FLOOD HAZARD MAP OF ISAROG QUADRANGLE

MAP LEGEND:

Flood Hazard Zones:

- Regularly to Frequently Flooded Areas
- Occasionally to Rarely Flooded Areas
- Non Flood Prone Areas
- Areas Prone to Riverbank Erosion
- road
- railroad
- river
- mbound

EXPLANATIONS:
Flood hazard susceptibility zones were derived based on the geomorphological analysis of landforms and the fluvial system. Information on flood occurrences, flood depths, duration of inundation as well as topographic information supported the geomorphologically-based flood hazard mapping

Regularly to Frequently Flooded Areas:
Areas that are frequently flooded. Mere heavy rains of 1 to 2 days could bring about flooding in these areas. Moderate to strong typhoons could sumberge these areas 0.5 to 2.0 m. in flood waters for a few days to a few weeks. Development of urban settlements in these areas is not recommended.

Occasionally to Rarely Flooded Areas:
Areas that become inundated during moderate to strong typhoons. Flood depths vary from a few centimeters to 1 m. Floods last from a few hours to a few days

Non Flood Prone Areas:
Areas with no reported flood occurrences except along low lying areas adjoining rivers and creeks.

Areas Prone to Riverbank Erosion:

Field data collection by: A. E. Dayao
Geomorphological interpretation by: A.E.Dayao
Digital cartographic processing by: A.E. Dayao
GIS processing by: A.E. Dayao
Checked by: R.A. Juan
Approved by: R.A. Juan

Other sources of Information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos

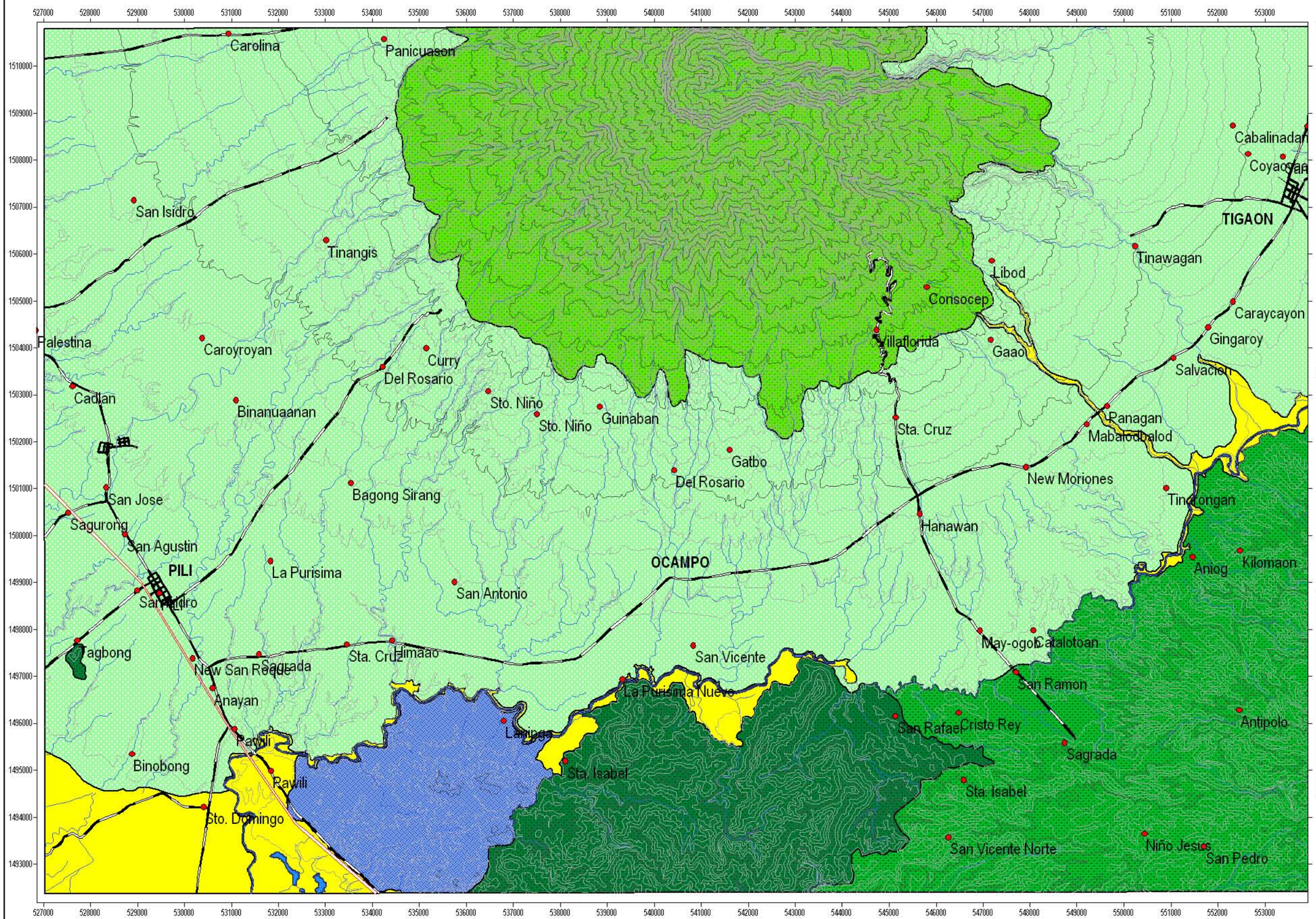
Published by:
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU-RO5
Daraga, Albay
2006

0 4250 m

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
Clarke 1866, Luzon Datum

N

GEOLOGIC MAP OF MT. ISAROG QUADRANGLE



LEGEND:

