsoil --	low	--
subsoil	--	medium	--
e. Total K2O:	topsoil --	very high	--
subsoil	--	very high	--
f. Avail. P:	method	Bray I	
topsoil	--	very low	--
subsoil	--	very low	--
g. Total P:	topsoil --	high	--
subsoil	--	low	--
h. CEC pH 7	topsoil --	low	--
subsoil	--	low	--
i. Soil Reaction:	topsoil moderately acid	excessive acid	--
subsoil moderately acid		very strong acid	--
j. Al Sat.	topsoil --	low	--
subsoil	--	low	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	94 cm	120 cm	--
p. Organic Matter :	0.0	1.1	0.0
q. TEB :	0.0	7.0	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 1100 m Minimum: 925 m Range: 1000 m

20. PLAN/PROFILE: Dominant: linear and parallel 40-60% of area flat-topped  
Included: linear and parallel < 40% of area flat-topped21. L.U. DRAINAGE: a. Pattern: parallel b. density: Low  
c. Variability: low22. SLOPE: a. Steepness:sloping b. Variability: Low  
c. Length: moderate d. Variability: Low  
e. Curvature: straight23. SLOPE DISTR.: Valleybottoms: 5 %  
Interfluves : 0-8%:45 %, 9-25%: 50 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Low

25. TERRAIN: hillocky &gt;16%, 0-50 m

26. CREST/RIDGES: a. Shape: b. Length: c. Variability:  
d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Upper and mid. slopes, dystropepts, 70%

-2- Lower slopes &amp; valley, eutropepts, 30%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

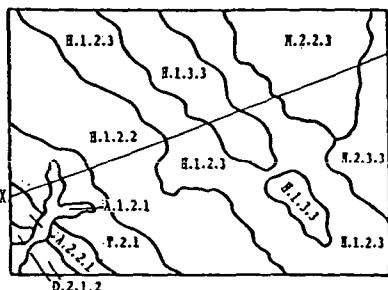
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

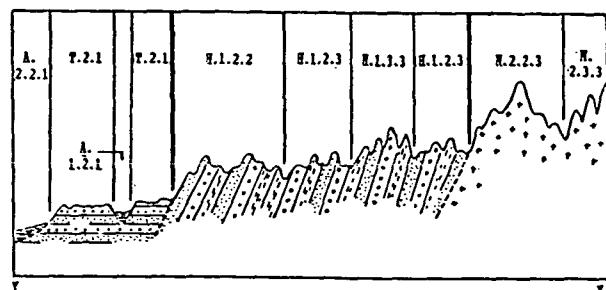
18.d-q: 3 19: 2 22: 2 23: 2 24: 2 28: 2 29: 3

31. ADDITIONAL NOTES:

MAP IMAGE:



CROSS SECTION:



1. LAND UNIT: Hfq.1.2.2      2. MAP SHEET: 0618      3. AREA: 191 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: DI Aceh: 18%, Sumatera Utara: 82%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/05/89      Status: Final
6. LAND UNIT DESCRIPTION: Moderately dissected hills, felsic fine and coarse sedimentary rocks, moderately steep slope (15-30%)
7. SATELLITE SCENES : 129/58/08/08/85, 129/59/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 10C / -054, 10A / -046, 11I / -111
9. RADAR : Star-I/250/88/0618-146
10. PARENT MATERIAL      11. ROCK OUTCROP: %
- a. Weathering : High
  - b. Lithology : sandstone, claystone,
  - c. Formation : Tmba , Tlsb
12. WATER a. Quality : Fresh  
b. Source : Rain, Perennial River
13. FISHERIES : None
14. RIVERS a. Floodrisk : None  
b. Imundation: None
15. VEGETATION/LAND USE : moist primary lowland forest, bush, upland crops, rubber (karet), towns, villages  
Area used : 25 %
16. ACCELERATED EROSION
- a. Occurrence : Common
  - b. Evidence : Various
- 
17. SOIL GREAT GROUP :      Classification      % of area      Lab. checked
- |               |             |      |     |
|---------------|-------------|------|-----|
| Dominant >50% | dystropepts | 90 % | yes |
| Associated 1  | kanapluults | 10 % | no  |
| Associated 2  |             |      |     |
- 
32. REPRESENTATIVE PROFILES:
- |                              |                          |
|------------------------------|--------------------------|
| ity/ / /87/kr/0618/51/ /031/ | ity/ / /kr/0618/ / /31 / |
| udh/ / /88/es/0618/22/ /24 / | udh/ / /es/0618/ / /24 / |
| / / /gd/0618/ / /24 /        | / / /jh/0618/ / /60 /    |

## 18. SOIL CHARACTERISTICS

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil moderately fine subsoil moderately fine	-- --	-- --
b. Depth:	peatsoil -- mineralsoil very deep	-- --	-- --
c. Drainage:		Well drained	--
d. Exch. K:	topsoil very low subsoil very low	-- --	-- --
e. Total K2O:	topsoil low subsoil high	-- --	-- --
f. Avail. P:	method Bray I topsoil very low subsoil very low	-- -- --	-- -- --
g. Total P:	topsoil very low subsoil very low	-- --	-- --
h. CEC pH 7	topsoil low subsoil low	-- --	-- --
i. Soil Reaction:	topsoil moderately acid subsoil strong acid	-- --	-- --
j. Al Sat.	topsoil low subsoil high	-- --	-- --
k. Al toxicity :	no	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	129 cm	--	--
p. Organic Matter :	3.0	0.0	0.0
q. TEB :	0.5	0.0	0.0
r. Total observations:	3	0	0

**19. ALTITUDE:** Maximum: 900 m Minimum: 200 m Range: 500 m

**20. PLAN/PROFILE:** Dominant: linear and random 40-60% of area crested/peaked  
Included:

**21. L.U. DRAINAGE:** a. Pattern: dendritic b. density: Moderate  
c. Variability: medium

**23. SLOPE DISTR.: Valleybottoms: 5 %  
Interfluves: 0-8% - 10 % 9-25% - 65 % 25-55% - 20 %**

**24. RELIEF AMPL.: a. Amplitude:** medium      **b. Variability:** Medium

## 25. TERRAIN:

**26. CREST/RIDGES:**    a. Shape: Undulating    b. Length: Short    c. Variability: Medium  
                            d. Width: moderate    e. Variability: Medium

**27. VALLEY FLOOR:** a. Width: very narrow      b. Variability: Low

28. LAND FACETS: -1- Crest, upper & middle, dystropepts, 90%

-3-

29 FRAGMENTATION: Valleys: None Interfluves: None

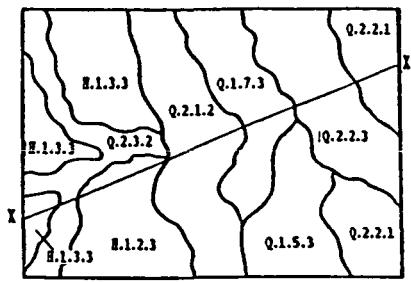
**30. RELIABILITY:** 1= reliable, 2= probable, 3= tenable, 4= plausible

**19.b**: 2    **12.a**: 2    **14.a**: 2    **14.b**: 1    **17**: 2    **18.a**: 2    **18.b**: 2    **18.c**: 3

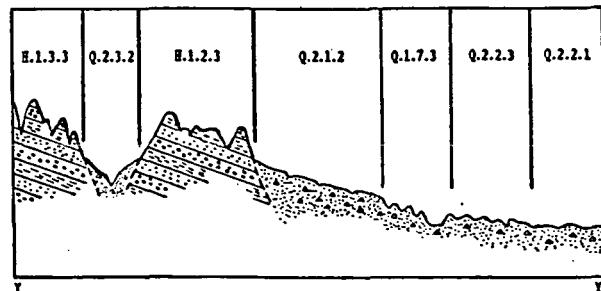
**18.d-g:** 3    **19:** 2    **22:** 2    **23:** 2    **24:** 2    **28:** 3    **29:** 2

**31. ADDITIONAL NOTES:** Kanhapludults extrapolation from Hfq.1.2.3 map sheet 0718

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hfq.1.2.3

2. MAP SHEET: 0618

3. AREA: 96 km<sup>2</sup>

4. OCCURENCE by PROVINCE: DI Aceh: 40%, Sumatera Utara: 60%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 23/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected hills, felsic fine and coarse sedimentary rocks, moderately steep slope (15-30%)

7. SATELLITE SCENES : 129/58/08/08/85, 129/59/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 11F / -047, 11G / -036, 10C / -058

9. RADAR : Star-I/250/88/0618-134

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

a. Weathering : High

b. Lithology : sandstone, claystone,

c. Formation : Tlsb ,

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Imundation: None

15. VEGETATION/LAND USE : moist primary lowland forest, bush, upland crops, rubber (karet), towns, villages

Area used : 20 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Various mostly gullies

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	90 %	yes
Associated 1	kanhapludults	10 %	no
Associated 2			

## 32. REPRESENTATIVE PROFILES:

ity/ /	/87/kr/0618/51/ /031/	ity/ /	/ /kr/0618/ / /31 /
udh/ /	/88/es/0618/22/ /24 /	udh/ /	/ /es/0718/ / /24 /
/ /	/ /gd/0618/ / /24 /	/ /	/ /jh/0618/ / /60 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil moderately fine subsoil moderately fine	fine fine	-- --
b. Depth:	peatsoil -- mineralsoil very deep	-- very deep	-- --
c. Drainage:		Well drained	Well drained
d. Exch. K:	topsoil very low subsoil very low	low very low	-- --
e. Total K2O:	topsoil low subsoil high	very high very high	-- --
f. Avail. P:	method Bray I topsoil very low subsoil very low	very low very low	-- --
g. Total P:	topsoil very low subsoil very low	very low very low	-- --
h. CEC pH 7	topsoil low subsoil low	low low	-- --
i. Soil Reaction:	topsoil moderately acid subsoil strong acid	extreme acid strong acid	-- --
j. Al Sat.	topsoil low subsoil high	medium medium	-- --
k. Al toxicity :	no	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	129 cm	--	--
p. Organic Matter :	3.0	1.9	0.0
q. TEB :	0.5	1.3	0.0
r. Total observations:	1	0	0

**19. ALTITUDE:** Maximum: 500 m Minimum: 200 m Range: 300 m

**20. PLAN/PROFILE:** Dominant: linear and random > 60% of area crested/peaked  
Included:

- 21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high
- c. Variability: medium
- 22. SLOPE: a. Steepness:mod. steep b. Variability: Medium
- c. Length: short d. Variability: Medium
- e. Curvature: undulating
- 23. SLOPE DISTR.: Valleybottoms: 10 % Interfluves : 0-8%:15 %, 9-25%: 70 %, 25-55%: 5 %
- 24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Low
- 25. TERRAIN:
- 26. CREST/RIDGES: a. Shape: Irregular b. Length:Short c. Variability: Low
- d. Width: narrow e. Variability: Medium
- 27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low
- 28. LAND FACETS: -1- Crest upper & lower sl, dystropepts, 90%  
-2- middle slope, kanhapludults, 10%  
-3-  
-4-
- 29. FRAGMENTATION: Valleys: None Interfluves:

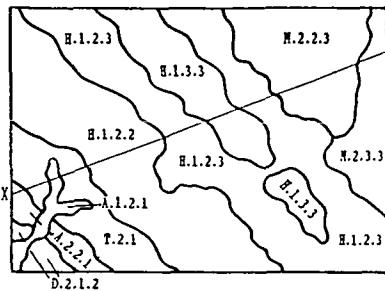
**30. RELIABILITY:** 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2  
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 3 29: 2

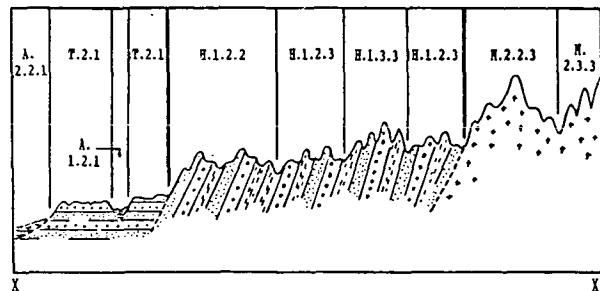
**31. ADDITIONAL NOTES:** Representative profile of kanhapludults  
(Pematang Siantar)

from sheet 0718

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hfq.1.3.3

2. MAP SHEET: 0618

3. AREA: 202 km<sup>2</sup>

4. OCCURENCE by PROVINCE: DI Aceh: 40%, Sumatera Utara: 60%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 23/03/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected hills, felsic fine and coarse sedimentary rocks, steep to very steep, slope (30-75%)

7. SATELLITE SCENES : 129/58/08/08/85, 129/59/08/08/85

8. AERIAL PHOTOGRAPHS: 1:100.000 12D / -072, 11F / -053, 10C / -058

9. RADAR : Star-I/250/88/0618-146

## 10. PARENT MATERIAL

## 11. ROCK OUTCROP: %

a. Weathering : High

b. Lithology : sandstone, claystone

c. Formation : Tlsb

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Immediation: None

15. VEGETATION/LAND USE : moist primary lowland forest, bush, rubber (karet)

Area used : 20 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Gullies

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	90 %	no
Associated 1	kanhapludults	10 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

ity/ / 87/gd/0618/31/ /021/ uda/ /300.1 /84/hd/0618/51/ /001/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately fine	moderately fine	--
subsoil	moderately fine	moderately fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil very low	low	--
subsoil	very low	low	--
e. Total K2O:	topsoil very low	high	--
subsoil	very low	high	--
f. Avail. P:	method		
topsoil	--	--	--
subsoil	--	--	--
g. Total P:	topsoil very low	very low	--
subsoil	very low	very low	--
h. CEC pH 7	topsoil low	very low	--
subsoil	low	low	--
i. Soil Reaction:	topsoil very strong acid	very strong acid	--
subsoil	strong acid	strong acid	--
j. Al Sat.	topsoil very high	high	--
subsoil	very high	high	--
k. Al toxicity :	yes	yes	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	120 cm	--
p. Organic Matter :	2.2	1.9	0.0
q. TEB :	0.5	0.5	0.0
r. Total observations:	1	3	0

19. ALTITUDE: Maximum: 550 m Minimum: 100 m Range: 450 m

20. PLAN/PROFILE: Dominant: linear and random &gt; 60% of area crested/peaked

Included:

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high

c. Variability: medium

22. SLOPE: a. Steepness:Steep b. Variability: Medium

c. Length: short

d. Variability: Medium

e. Curvature: convex

23. SLOPE DISTR.: Valleybottoms: 5 %

Interfluves : 0-8%:10 %, 9-25%: 25 %, 25-55%: 60 %

24. RELIEF AMPLI.: a. Amplitude: high b. Variability: Low

25. TERRAIN: Hilly &gt;16%, 51-300m

26. CREST/RIDGES: a. Shape: Irregular b. Length:Short c. Variability: Medium

d. Width: moderate e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Crest,upper &amp; lower sl, dystropepts, 90%

-2- Middle slopes, kanhapludults, 10%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

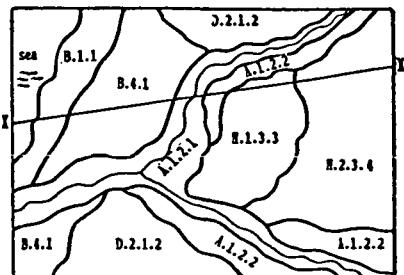
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 3 18.c: 2

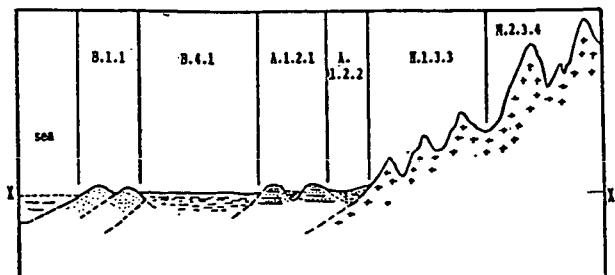
18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hg.1.3.3

2. MAP SHEET: 0618-

3. AREA: 59 km<sup>2</sup>

4. OCCURENCE by PROVINCE: DI Aceh: 14%, Sumatera Utara: 86%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 30/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected hills, acid plutonic rock, steep to very steep, slope (30-75%)

7. SATELLITE SCENES : 129/58/08/08/85, 129/59/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 10C / -042, 12B / -008

9. RADAR : STAR-I/250/88/0618-1,6

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 5 %

a. Weathering : High

b. Lithology : granite, granodiorite

c. Formation : MPisl

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Imundation: None

15. VEGETATION/LAND USE : moist primary lowland forest, bush, rubber (karet)

Area used : 30 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	90 %	yes
Associated 1	hapludults	10 %	no
Associated 2			

## 32. REPRESENTATIVE PROFILES:

ity/ / 87/D /0618/43/ /20 / uda/ / 87/MD/0618/22/ /35 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil medium subsoil medium	fine fine	moderately fine moderately fine
b. Depth:	peatsoil -- mineralsoil deep	-- very deep	-- very deep
c. Drainage:	Well drained	Well drained	Well drained
d. Exch. K:	topsoil low subsoil low	-- --	-- --
e. Total K2O:	topsoil high subsoil high	-- --	low very low
f. Avail. P:	method Bray I topsoil low subsoil low	-- -- --	-- -- --
g. Total P:	topsoil medium subsoil low	-- --	low low
h. CEC pH 7	topsoil low subsoil low	-- --	medium medium
i. Soil Reaction:	topsoil strong acid subsoil strong acid	very strong acid very strong acid	very strong acid very strong acid
j. Al Sat.	topsoil very low subsoil very low	-- --	-- --
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	80 cm	120 cm	--
p. Organic Matter :	1.0	0.0	0.0
q. TEB :	6.7	0.0	0.0
r. Total observations:	2	1	0

19. ALTITUDE: Maximum: 600 m Minimum: 150 m Range: 200 m

20. PLAN/PROFILE: Dominant: linear and random > 60% of area crested/peaked  
Included:21. L.U. DRAINEAGE: a. Pattern: dendritic b. density: Mod. high  
c. Variability: low22. SLOPE: a. Steepness:Steep b. Variability: Low  
c. Length: short d. Variability: Low  
e. Curvature: convex23. SLOPE DISTR.: Valleybottoms: 5 %  
Interfluves : 0-8%:10 %, 9-25%: 25 %, 25-55%: 60 %

24. RELIEF AMPLI.: a. Amplitude: high b. Variability: Low

25. TERRAIN: Hilly &gt;16%, 51-300m

26. CREST/RIDGES: a. Shape: Undulating b. Length:Short c. Variability: Medium  
d. Width: narrow e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Upper &amp; lower slopes, dystropepts, 90%

-2- Middle slopes, hapludults, 10%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

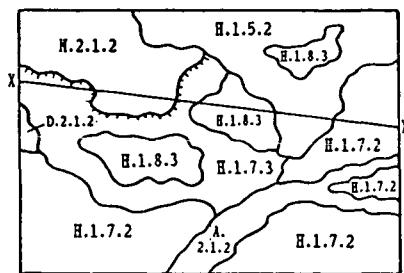
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

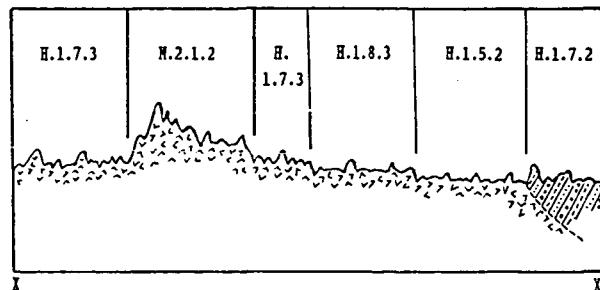
18.d-q: 3 19: 2 22: 2 23: 2 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES: Extrapolation based on RePPRoT Land System BBR - 61

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hb.1.5.2      2. MAP SHEET: 0618      3. AREA: 74 km<sup>2</sup>  
 4. OCCURENCE by PROVINCE: DI Aceh: 99%  
 5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/05/89      Status: Final  
 6. LAND UNIT DESCRIPTION: Moderately dissected rolling land with hillocks, intermediate and mafic lavas, slopes 8-25%  
 7. SATELLITE SCENES : 129/58/08/08/85  
 8. AERIAL PHOTOGRAPHS : 1:100.000 11F / -043, 12D / -072,  
 9. RADAR : star-I/250/88/0618-6  
 10. PARENT MATERIAL :      11. ROCK OUTCROP: %  
   a. Weathering : High  
   b. Lithology : andesitic lavas  
   c. Formation : Tmvt  
 12. WATER a. Quality : Fresh  
   b. Source : Rain, Perennial River  
 13. FISHERIES : None  
 14. RIVERS a. Floodrisk : None  
   b. Imundation: None  
 15. VEGETATION/LAND USE : moist primary lowland forest, bush, shifting cultivation  
   Area used : 10 %  
 16. ACCELERATED EROSION  
   a. Occurrence : Localised  
   b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	hapludults	90 %	yes
Associated 1	dystropepts	10 %	no
Associated 2			

## 32. REPRESENTATIVE PROFILES:

uda/	/	/87/ah/0618/44/	/017/	/	/	/0/	/0618/	/	/	/
/	/	/ /	/0618/	/ /	/					

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately fine	--	--
subsoil	moderately fine	--	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	--	--
c. Drainage:	Well drained	--	--
d. Exch. K: topsoil	very low	--	--
subsoil	very low	--	--
e. Total K2O: topsoil	very low	--	--
subsoil	very low	--	--
f. Avail. P: method	Bray I	--	--
topsoil	very low	--	--
subsoil	very low	--	--
g. Total P: topsoil	high	--	--
subsoil	low	--	--
h. CEC pH 7 topsoil	low	--	--
subsoil	low	--	--
i. Soil Reaction: topsoil	excessive acid	--	--
subsoil	excessive acid	--	--
j. Al Sat. topsoil	very high	--	--
subsoil	very high	--	--
k. Al toxicity :	no	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	--	--
p. Organic Matter :	1.6	0.0	0.0
q. TEB :	0.6	0.0	0.0
r. Total observations:	1	0	0

19. ALTITUDE: Maximum: 250 m Minimum: 100 m Range: 200 m

20. PLAN/PROFILE: Dominant: non-linear and random 40-60% of area crested/peaked  
Included:

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Moderate

c. Variability: medium

22. SLOPE: a. Steepness:sloping b. Variability: Medium  
c. Length: moderate d. Variability: Medium

e. Curvature: convex

23. SLOPE DISTR.: Valleybottoms: 10 % Interfluves : 0-8%:65 %, 9-25%: 25 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Low

25. TERRAIN: Rolling 9-15%, 0-50 m

26. CREST/RIDGES: a. Shape: Level b. Length:Short c. Variability: Low  
d. Width: narrow e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Rolling land, hapludults, 90%

-2- Hilly land, dystropepts, 10%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

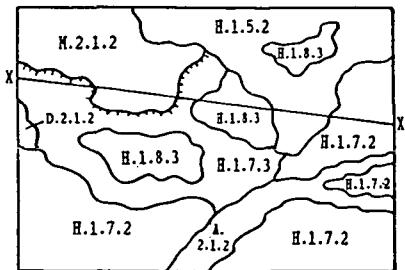
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 1

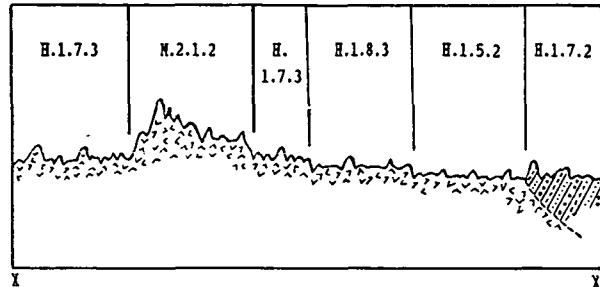
18.d-q: 3 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hfq.1.7.2      2. MAP SHEET: 0618      3. AREA: 139 km<sup>2</sup>
4. OCCURENCE by PROVINCE: DI Aceh: 99%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 30/05/89      Status: Final
6. LAND UNIT DESCRIPTION: Moderately dissected inter hill undulating to rolling land, felsic fine and coarse sedimentary rocks, slopes 5-15%
7. SATELLITE SCENES : 129/58/08/08/85,
8. AERIAL PHOTOGRAPHS : 1:100.000 12D / -070,
9. RADAR : STAR-I/250/88/0618-6
10. PARENT MATERIAL
- a. Weathering : High
  - b. Lithology : sandstone, claystone, conglomerate
  - c. Formation : T1sb
11. ROCK OUTCROP: 0 %

12. WATER a. Quality : Fresh  
b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None  
b. Immediation: None

15. VEGETATION/LAND USE : moist primary lowland forest, bush, shifting cultivation, upland crops  
Area used : 30 %

16. ACCELERATED EROSION

- a. Occurrence : Common
- b. Evidence : Landslips

17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	70 %	yes
Associated 1	kandiudults	30 %	yes
Associated 2			