Geologic Time	Rock Formation
QUATERNARY	Quaternary Alluvium
	Isarog Volcanic Pyroclastics
	Isarog Volcanics
	Sagñay Volcanics
TERTIARY – Miocene I Pliocene	Pawili Limestone
	Baao Volcanics

MAP SYMBOLS:

- Road
- Railroad
- Contour Line
- River

Field data gathering by:A.E.Dayao
Data analysis by:A.E.Dayao
Digital cartographic processing by: A.E.Dayao
Checked by: A.F.Jusi
Approved by:R.A.Juan

Other Source of Information"
1:50,000 scale NAMRIA Topographic Map
1951 B/W Aerial Photographs

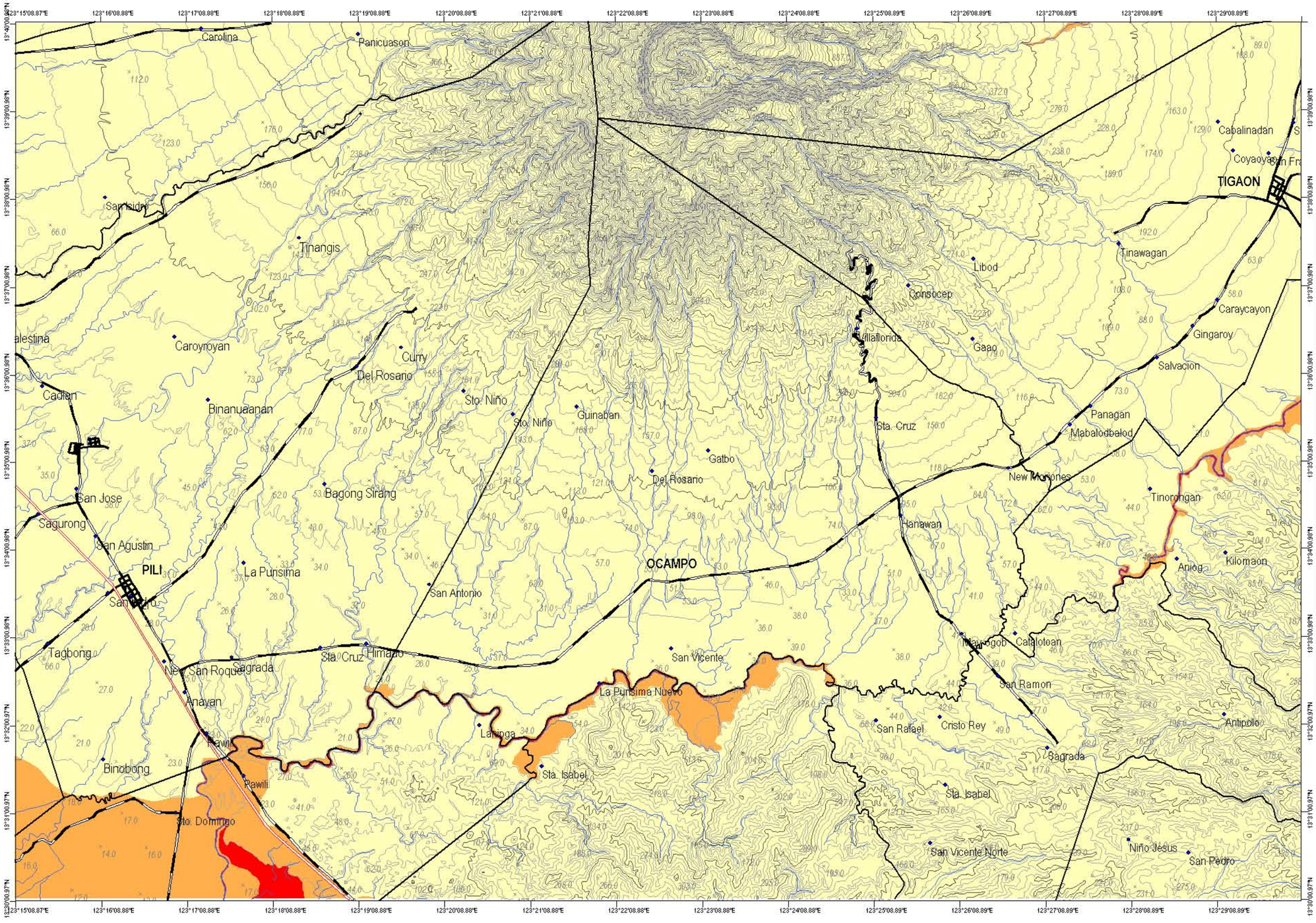
N

UNIVERSAL TRANSVERSE MERCATOR
Clarke 1866, Luzon Datum

0 — 8500

1 : 85000

LIQUEFACTION POTENTIAL MAP OF ISAROG QUADRANGLE



MAP LEGEND:

Liquefaction Potential Zones:

- Areas where liquefaction is likely
- Areas where liquefaction is possible
- Areas where liquefaction is not likely

- road
- railroad
- river
- mbound

EXPLANATIONS:
There are no reported liquefaction occurrences in the mapped area based on several field interviews. However, zones of different liquefaction potential were derived based on the geomorphological analysis of the study area following previous studies made by Iwasaki and Yasuda.

Areas where Liquefaction is Likely:
Areas where liquefaction is likely include river beds, old or abandoned river beds, oxbow lakes and oxbow lake margins. These areas are unsuitable for urban development. Multi-storey buildings should be required of geotechnical studies addressing or mitigating the effects of liquefaction.

Areas where Liquefaction is Possible:
The floodplains of the Bicol River and the fluvial levees and terraces and the alluvial plains are areas where liquefaction is possible. Buildings having 5 storeys or more should be required a full geotechnical study.

Areas where Liquefaction is not Likely:
Areas where the likelihood of liquefaction is unlikely.

Field data collection by: A. E. Dayao
Geomorphological interpretation