32. REPRESENTATIVE PROFILES:

ity/ / 88/AH/0618/ / 15 / udk/ / /87/DR/0618/44/ /10 /

18. SOIL CHARACTERISTICS

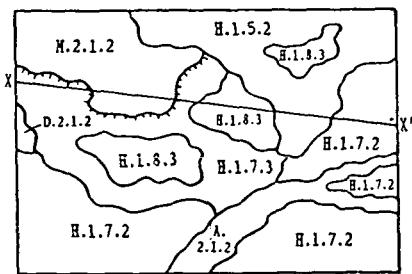
<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately fine	moderately coarse	--
subsoil	moderately fine	moderately fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil subsoil	very low very low	very low very low
e. Total K2O:	topsoil subsoil	very low very low	very low very low
f. Avail. P:	method topsoil subsoil	Bray I very low very low	Bray I very low very low
g. Total P:	topsoil subsoil	very low very low	very low very low
h. CEC pH 7	topsoil subsoil	very low very low	very low very low
i. Soil Reaction:	topsoil subsoil	strong acid strong acid	very strong acid strong acid
j. Al Sat.	topsoil subsoil	medium low	medium medium
k. Al toxicity :	no	no	--
l. Acid sulph. pot.:	not relevant	--	--
m. Salinity :	--	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	--	140 cm	--
p. Organic Matter :	2.5	1.0	0.0
q. TEB :	0.6	0.6	0.0
r. Total observations:	1	1	0

19. ALTITUDE:	Maximum: 500 m	Minimum: 250 m	Range: 300 m
20. PLAN/PROFILE:	Dominant: non-linear and random < 40% of area flat-topped Included: non-linear and random 40-60% of area crested/peaked		
21. L.U. DRAINAGE:	a. Pattern: dendritic c. Variability: medium	b. density: Moderate	
22. SLOPE:	a. Steepness:gently sloping c. Length: moderate e. Curvature: convex	b. Variability: Medium d. Variability: Medium	
23. SLOPE DISTR.:	Valleybottoms: 10 % Interfluves : 0-8%:70 %, 9-25%: 20 %, 25-55%: 0 %		
24. RELIEF AMPLI.:	a. Amplitude: low	b. Variability: Medium	
25. TERRAIN:	Undulating 2- 8%, 0-50 m		
26. CREST/RIDGES:	a. Shape: Level d. Width: moderate	b. Length: Moderately long e. Variability: Medium	c. Variability: Low
27. VALLEY FLOOR:	a. Width: very narrow	b. Variability: Low	
28. LAND FACETS:	-1- Upper & lower slopes, dystropepts, 70% -2- Middle slopes, kandiudults, 30% -3- -4-		
29. FRAGMENTATION:	Valleys: None	Interfluves: Medium blocks	

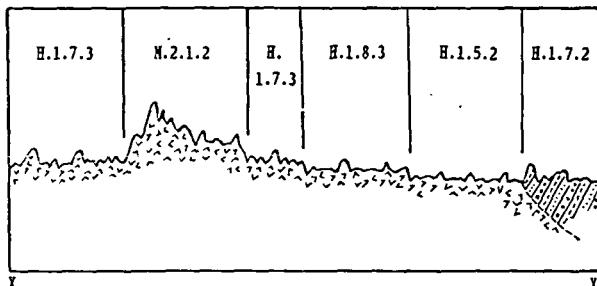
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible  
 10.b : 2   12.a: 2   14.a: 1   14.b: 1   17: 2   18.a: 2   18.b: 2   18.c: 2  
 18.d-q: 3   19: 2   22: 2   23: 3   24: 2   28: 3   29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hb.1.7.3      2. MAP SHEET: 0618-      3. AREA: 127 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: DI Aceh: 92%, Sumatera Utara: 8%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/05/89      Status: Final
6. LAND UNIT DESCRIPTION: Strongly dissected inter hills undulating to rolling land, intermediate and mafic lavas, slope 5-15%
7. SATELLITE SCENES : 129/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 11F / -047, 11F / -049,
9. RADAR : Star-I/250/88/0618-6
10. PARENT MATERIAL :      11. ROCK OUTCROP: %
- a. Weathering : High
  - b. Lithology : andesitic lavas
  - c. Formation : Tmvt
12. WATER a. Quality : Fresh  
b. Source : Rain, Perennial River
13. FISHERIES : None
14. RIVERS a. Floodrisk : None  
b. Imundation: None
15. VEGETATION/LAND USE : moist primary lowland forest, bush, shifting cultivation, unspecified estate (lain-lain), forest plantation  
Area used : 25 %
16. ACCELERATED EROSION  
a. Occurrence : Extensive  
b. Evidence : Gulleys
- 
17. SOIL GREAT GROUP :      Classification      % of area      Lab. checked
- |               |             |      |     |
|---------------|-------------|------|-----|
| Dominant >50% | dystropepts | 70 % | yes |
| Associated 1  | hapludults  | 30 % | yes |
| Associated 2  |             |      |     |
- 
32. REPRESENTATIVE PROFILES:  
ity/ / /87/dk/0618/44/ /012/      uda/ / /87/ah/0618/44/ /011/  
uda/ / /87/dr/0618/44/ /008/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately fine	moderately fine	--
subsoil	moderately fine	moderately fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil subsoil	low very low	low very low
e. Total K2O:	topsoil subsoil	very low very low	low very low
f. Avail. P:	method topsoil subsoil	Bray I very low very low	Bray I very low very low
g. Total P:	topsoil subsoil	high high	very low very low
h. CEC pH 7	topsoil subsoil	low low	low low
i. Soil Reaction: topsoil	excessive acid	excessive acid	--
subsoil	excessive acid	excessive acid	--
j. Al Sat.	topsoil subsoil	very high very high	very high very high
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	110 cm	135 cm	--
p. Organic Matter :	1.7	1.7	0.0
q. TEB :	0.5	0.4	0.0
r. Total observations:	1	2	0

19. ALTITUDE: Maximum: 300 m Minimum: 150 m Range: 250 m

20. PLAN/PROFILE: Dominant: non-linear and random < 40% of area flat-topped  
Included:

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high

c. Variability: medium

22. SLOPE: a. Steepness: gently sloping b. Variability: Medium  
c. Length: moderate d. Variability: Medium

e. Curvature: convex

23. SLOPE DISTR.: Valleybottoms: 15 %

Interfluves : 0-8%:60 %, 9-25%: 25 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: low b. Variability: Medium

25. TERRAIN: Undulating 2- 8%, 0-50 m

26. CREST/RIDGES: a. Shape: Level b. Length: Moderately long c. Variability: Low  
d. Width: moderate e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Middle slopes, hapludults, 30%

-2- Upper &amp; lower slopes, dystropepts, 70%

-3-

-4-

29. FRAGMENTATION: Valleys: Interfluves:

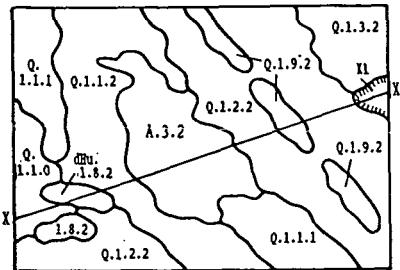
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

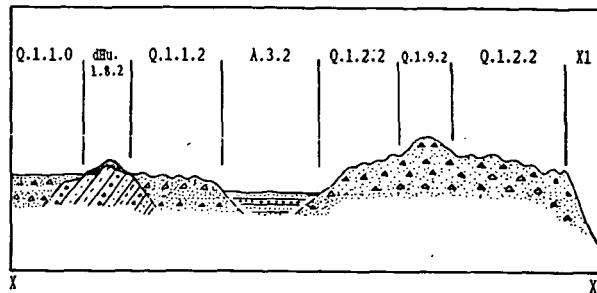
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 3 29:

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: dHu. 1.8.2

2. MAP SHEET: 0618

3. AREA: 192 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: DI Aceh: 6%, Sumatera Utara: 94%

5. STATUS IDENTIFIERS : Updated by: HD edit date: 02/01/89 Status: Final

6. LAND UNIT DESCRIPTION: Moderately dissected isolated hillocks mixed sedimentary rocks covered by acid tuffs, slopes 16-25%.

7. SATELLITE SCENES : 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 12B / -004, 12D / -062, 12B / -006

9. RADAR : Star-I/250/88/0618-3,4

## 10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : Partial

b. Lithology :

c. Formation : Qvt , Pnk

12. WATER a. Quality : Fresh

b. Source : Rain

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Immudation: None

15. VEGETATION/LAND USE : secondary forest, bush

Area used : 0 %

## 16. ACCELERATED EROSION

a. Occurrence : Common

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	90 %	yes
Associated 1	dystrandepts	10 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

ity/ / 87/TB/0618/ / 27 / iny/ / 87/KR/0618/33/ 60 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately coarse	moderately fine	--
subsoil	moderately coarse	fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	deep	mod. shallow	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil medium	low	--
subsoil	medium	very low	--
e. Total K2O:	topsoil very high	very high	--
subsoil	very high	very low	-
f. Avail. P:	method Bray I	Bray I	
topsoil	very low	low	--
subsoil	very low	very low	--
g. Total P:	topsoil very low	medium	--
subsoil	very low	very low	--
h. CEC pH 7	topsoil low	very high	--
subsoil	low	high	--
i. Soil Reaction: topsoil	very strong acid	very strong acid	--
subsoil	excessive acid	very strong acid	--
j. Al Sat.	topsoil high	very low	--
subsoil	high	medium	--
k. Al toxicity :	no	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	100 cm	44 cm	--
p. Organic Matter :	1.1	22.0	0.0
q. TEB :	0.6	4.0	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 1300 m Minimum: 100 m Range: 0 m

20. PLAN/PROFILE: Dominant: non-linear and random > 60% of area crested/peaked  
Included:

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Moderate

c. Variability: medium

22. SLOPE: a. Steepness:mod. steep b. Variability: Low

c. Length: moderate

d. Variability: Medium

e. Curvature: convex

23. SLOPE DISTR.: Valleybottoms: %

Interfluves : 0-8%: 5 %, 9-25%: 75 %, 25-55%: 20 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Medium

25. TERRAIN: hillocky &gt;16%, 0-50 m

26. CREST/RIDGES: a. Shape: Irregular b. Length: Moderately long c. Variability: Low

d. Width: moderate

e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Slopes, dystropepts, 90%

-2- Upper slopes, dystrandeps, 10%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

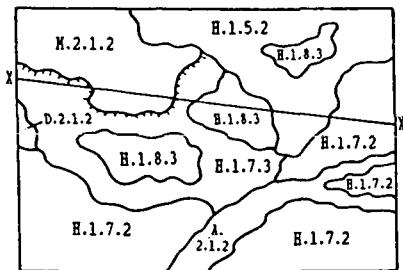
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 1 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 1

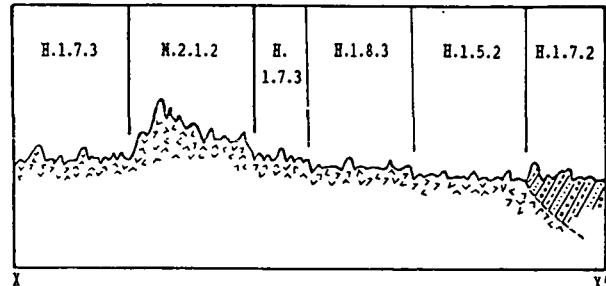
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 2 29: 1

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hb.1:8.3

2. MAP SHEET: 0618

3. AREA: 25 km<sup>2</sup>

4. OCCURENCE by PROVINCE: DI Aceh: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected isolated hillock, intermediate and mafic lavas, slopes 16-25%

7. SATELLITE SCENES : 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 11F / -049,

9. RADAR : Star-I/250/88/0618-6.

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 25 %

- a. Weathering : Partial
- b. Lithology : andesitic lavas
- c. Formation : Tmvt

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Imundation: None

15. VEGETATION/LAND USE : moist primary lowland forest

Area used : 0 %

## 16. ACCELERATED EROSION

- a. Occurrence : Extensive
- b. Evidence : Gulleys

## 17. SOIL GREAT GROUP :

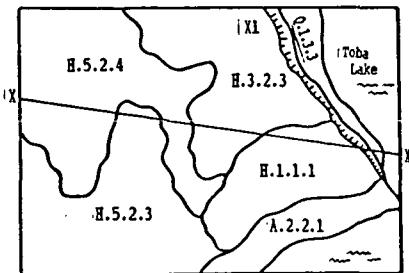
	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	90 %	yes
Associated 1	kanhapludults	10 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

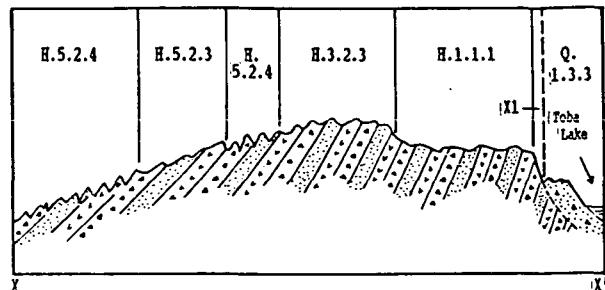
ity/	/	/	/dk/0618/	/	/10/	udh/	/	/	/0618/	/	/	/
/	/	/	/dn/0618/	/	/9/							



## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hu.3.2.3

2. MAP SHEET: 0618

3. AREA: 69 km<sup>2</sup>

4. OCCURENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 30/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected complex hilly relief, mixed sedimentary rock, moderately step slopes (16-30%)

7. SATELLITE SCENES : 128/58/08/08/85,

8. AERIAL PHOTOGRAPHS : 1:100.000 135 /8323-117, 145 /8319-117,

9. RADAR : STAR-I/250/88/0618-4

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 0 %

a. Weathering : High

b. Lithology : sandstone, dacite, diatomite

c. Formation : Qps

12. WATER a. Quality : Fresh

b. Source : Rain

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Imundation: None

15. VEGETATION/LAND USE : , bush, shifting cultivation, upland crops, reafforestation, towns, villages

Area used : 70 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	eutropepts	65 %	yes
Associated 1	dystropepts	35 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

ite/ / 87/LH/0618/61/ /44 / ity/ / 88/LH/0618/62/ /81 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	moderately coarse moderately fine	-- --
b. Depth:	peatsoil -- mineralsoil very deep	-- very deep	-- --
c. Drainage:		Well drained	Well drained
d. Exch. K:	topsoil very high subsoil very high	medium low	-- --
e. Total K2O:	topsoil very high subsoil very high	very high very high	-- --
f. Avail. P:	method Bray I topsoil very low subsoil low	Bray I very low very low	-- --
g. Total P:	topsoil low subsoil very low	low low	-- --
h. CEC pH 7	topsoil low subsoil medium	low low	-- --
i. Soil Reaction:	topsoil excessive acid subsoil strong acid	excessive acid very strong acid	-- --
j. Al Sat.	topsoil very low subsoil very low	very high very high	-- --
k. Al toxicity :	--	yes	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	--	--
p. Organic Matter :	1.0	2.6	0.0
q. TEB :	18.1	0.9	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 1300 m Minimum: 950 m Range: 1000 m

20. PLAN/PROFILE: Dominant: non-linear and random 40-60% of area flat-topped  
Included: non-linear and random < 40% of area flat-topped

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high

c. Variability: low

22. SLOPE: a. Steepness:mod. steep b. Variability: Medium  
c. Length: moderate d. Variability: Low

e. Curvature: straight

23. SLOPE DISTR.: Valleybottoms: 5 %

Interfluves : 0-8%: 0 %, 9-25%: 85 %, 25-55%: 10 %

24. RELIEF AMPLI.: a. Amplitude: high b. Variability: Medium

25. TERRAIN: Hilly &gt;16%, 51-300m

26. CREST/RIDGES: a. Shape: Irregular b. Length:Short c. Variability: Medium  
d. Width: narrow e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Upper slopes (crest), dystropepts, 35%

-2- Midle &amp; lower slopes, eutropepts, 65%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

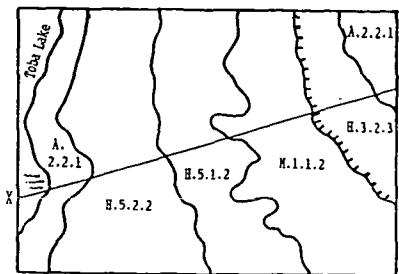
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 1 14.a: 1 14.b: 1 17: 1 18.a: 2 18.b: 2 18.c: 2

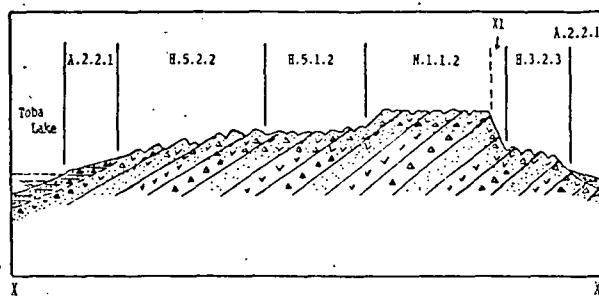
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hu.5.1.2      2. MAP SHEET: 0618      3. AREA: 131 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 30/05/89      Status: Final
6. LAND UNIT DESCRIPTION: Moderately dissected dip slope, mixed sedimentary rocks, slope 8-15%.
7. SATELLITE SCENES : 128/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 135 /8323-115, 135 /8323-117, 135 /8323-113
9. RADAR : STAR-I/250/88/0618-4
10. PARENT MATERIAL      11. ROCK OUTCROP: %
- a. Weathering : High
  - b. Lithology : sandstone, dacite
  - c. Formation : Qps
12. WATER a. Quality : Fresh  
b. Source : Rain
13. FISHERIES : None
14. RIVERS a. Floodrisk : None  
b. Inundation: Not known
15. VEGETATION/LAND USE : bush, savanna (savana), grazing land, shifting cultivation, upland crops, irrigated wetland rice (irigasi), rainfed wetland rice; reafforestation, towns, villages
- Area used : 50 %
16. ACCELERATED EROSION
- a. Occurrence : Extensive
  - b. Evidence : Gulleys

17. SOIL GREAT GROUP	Classification	% of area	Lab. checked
Dominant >50%	eutropepts	60 %	yes
Associated 1	dystropepts	30 %	yes
Associated 2	humitropepts	10 %	yes

## 32. REPRESENTATIVE PROFILES:

ite/	/	/87/LH/0618/61/	/38/	ith/	/	/87/LH/0618/62/	/47/
ity/	/	/87/LH/0618/61/	/40/				

**18. SOIL CHARACTERISTICS**

Properties	Dominant > 50%	Associated 1	Associated 2
a. Texture: topsoil	moderately fine	moderately fine	fine
subsoil	fine	fine	fine
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	very deep
c. Drainage:	Well drained	Well drained	Well drained
d. Exch. K:	topsoil subsoil	high medium	medium low
e. Total K2O:	topsoil subsoil	very high very high	very high very high
f. Avail. P:	method topsoil subsoil	Bray I very low very low	Bray I very low very low
g. Total P:	topsoil subsoil	low very low	low very low
h. CEC pH 7	topsoil subsoil	medium medium	medium low
i. Soil Reaction:	topsoil subsoil	excessive acid very strong acid	excessive acid excessive acid
j. Al Sat.	topsoil subsoil	very low very low	very high very high
k. Al toxicity :	--	no	no
l. Acid sulph. pot.:	--	--	very shallow
m. Salinity :	salt free	salt free	salt free
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	160 cm	120 cm
p. Organic Matter :	1.9	1.8	3.7
q. TEB :	18.8	0.7	3.1
r. Total observations:	1	1	1

**19. ALTITUDE:** Maximum: 1600 m      Minimum: 1250 m      Range: 1500 m**20. PLAN/PROFILE:** Dominant: linear and parallel > 60% of area flat-topped

Included:

**21. L.U. DRAINAGE:** a. Pattern: parallel      b. density: Moderate

c. Variability: low

**22. SLOPE:** a. Steepness:sloping      b. Variability: Medium

c. Length: moderate

d. Variability: Low

e. Curvature: convex

**23. SLOPE DISTR.:** Valleybottoms: 10 %

Interfluves : 0-8%:15 %, 9-25%: 75 %, 25-55%: 0 %

**24. RELIEF AMPLI.:** a. Amplitude: low      b. Variability: Medium**25. TERRAIN:** Rolling 9-15%, 0-50 m**26. CREST/RIDGES:** a. Shape: Level      b. Length: Moderately long      c. Variability: Low

d. Width: moderate      e. Variability: Low

**27. VALLEY FLOOR:** a. Width: very narrow      b. Variability: Low**28. LAND FACETS:** -1- Mid & lower slopes, eutropepts, 60%

-2- Upper slopes, dystropepts, 30%

-3- Valley floor, humitropepts, 10%

-4-

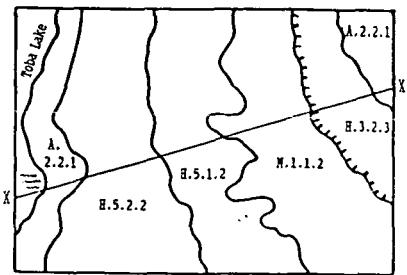
**29. FRAGMENTATION:** Valleys: Small blocks      Interfluves: Small blocks**30. RELIABILITY:** 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2    12.a: 2    14.a: 1    14.b: 1    17: 1    18.a: 1    18.b: 2    18.c: 2

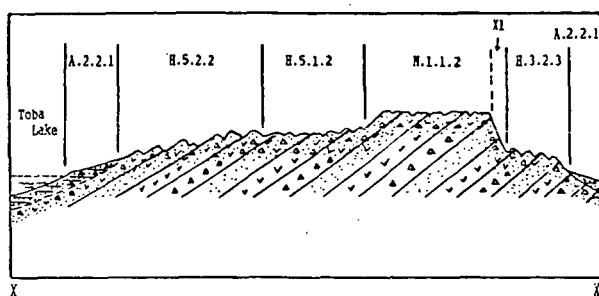
18.d-q: 2    19: 2    22: 2    23: 2    24: 2    28: 2    29: 2

**31. ADDITIONAL NOTES:**

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hu.5.2.2

2. MAP SHEET: 0618

3. AREA: 78 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 30/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Moderately dissected dip slopes mixed sedimentary rocks, slope 16-30%.

7. SATELLITE SCENES : 128/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 135 /8323-115, 135 /8323-117,

9. RADAR : STAR-I/250/82/0618-4

## 10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : High

b. Lithology : sandstone, dacite, conglomerate

c. Formation : Qps

12. WATER a. Quality : Fresh

b. Source : Rain

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , bush, alang-alang, grazing land, upland crops rainfed wetland rice, reafforestation

Area used : 30 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab: checked
Dominant >50%	eutropepts	60 %	yes
Associated 1	dystropepts	40 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

site/ / 87/1h/0618/34/ 044/ city/ / 87/1h/0618/62/ 036/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	moderately coarse moderately fine	-- --
b. Depth:	peatsoil -- mineralsoil very deep	-- very deep	-- --
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil very high subsoil very high	medium low	-- --
e. Total K2O:	topsoil very high subsoil very high	very high very high	-- --
f. Avail. P:	method Bray I topsoil very low subsoil low	Bray I very low very low	-- --
g. Total P:	topsoil low subsoil very low	low low	-- --
h. CEC pH 7	topsoil low subsoil medium	low low	-- --
i. Soil Reaction:	topsoil excessive acid subsoil strong acid	excessive acid very strong acid	-- --
j. Al Sat.	topsoil very low subsoil very low	medium high	-- --
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	104 cm	--
p. Organic Matter :	1.0	2.3	0.0
q. TEB :	18.1	1.4	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 1200 m Minimum: 900 m Range: 1000 m

20. PLAN/PROFILE: Dominant: linear and parallel > 60% of area flat-topped  
Included:21. L.U. DRAINAGE: a. Pattern: parallel b. density: Moderate  
c. Variability: low22. SLOPE: a. Steepness: mod. steep b. Variability: Medium  
c. Length: moderate d. Variability: Low  
e. Curvature: straight23. SLOPE DISTR.: Valleybottoms: 10 %  
Interfluvies : 0-8%:25 %, 9-25%: 65 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Medium

25. TERRAIN: hillocky &gt;16%, 0-50 m

26. CREST/RIDGES: a. Shape: Level b. Length: Moderately long c. Variability: Low  
d. Width: moderate e. Variability: Low

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Mid &amp; lower slopes, eutropepts, 60%

-2- Upper slopes, dystropepts, 40%

-3-

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluvies: Small blocks

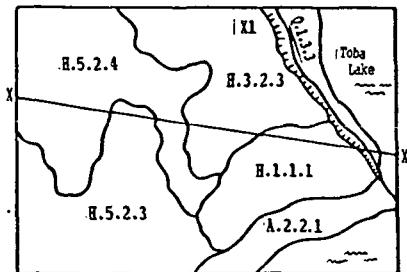
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

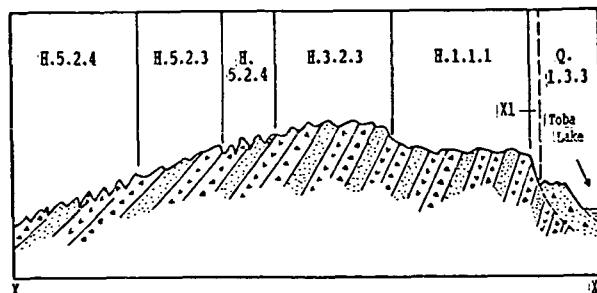
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 2 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hu.5.2.3

2. MAP SHEET: 0618

3. AREA: 99 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 27/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected dip. slopes, mixed sediment rocks, slopes 16-30%

7. SATELLITE SCENES : 128/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 135 /8323-117, 145 /8319-117

9. RADAR : STAR-I/250/88/0618-4

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 5 %

a. Weathering : High

b. Lithology : sandstone, dacite, conglomerate

c. Formation : Ops

12. WATER a. Quality : Fresh

b. Source : Rain

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , bush, shifting cultivation, upland crops, reafforestation

Area used : 70 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	eutropepts	70 %	yes
Associated 1	dystropepts	30 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

ite/ / 87/LH/0618/34/ /44 / ity/ / 87/LH/0618/34/ /36 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	fine	moderately coarse	--
subsoil	fine	moderately fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil very high	medium	--
subsoil	very high	low	--
e. Total K2O:	topsoil very high	very high	--
subsoil	very high	very high	--
f. Avail. P:	method Bray I	Bray I	
topsoil	very low	very low	--
subsoil	low	very low	--
g. Total P:	topsoil low	low	--
subsoil	very low	low	--
h. CEC pH 7	topsoil low	low	--
subsoil	medium	low	--
i. Soil Reaction:	topsoil excessive acid	excessive acid	--
subsoil	strong acid	very strong acid	--
j. Al Sat.	topsoil very low	medium	--
subsoil	very low	high	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	104 cm	--
p. Organic Matter :	1.0	2.3	0.0
q. TEB :	18.1	1.4	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 1200 m Minimum: 950 m Range: 1000 m

20. PLAN/PROFILE: Dominant: linear and parallel &gt; 60% of area flat-topped

Included: linear and parallel 40-60% of area flat-topped

21. L.U. DRAINAGE: a. Pattern: parallel b. density: Mod. high  
c. Variability: low22. SLOPE: a. Steepness:mod. steep b. Variability: Medium  
c. Length: short d. Variability: Low  
e. Curvature: straight23. SLOPE DISTR.: Valleybottoms: 10 %  
Interfluves : 0-8%:20 %, 9-25%: 70 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: low b. Variability: Medium

25. TERRAIN: hillocky &gt;16%, 0-50 m

26. CREST/RIDGES: a. Shape: Irregular b. Length: Moderately long c. Variability: Low  
d. Width: moderate e. Variability: Low

27. VALLEY FLOOR: a. Width: narrow b. Variability: Medium

28. LAND FACETS: -1- Midle &amp; lower part, eutropepts, 70%

-2- Upper part, dystropepts, 30%

-3-

-4-

29. FRAGMENTATION: Valleys: Small blocks Interfluves: Small blocks

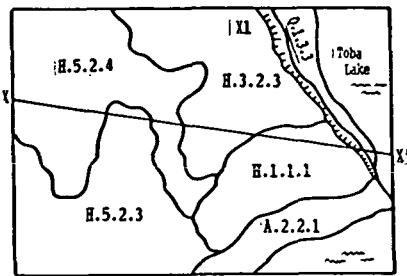
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

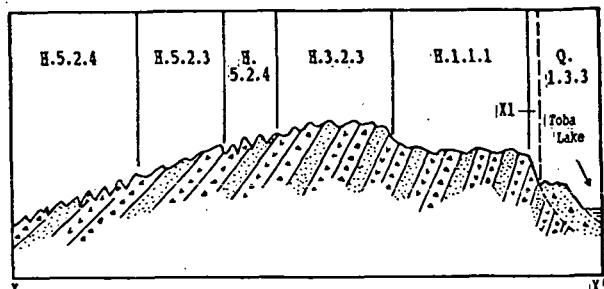
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 2 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Hu.5.2.4

2. MAP SHEET: 0618

3. AREA: 103 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Extremely dissected dip. slopes, mixed sedimentary rocks, slopes 16-30%.

7. SATELLITE SCENES : 128/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 135 /8323-117, 135 /8323-115,

9. RADAR : STAR-I/250/88/0618-4

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 5 %

a. Weathering : High

b. Lithology : diatomite, sandstone, conglomerate

c. Formation : Qps

12. WATER a. Quality : Fresh

b. Source : Rain, Medium wells

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : , bush, savanna (savana), grazing land, shifting cultivation, upland crops, irrigated wetland rice (irigasi), rainfed wetland rice, reafforestation

Area used : 40 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Various

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	eutropepts	60 %	yes
Associated 1	dystropepts	40 %	yes
Associated 2			

## 32. REPRESENTATIVE PROFILES:

site/ / 87/LH/0618/34/ /44 / ity/ / 87/LH/0618/34/ /36 /

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	moderately coarse moderately fine	-- --
b. Depth:	peatsoil -- mineralsoil very deep	-- very deep	-- --
c. Drainage:		Well drained	--
d. Exch. K:	topsoil very high subsoil very high	medium low	-- --
e. Total K2O:	topsoil very high subsoil very high	very high very high	-- --
f. Avail. P:	method Bray I topsoil very low subsoil low	Bray I very low very low	-- --
g. Total P:	topsoil low subsoil very low	low low	-- --
h. CEC pH 7	topsoil low subsoil medium	low low	-- --
i. Soil Reaction:	topsoil excessive acid subsoil strong acid	excessive acid very strong acid	-- --
j. Al Sat.	topsoil very low subsoil very low	medium high	-- --
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	104 cm	--
p. Organic Matter :	1.0	2.3	0.0
q. TEB :	18.1	1.4	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 1500 m Minimum: 1000 m Range: 1200 m

20. PLAN/PROFILE: Dominant: linear and parallel > 60% of area crested/peaked  
Included: linear and random > 60% of area crested/peaked21. L.U. DRAINAGE: a. Pattern: parallel b. density: High  
c. Variability: low22. SLOPE: a. Steepness:mod. steep b. Variability: Medium  
c. Length: short d. Variability: Low  
e. Curvature: straight23. SLOPE DISTR.: Valleybottoms: 15 %  
Interfluves : 0-8%:10 %, 9-25%: 75 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: medium b. Variability: Medium

25. TERRAIN: hillocky &gt;16%, 0-50 m

26. CREST/RIDGES: a. Shape: Irregular b. Length:Short c. Variability: Medium  
d. Width: moderate e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Medium

28. LAND FACETS: -1- Mid &amp; lower slopes, eutropepts, 60%

-2- Upper slopes, dystropepts, 40%

-3-

-4-

29. FRAGMENTATION: Valleys: Interfluves:

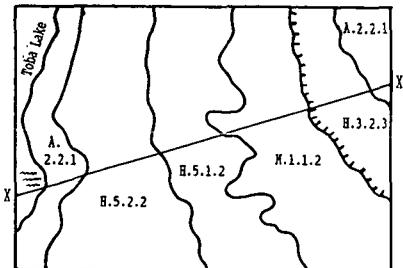
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

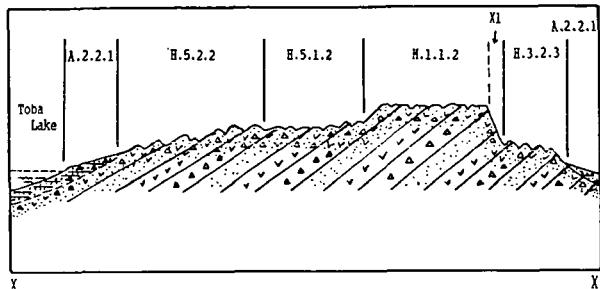
18.d-q: 2 19: 2 22: 3 23: 3 24: 2 28: 2 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Mu.1.1.2      2. MAP SHEET: 0618      3. AREA: 58 km<sup>2</sup>  
 4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%  
 5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/05/89      Status: Final  
 6. LAND UNIT DESCRIPTION: Moderately dissected flat to undulating plateaus, mixed sedimentary rocks, slopes 3 - 8 %.  
 7. SATELLITE SCENES : 128/58/08/08/85  
 8. AERIAL PHOTOGRAPHS : 1:100.000 135 /8323-113,  
 9. RADAR : Star-I/250/88/0618-4  
 10. PARENT MATERIAL      11. ROCK OUTCROP: %  
   a. Weathering : High  
   b. Lithology : , dacite, diatomite  
   c. Formation : Qps  
 12. WATER a. Quality : Fresh  
   b. Source : Rain, Perennial River  
 13. FISHERIES : None  
 14. RIVERS a. Floodrisk : None  
   b. Inundation: None  
 15. VEGETATION/LAND USE : , bush, upland crops, reafforestation  
   Area used : 60 %  
 16. ACCELERATED EROSION  
   a. Occurrence : Localised  
   b. Evidence : Gullies

## 17. SOIL GREAT GROUP

	Classification	% of area	Lab. checked
Dominant >50%	humitropepts	60 %	yes
Associated 1	eutropepts	40 %	yes
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

ith/ / 87/lh/0618/62/ /046/ ite/ / 87/lh/0618/61/ /038/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	fine	moderately fine	--
subsoil	fine	fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil medium	very high	--
subsoil medium	very high	very high	--
e. Total K2O:	topsoil very high	very low	--
subsoil very high	very low	very low	--
f. Avail. P:	method Bray I	Bray I	--
topsoil very low	very low	very low	--
subsoil very low	very low	very low	--
g. Total P:	topsoil low	low	--
subsoil low	very low	very low	--
h. CEC pH 7	topsoil medium	medium	--
subsoil medium	medium	medium	--
i. Soil Reaction:	topsoil excessive acid	excessive acid	--
subsoil excessive acid	very strong acid	very strong acid	--
j. Al Sat.	topsoil medium	very low	--
subsoil high	very low	very low	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	120 cm	--
p. Organic Matter :	4.1	1.9	0.0
q. TEB :	3.3	18.8	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 1650 m Minimum: 1500 m Range: 1500 m

20. PLAN/PROFILE: Dominant: linear and parallel > 60% of area flat-topped  
Included: linear and parallel < 40% of area crested/peaked

21. L.U. DRAINAGE: a. Pattern: parallel b. density: Moderate

c. Variability: low

22. SLOPE: a. Steepness: gently sloping b. Variability: Low  
c. Length: moderate d. Variability: Medium

e. Curvature: straight

23. SLOPE DISTR.: Valleybottoms: 5 %  
Interfluves : 0-8%:95 %, 9-25%: 0 %, 25-55%: 0 %

24. RELIEF AMPLI.: a. Amplitude: low b. Variability: Medium

25. TERRAIN: Undulating 2- 8%, 0-50 m

26. CREST/RIDGES: a. Shape: no crests b. Length: c. Variability:

d. Width: e. Variability:

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Plateaus, humitropepts, 60%

-2- Plateaus, eutropepts, 40%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves: Medium blocks

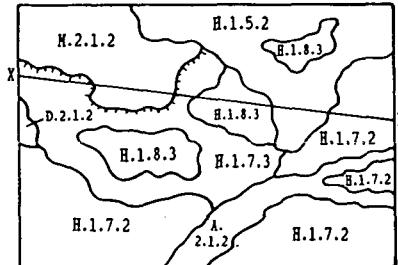
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 1 18.b: 2 18.c: 2

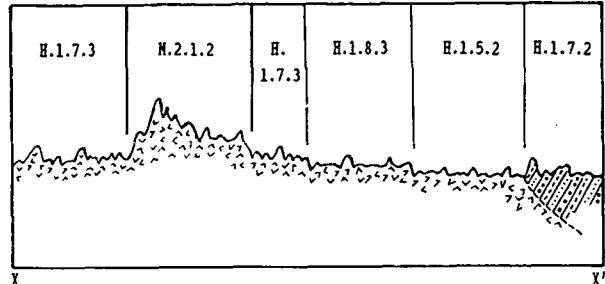
18.d-q: 2 19: 2 22: 1 23: 3 24: 1 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Mb.2.1.2

2. MAP SHEET: 0618

3. AREA: 123 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: DI Aceh: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Moderately dissected mountains, intermediate and mafic lavas, gentle to moderately steep slope (&lt;30%)

7. SATELLITE SCENES : 129/59/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 11f / -043,

9. RADAR : Star-I/250/88/0618-6

## 10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : High

b. Lithology : andesitic lavas, ,

c. Formation : Tmvt ,

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Imundation: None

15. VEGETATION/LAND USE : moist primary lowland forest

Area used : 0 %

## 16. ACCELERATED EROSION

a. Occurrence : Common

b. Evidence : Gulleys

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	99 %	yes
Associated 1		%	
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

ity/ / 87/as/0618/44/ /024/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	moderately fine fine	-- --
b. Depth:	peatsoil mineralsoil -- very deep	-- very deep	-- --
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil very low subsoil very low	low low	-- --
e. Total K2O:	topsoil very low subsoil very low	low very low	-- --
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	-- -- --
g. Total P:	topsoil very low subsoil very low	low very low	-- --
h. CEC pH 7	topsoil low subsoil low	medium low	-- --
i. Soil Reaction:	topsoil very strong acid subsoil very strong acid	excessive acid very strong acid	-- --
j. Al Sat.	topsoil medium subsoil medium	very high very high	-- --
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	125 cm	--	--
p. Organic Matter :	2.7	0.0	0.0
q. TEB :	3.3	0.0	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 500 m Minimum: 250 m Range: 400 m

20. PLAN/PROFILE: Dominant: non-linear and random 40-60% of area crested/peaked  
Included:

21. L.U. DRAINAGE:	a. Pattern: dendritic c. Variability: medium	b. density: Moderate
22. SLOPE:	a. Steepness:mod. steep c. Length: short e. Curvature: convex	b. Variability: Medium d. Variability: Medium
23. SLOPE DISTR.:	Valleybottoms: 0 % Interfluves : 0-8%:10 %, 9-25%: 70 %, 25-55%: 20 %	
24. RELIEF AMPLI.:	a. Amplitude: high	b. Variability: Medium
25. TERRAIN:	Mountainous >16%, >300m	
26. CREST/RIDGES:	a. Shape: Irregular d. Width: moderate	b. Length: Moderately long e. Variability: Medium c. Variability: Medium
27. VALLEY FLOOR:	a. Width: very narrow	b. Variability: Medium
28. LAND FACETS:	-1- Slopes, dystropepts, 99% -2- -3- -4-	

29. FRAGMENTATION: Valleys: None Interfluves:

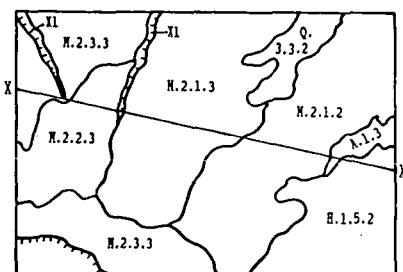
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

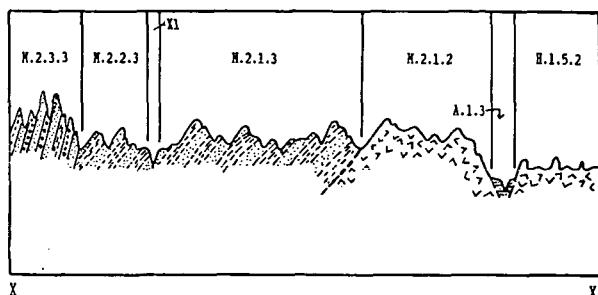
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

MAP IMAGE:



CROSS SECTION:



1. LAND UNIT: Mfq. 2.1.3      2. MAP SHEET: 0618      3. AREA: 162 km<sup>2</sup>  
 4. OCCURRENCE by PROVINCE: DI Aceh: 75%, Sumatera Utara: 25%  
 5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/05/89      Status: Final  
 6. LAND UNIT DESCRIPTION: Strongly dissected mountain, felsic fine and coarse sedimentary rocks, gentle to moderately steep slope (<30%)  
 7. SATELLITE SCENES : 129/58/08/08/85  
 8. AERIAL PHOTOGRAPHS : 1:100.000 10a / -048,  
 9. RADAR : Star-I/250/88/0618-3  
 10. PARENT MATERIAL      11. ROCK OUTCROP: %  
   a. Weathering : High  
   b. Lithology : sandstone, claystone,  
   c. Formation : Tlsb ,  
 12. WATER a. Quality : Fresh  
   b. Source : Rain, Perennial River  
 13. FISHERIES : None  
 14. RIVERS a. Floodrisk : None  
   b. Imundation: None  
 15. VEGETATION/LAND USE : moist primary lowland forest, bush, shifting cultivation  
   Area used : 0 %  
 16. ACCELERATED EROSION  
   a. Occurrence : Extensive  
   b. Evidence : Gullies

17. SOIL GREAT GROUP :	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	90 %	yes
Associated 1	hapludults	10 %	yes
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

uda/ / 87/mk/0618/23/ /002/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	moderately fine medium	-- --
b. Depth:	peatsoil -- mineralsoil very deep	-- moderately deep	-- --
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil very low subsoil very low	low very low	-- --
e. Total K2O:	topsoil very low subsoil low	low very low	-- --
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	-- -- --
g. Total P:	topsoil very low subsoil very low	very low very low	-- --
h. CEC pH 7	topsoil low subsoil low	low low	-- --
i. Soil Reaction:	topsoil very strong acid subsoil very strong acid	excessive acid excessive acid	-- --
j. Al Sat.	topsoil very high subsoil very high	very high very high	-- --
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	very deep	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	65 cm	--
p. Organic Matter :	3.0	1.3	0.0
q. TEB :	0.6	0.6	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 1000 m Minimum: 300 m Range: 500 m

20. PLAN/PROFILE: Dominant: non-linear and random > 60% of area crested/peaked  
Included:21. L.U. DRAIAGE: a. Pattern: dendritic b. density: Mod. high  
c. Variability: medium22. SLOPE: a. Steepness:mod. steep b. Variability: Medium  
c. Length: short d. Variability: Medium  
e. Curvature: compound23. SLOPE DISTR.: Valleybottoms: %  
Interfluves : 0-8%: 0 %, 9-25%: 70 %, 25-55%: 30 %

24. RELIEF AMPLI.: a. Amplitude: high b. Variability: Medium

25. TERRAIN: Mountainous &gt;16%, &gt;300m

26. CREST/RIDGES: a. Shape: Irregular b. Length:Short c. Variability: Medium

d. Width: moderate e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Middle slopes, hapludults, 10%

-2- Upper &amp; lower slopes, dystropepts, 90%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

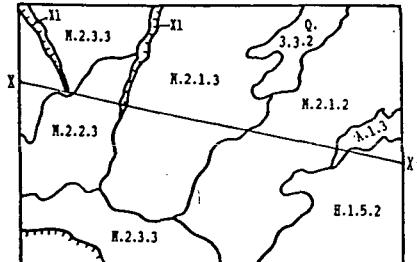
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

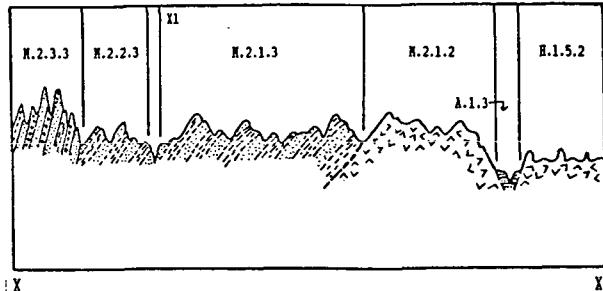
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Mfq.2.2.3

2. MAP SHEET: 0618

3. AREA: 178 km<sup>2</sup>

4. OCCURENCE by PROVINCE: DI Aceh: 52%, Sumatera Utara: 48%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected mountain felsic fine and coarse sedimentary rocks, steep to very steep slope (30-75%)

7. SATELLITE SCENES : 129/58/08/08 / 129/59/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 111, 11F / -043, 10c / -050

9. RADAR : Star-I/2 18-136

## 10. PARENT MATERIAL.

## 11. ROCK OUTCROP: %

a. Weathering : High

b. Lithology : clay, sandstone,

c. Formation : T

12. WATER a. Quality : fresh

b. Source Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : moist primary lowland forest, bush, rubber (karet)

Area used : 0 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Gullies

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	65 %	yes
Associated 1	humitropepts	25 %	yes
Associated 2	troporthents	10 %	yes

## 32. REPRESENTATIVE PROFILES:

ity/ /	/87/ah/0618/43/	/021/	ith/ /	/87/as/0618/43/	/022/
eot/ /	/87/tb/0618/ /	/71 /			

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	fine fine	coarse coarse
b. Depth:	peatsoil mineralsoil	-- very deep	-- very deep
c. Drainage:		Well drained	Excessively drained
d. Exch. K:	topsoil low subsoil very low	very low very low	very low very low
e. Total K2O:	topsoil low subsoil very low	very low very low	very low very low
f. Avail. P:	method topsoil very low subsoil very low	Bray I very low very low	Bray I very low very low
g. Total P:	topsoil very low subsoil very low	low low	very low very low
h. CEC pH 7	topsoil medium subsoil low	low low	very low very low
i. Soil Reaction:	topsoil excessive acid subsoil very strong acid	excessive acid excessive acid	very strong acid very strong acid
j. Al Sat.	topsoil very high subsoil very high	very high very high	very low very low
k. Al toxicity :	no	no	no
l. Acid sulph. pot.:	--	very deep	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	130 cm	140 cm	--
p. Organic Matter :	3.0	2.9	0.0
q. TEB :	0.6	0.8	0.0
r. Total observations:	2	1	1

19. ALTITUDE: Maximum: 800 m Minimum: 250 m Range: 800 m

20. PLAN/PROFILE: Dominant: linear and random > 60% of area crested/peaked  
Included:

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high  
c. Variability: medium

22. SLOPE: a. Steepness:Steep b. Variability: Medium  
c. Length: short d. Variability: Medium  
e. Curvature: compound

23. SLOPE DISTR.: Valleybottoms: %  
Interfluves : 0-8%: 0 %, 9-25%: 20 %, 25-55%: 60 %, >55%: 20 %

24. RELIEF AMPLI.: a. Amplitude: very high b. Variability: Medium

25. TERRAIN: Mountainous >16%, >300m

26. CREST/RIDGES: a. Shape: Irregular b. Length:Short c. Variability: Medium  
d. Width: narrow e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Upper & mid slopes, dystropepts, 65%

-2- Lower slopes, humitropepts, 25%

-3- Crest, troporthents, 10%

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

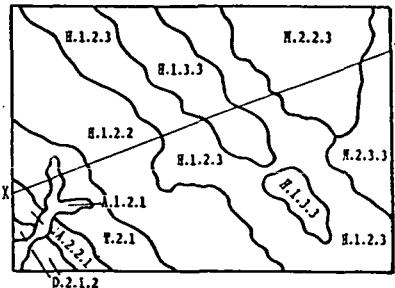
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

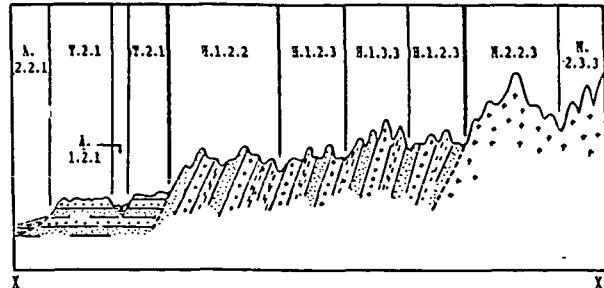
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Mg.2.2.3

2. MAP SHEET: 0618

3. AREA: 31 km<sup>2</sup>

4. OCCURENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected mountains, acid plutonic rock, steep to very steep slope (30-75%)

7. SATELLITE SCENES : 129/58/08/08/85,

8. AERIAL PHOTOGRAPHS : 1:100.000 10c / -053,

9. RADAR : Star\_1/250/88/0618-1

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 10 %

a. Weathering : High

b. Lithology : granite

c. Formation : MPisL

12. WATER a. Quality : Fresh

b. Source : Rain

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : moist primary lowland forest

Area used : 0 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Gulleys

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	75 %	yes
Associated 1	tropopsammets	25 %	yes
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

ity/ / /87/gd/0618/ / /36 / est/ / /87/MR/0618/ / /02 /

**18. SOIL CHARACTERISTICS**

Properties	Dominant > 50%	Associated 1	Associated 2
a. Texture:	topsoil moderately fine	coarse	--
	subsoil moderately coarse	coarse	--
b. Depth:	peatsoil --	--	--
	mineralsoil deep	very deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil very low	very low	--
	subsoil very low	very low	--
e. Total K2O:	topsoil very low	very high	--
	subsoil medium	very high	--
f. Avail. P:	method Bray I	Bray I	
	topsoil very low	very low	--
	subsoil very low	very low	--
g. Total P:	topsoil very low	low	--
	subsoil low	low	--
h. CEC pH 7	topsoil medium	medium	--
	subsoil low	medium	--
i. Soil Reaction:	topsoil very strong acid	very strong acid	--
	subsoil very strong acid	strong acid	--
j. Al Sat.	topsoil low	low	--
	subsoil very low	very low	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	92 cm	146 cm	--
p. Organic Matter :	0.0	7.6	0.0
q. TEB :	0.0	0.8	0.0
r. Total observations:	0	0	0

19. ALTITUDE: Maximum: 900 m Minimum: 300 m Range: 500 m

20. PLAN/PROFILE: Dominant: non-linear and random > 60% of area crested/peaked  
Included:

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high

c. Variability: medium

22. SLOPE: a. Steepness:Steep b. Variability: Medium  
c. Length: short d. Variability: Medium  
e. Curvature: convex23. SLOPE DISTR.: Valleybottoms: 5 %  
Interfluvies : 0-8%: 0 %, 9-25%: 10 %, 25-55%: 65 %, >55%: 20 %

24. RELIEF AMPLI.: a. Amplitude: very high b. Variability: Medium

25. TERRAIN: Mountainous &gt;16%, &gt;300m

26. CREST/RIDGES: a. Shape: Irregular b. Length: Moderately long c. Variability: Medium  
d. Width: narrow e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Upper & Mid. slopes, dystropepts, 75%  
-2- Lower slopes & Valley, tropopsammements, 25%  
-3-  
-4-

29. FRAGMENTATION: Valleys: None Interfluvies:

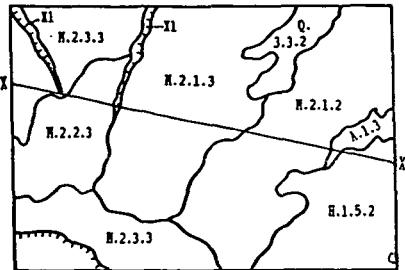
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 1 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

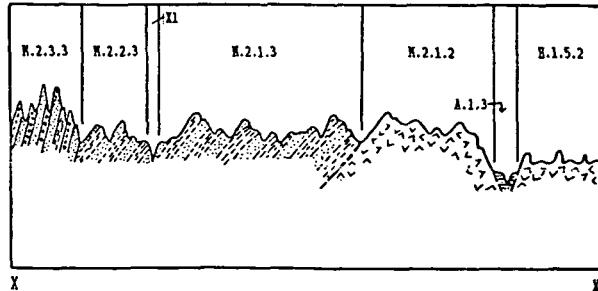
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES: All representative profiles are extrapolated from Mg. 2.2.3

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Mu.2.2.3

2. MAP SHEET: 0618

3. AREA: 594 km2

4. OCCURRENCE by PROVINCE: Sumatera Utara: 15%, DI Aceh: 85%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected mountains, mixed sedimentary rocks, steep to very steep slopes (30-75%)

7. SATELLITE SCENES : 129/58/08/08/85,

8. AERIAL PHOTOGRAPHS : 1:100.000 145 /8347-085, 12D / -066, 12D / -064

9. RADAR : Star-I/250/88/0618-4,6

## 10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : High

b. Lithology : sandstone, shale, conglomerate

c. Formation : Pub

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : moist primary lowland forest, bush, shifting cultivation

Area used : 0 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Gullies

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	humitropepts	70 %	yes
Associated 1	troporthents	30 %	yes
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

ith/ / /87/d /0618/51/ /014/ eot/ / /87/ah/0618/51/ /016/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	medium	coarse	--
subsoil	medium	coarse	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil low	very low	--
subsoil	low	very low	--
e. Total K2O:	topsoil medium	very low	--
subsoil	medium	very low	--
f. Avail. P:	method Bray I	Bray I	
topsoil	very low	very low	--
subsoil	very low	very low	--
g. Total P:	topsoil very low	very low	--
subsoil	very low	very low	--
h. CEC pH 7	topsoil low	low	--
subsoil	low	very low	--
i. Soil Reaction:	topsoil very strong acid	excessive acid	--
subsoil	very strong acid	excessive acid	--
j. Al Sat.	topsoil low	high	--
subsoil	low	medium	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	125 cm	130 cm	--
p. Organic Matter :	3.3	0.9	0.0
q. TEB :	1.0	0.5	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 900 m Minimum: 300 m Range: 700 m

20. PLAN/PROFILE: Dominant: linear and random &gt; 60% of area crested/peaked

Included:

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high

c. Variability: medium

22. SLOPE: a. Steepness: very steep b. Variability: Medium

c. Length: short

d. Curvature: compound

23. SLOPE DISTR.: Valleybottoms: 10 % Interfluves : 0-8%: 0 %, 9-25%: 20 %, 25-55%: 50 %, &gt;55%: 20 %

24. RELIEF AMPLI.: a. Amplitude: very high b. Variability: Medium

25. TERRAIN: Mountainous &gt;16%, &gt;300m

26. CREST/RIDGES: a. Shape: Irregular b. Length: Short c. Variability: Medium

d. Width: narrow

e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Crest, upp&amp;mid slopes, troporthents, 30%

-2- Lower slope&amp;valley, humitropepts, 70%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

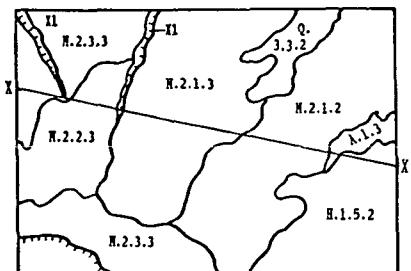
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 1

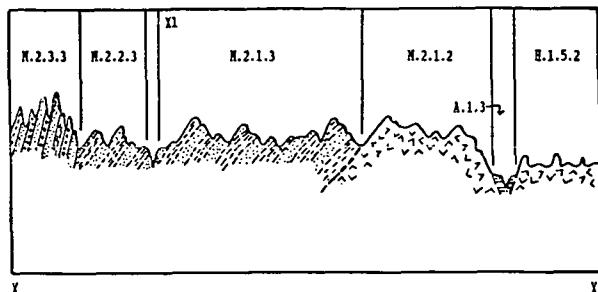
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Mfq. 2.3.3

2. MAP SHEET: 0618

3. AREA: 88 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: DI Aceh: 21%, Sumatera Utara: 79%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected mountains, felsic fine and coarse sedimentary rocks, abrupt slope (&gt;75%)

7. SATELLITE SCENES : 129/58/08/08/85

8. AERIAL PHOTOGRAPHS : 1:100.000 11F / -043,

9. RADAR : Star-I/250/88/0618-6

## 10. PARENT MATERIAL

11. ROCK OUTCROP: %

a. Weathering : High

b. Lithology : sandstone, claystone,

c. Formation : Tmba

## 12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

## 13. FISHERIES : None

## 14. RIVERS a. Floodrisk : None

b. Imndation: None

15. VEGETATION/LAND USE : moist primary lowland forest, bush, shifting cultivation  
Area used : 0 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Gullies

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	70 %	yes
Associated 1	humitropepts	30 %	yes
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

ity/ / /87/as/0618/43/ /021/ ith/ / /87/mr/0618/62/ /007/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	fine	moderately coarse	--
subsoil	fine	fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	very deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil very low	low	--
subsoil	very low	low	--
e. Total K2O:	topsoil very low	very high	--
subsoil	very low	very high	--
f. Avail. P:	method Bray I	Bray I	
topsoil	very low	very low	--
subsoil	very low	very low	--
g. Total P:	topsoil low	very low	--
subsoil	low	very low	--
h. CEC pH 7	topsoil low	low	--
subsoil	low	low	--
i. Soil Reaction:	topsoil excessive acid	strong acid	--
subsoil	very strong acid	strong acid	--
j. Al Sat.	topsoil very high	high	--
subsoil	very high	medium	--
k. Al toxicity :	--	no	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	125 cm	140 cm	--
p. Organic Matter :	2.7	2.8	0.0
q. TEB :	0.5	0.8	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 800 m Minimum: 250 m Range: 500 m

20. PLAN/PROFILE: Dominant: linear and random &gt; 60% of area crested/peaked

Included:

21. L.U. DRAINAGE:	a. Pattern: dendritic	b. density: Mod. high
22. SLOPE:	c. Variability: medium	
	a. Steepness:extremely steep	b. Variability: High
	c. Length: very short	d. Variability: Medium
	e. Curvature: compound	
23. SLOPE DISTR.:	Valleybottoms: 5 %	
	Interfluves : 0-8%: 0 %, 9-25%: 0 %, 25-55%: 20 %, >55%: 75 %	
24. RELIEF AMPLI.:	a. Amplitude: very high	b. Variability: Medium
25. TERRAIN:	Mountainous >16%, >300m	
26. CREST/RIDGES:	a. Shape: Irregular	b. Length:Short
	d. Width: narrow	c. Variability: Medium
	e. Variability: Medium	
27. VALLEY FLOOR:	a. Width: very narrow	b. Variability: Medium
28. LAND FACETS:	-1- Upper & middle slopes, dystropepts, 70%	
	-2- Lower s & valley floor, humitropepts, 30%	
	-3-	
	-4-	
29. FRAGMENTATION:	Valleys: None	Interfluves:

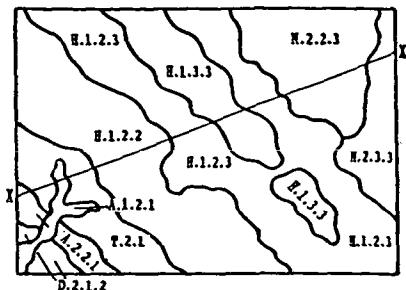
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 1

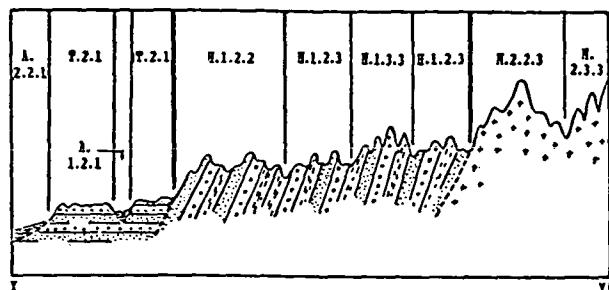
18.d-q: 2 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Mg.2.3.3

2. MAP SHEET: 0618

3. AREA: 119 km<sup>2</sup>

4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected mountains, acid plutonic rocks, abrupt slopes (&gt;75%)

7. SATELLITE SCENES : 129/59/08/08/85,

8. AERIAL PHOTOGRAPHS : 1:100.000 12b / -008, 12b / -010,

9. RADAR : Star-I/250/88/0618-1

## 10. PARENT MATERIAL

## 11. ROCK OUTCROP: %

a. Weathering : High

b. Lithology : granite

c. Formation : MPisl

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Inundation: None

15. VEGETATION/LAND USE : moist primary lowland forest, bush, alang-alang

Area used : 0 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Gullies

## 17. SOIL GREAT GROUP :

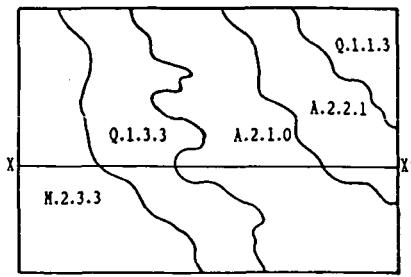
	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	60 %	yes
Associated 1	troposammets	40 %	yes
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

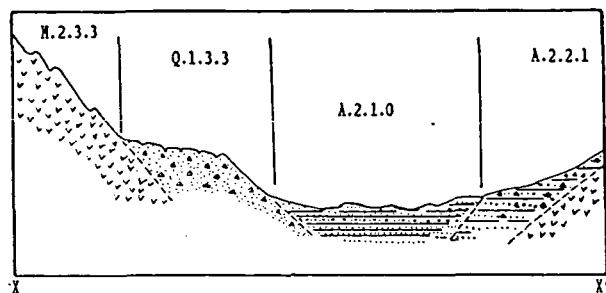
ity/ / 87/GD/0618/ / 36 / est/ / 87/MR/0618/ / 02 /



## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Ma.2.3.3      2. MAP SHEET: 0618      3. AREA: 210 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: Sumatera Utara: 99%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/05/89      Status: Final
6. LAND UNIT DESCRIPTION: Strongly dissected mountains, intermediate and mafic tuffs, abrupt slopes, (>75%)
7. SATELLITE SCENES : 128/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 T2 /8323-155, T2 /8323-157,
9. RADAR : star-I/250/88/0618-1
10. PARENT MATERIAL      11. ROCK OUTCROP: 20 %
- a. Weathering : High
  - b. Lithology : andesitic tuffs
  - c. Formation : Tmva
12. WATER a. Quality : Fresh  
b. Source : Rain, Perennial River
13. FISHERIES : None
14. RIVERS a. Floodrisk : None  
b. Inundation: None
15. VEGETATION/LAND USE : moist primary submontane forest  
Area used : 0 %
16. ACCELERATED EROSION  
a. Occurrence : Extensive  
b. Evidence : Gullies

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	75 %	yes
Associated 1	eutropepts	25 %	no
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

ity/ / /87/gd/0618/32/ /032/	ity/ / /87/gd/0618/ / /012/
ity/ / /87/jh/0618/ / /035/	

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	fine	fine	--
subsoil	fine	fine	--
b. Depth: peatsoil	--	--	--
mineralsoil	deep	very deep	--
c. Drainage:	Moderately well	Well drained	--
d. Exch. K:	topsoil subsoil	low very low	-- --
e. Total K2O:	topsoil subsoil	low low	-- --
f. Avail. P:	method topsoil subsoil	Bray I low very low	-- -- --
g. Total P:	topsoil subsoil	very high very high	-- --
h. CEC pH 7	topsoil subsoil	medium low	-- --
i. Soil Reaction:	topsoil subsoil	excessive acid excessive acid	very strong acid strong acid
j. Al Sat.	topsoil subsoil	very high very high	-- --
k. Al toxicity :	yes	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	--	--	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	130 cm	130 cm	--
p. Organic Matter :	1.8	0.0	0.0
q. TEB :	0.9	0.0	0.0
r. Total observations:	3	1	0

19. ALTITUDE: Maximum: 1600 m Minimum: 1000 m Range: 1300 m

20. PLAN/PROFILE: Dominant: non-linear and random > 60% of area crested/peaked  
Included:

21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high

c. Variability: medium

22. SLOPE: a. Steepness: extremely steep b. Variability: High  
c. Length: short d. Variability: Medium

e. Curvature: compound

23. SLOPE DISTR.: Valleybottoms: 5 % Interfluves : 0-8%: 0 %, 9-25%: 0 %, 25-55%: 25 %, &gt;55%: 70 %

24. RELIEF AMPLI.: a. Amplitude: very high b. Variability: Medium

25. TERRAIN: Mountainous &gt;16%, &gt;300m

26. CREST/RIDGES: a. Shape: Irregular b. Length: Short c. Variability: Medium  
d. Width: narrow e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability: Low

28. LAND FACETS: -1- Crest up&amp;mdl slopes, dystropepts, 75%

-2- Lower lopes&amp;valley, eutropepts, 25%

-3-

-4-

29. FRAGMENTATION: Valleys: None Interfluves:

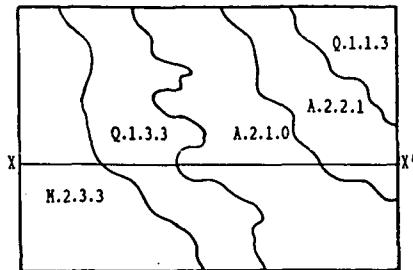
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 3 18.a: 2 18.b: 2 18.c: 2

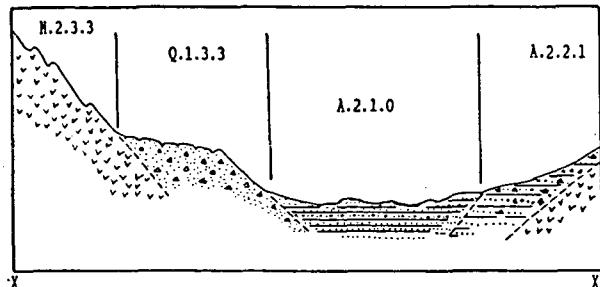
18.d-q: 3 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Mb.2.3.3

2. MAP SHEET: 0618

3. AREA: 58 km<sup>2</sup>

4. OCCURENCE by PROVINCE: DI Aceh: 28%, Sumatera Utara: 72%

5. STATUS IDENTIFIERS : Updated by: DR edit date: 05/05/89 Status: Final

6. LAND UNIT DESCRIPTION: Strongly dissected mountains, intermediate and mafic lavas, abrupt slope (&gt;75%)

7. SATELLITE SCENES : 128/58/08/08/85,

8. AERIAL PHOTOGRAPHS : 1:100.000 16A / -027, 11F / -047,

9. RADAR : Star-I/250/88/0618-4,6

## 10. PARENT MATERIAL

11. ROCK OUTCROP: 10 %

a. Weathering : High

b. Lithology : andesitic lavas

c. Formation : Tmvh

12. WATER a. Quality : Fresh

b. Source : Rain, Perennial River

13. FISHERIES : None

14. RIVERS a. Floodrisk : None

b. Immdation: None

15. VEGETATION/LAND USE : moist primary submontane forest, bush, shifting cultivation, towns, villages

Area used : 20 %

## 16. ACCELERATED EROSION

a. Occurrence : Extensive

b. Evidence : Gullies

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	90 %	yes
Associated 1	hapludults	10 %	yes
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

ity/ / 87/lh/0618/64/ /025/ uda/ / 87/as/0618/43/ /020/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture:	topsoil fine subsoil fine	moderately fine fine	--
b. Depth:	peatsoil -- mineralsoil very deep	-- moderately deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	topsoil medium subsoil very low	very low very low	--
e. Total K2O:	topsoil low subsoil very low	very low very low	--
f. Avail. P:	method Bray I topsoil very low subsoil very low	Bray I very low very low	--
g. Total P:	topsoil very high subsoil very high	very low very low	--
h. CEC pH 7	topsoil high subsoil medium	low low	--
i. Soil Reaction:	topsoil excessive acid subsoil excessive acid	strong acid strong acid	--
j. Al Sat.	topsoil very high subsoil very high	low low	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	75 cm	--
p. Organic Matter :	4.3	2.3	0.0
q. TEB :	0.6	2.4	0.0
r. Total observations:	1	1	0

19. ALTITUDE: Maximum: 1500 m Minimum: 1100 m Range: 1300 m

20. PLAN/PROFILE: Dominant: linear and random > 60% of area crested/peaked  
Included:

21. L.U. DRAINAGE:	a. Pattern: dendritic c. Variability: medium	b. density: Mod. high
22. SLOPE:	a. Steepness: extremely steep c. Length: short e. Curvature: compound	b. Variability: Medium d. Variability: Medium
23. SLOPE DISTR.:	Valleybottoms: 10 % Interfluves : 0-8%:10 %, 9-25%: 20 %, 25-55%: 60 %	
24. RELIEF AMPLI.:	a. Amplitude: very high	b. Variability: Medium
25. TERRAIN:	Mountainous >16%, >300m	
26. CREST/RIDGES:	a. Shape: Irregular d. Width: narrow	b. Length:Short e. Variability: Medium c. Variability: Medium
27. VALLEY FLOOR:	a. Width: very narrow	b. Variability: Low
28. LAND FACETS:	-1- Crest, upp & low slope, dystropepts, 90% -2- Middle slope, hapludults, 10% -3- -4-	
29. FRAGMENTATION:	Valleys: None	Interfluves:

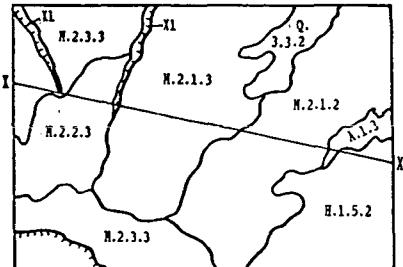
30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 1 12.a: 2 14.a: 1 14.b: 1 17: 3 18.a: 2 18.b: 2 18.c: 2

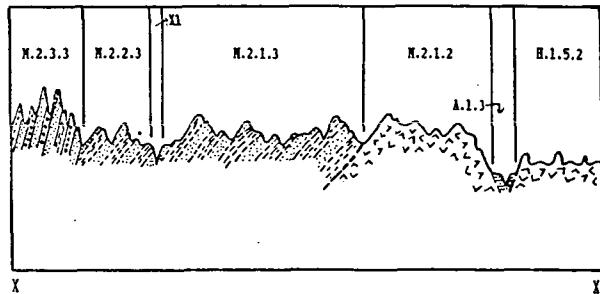
18.d-q: 3 19: 2 22: 2 23: 3 24: 2 28: 3 29: 2

31. ADDITIONAL NOTES:

## MAP IMAGE:



## CROSS SECTION:



1. LAND UNIT: Mu.2.3.3      2. MAP SHEET: 0618      3. AREA: 1468 km<sup>2</sup>
4. OCCURRENCE by PROVINCE: DI Aceh: 4%, Sumatera Utara: 96%
5. STATUS IDENTIFIERS : Updated by: DR      edit date: 05/05/89      Status: Final
6. LAND UNIT DESCRIPTION: Strongly dissected mountains, mixed sedimentary rocks, abrupt slopes (>75%)
7. SATELLITE SCENES : 129/58/08/08/85
8. AERIAL PHOTOGRAPHS : 1:100.000 145 /8347-087, T2 /8323-131, 12B / -002
9. RADAR : Star-I/250/88/0618-136
10. PARENT MATERIAL      11. ROCK OUTCROP: %
- a. Weathering : High
  - b. Lithology : dacite, sandstone, shale
  - c. Formation : Puk , Qvt
12. WATER a. Quality : Fresh  
b. Source : Rain, Perennial River
13. FISHERIES : None
14. RIVERS a. Floodrisk : None  
b. Inundation: None
15. VEGETATION/LAND USE : moist primary lowland forest, bush  
Area used : 0 %
16. ACCELERATED EROSION  
a. Occurrence : Extensive  
b. Evidence : Galleys

## 17. SOIL GREAT GROUP :

	Classification	% of area	Lab. checked
Dominant >50%	dystropepts	70 %	yes
Associated 1	humitropepts	30 %	yes
Associated 2		%	

## 32. REPRESENTATIVE PROFILES:

ity/ /	/87/pt/0618/54/ /14 /	ith/ /	/87/pt/0618/54/ /009/
ity/ /	/87/gd/0618/ / /016/	ity/ /	/87/jh/0618/ / /007/

**18. SOIL CHARACTERISTICS**

<b>Properties</b>	<b>Dominant &gt; 50%</b>	<b>Associated 1</b>	<b>Associated 2</b>
a. Texture: topsoil	moderately fine	moderately coarse	--
subsoil	fine	medium	--
b. Depth: peatsoil	--	--	--
mineralsoil	very deep	moderately deep	--
c. Drainage:	Well drained	Well drained	--
d. Exch. K:	high	high	--
subsoil	very low	very low	--
e. Total K2O:	topsoil high	very high	--
subsoil	very high	very high	--
f. Avail. P:	method Bray I	Bray I	--
topsoil	very low	very high	--
subsoil	very low	very low	--
g. Total P:	topsoil very high	high	--
subsoil	very high	very low	--
h. CEC pH 7	topsoil very high	very high	--
subsoil	high	low	--
i. Soil Reaction: topsoil	very strong acid	extreme acid	--
subsoil	strong acid	excessive acid	--
j. Al Sat.	topsoil medium	low	--
subsoil	low	very high	--
k. Al toxicity :	--	--	--
l. Acid sulph. pot.:	--	--	--
m. Salinity :	salt free	salt free	--
n. Other Toxicity:	--	--	--
o. Root obstr. layer :	120 cm	130 cm	--
p. Organic Matter :	6.6	31.0	0.0
q. TEB :	0.3	1.9	0.0
r. Total observations:	3	1	0

19. ALTITUDE: Maximum: 2050 m Minimum: 1700 m Range: 1800 m

20. PLAN/PROFILE: Dominant: linear and random > 60% of area crested/peaked  
Included: linear and random < 40% of area flat-topped21. L.U. DRAINAGE: a. Pattern: dendritic b. density: Mod. high  
c. Variability: medium22. SLOPE: a. Steepness: extremely steep b. Variability: High  
c. Length: short d. Variability: High  
e. Curvature: compound23. SLOPE DISTR.: Valleybottoms: 10 %  
Interfluves : 0-8%: 0 %, 9-25%: 0 %, 25-55%: 20 %, >55%: 70 %

24. RELIEF AMPLI.: a. Amplitude: very high b. Variability: Medium

25. TERRAIN: Mountainous &gt;16%, &gt;300m

26. CREST/RIDGES: a. Shape: Very irregular b. Length: Short c. Variability: High  
d. Width: narrow e. Variability: Medium

27. VALLEY FLOOR: a. Width: very narrow b. Variability:

28. LAND FACETS:  
-1- Crest, upp&mid slopes, dystropepts, 70%  
-2- Lower slopes & valleys, humitropepts, 30%  
-3-  
-4-

29. FRAGMENTATION: Valleys: Interfluves:

30. RELIABILITY: 1= reliable, 2= probable, 3= tenable, 4= plausible

10.b : 2 12.a: 2 14.a: 1 14.b: 1 17: 2 18.a: 2 18.b: 2 18.c: 2

18.d-q: 2 19: 2 22: 2 23: 2 24: 2 28: 3 29: 3

31. ADDITIONAL NOTES: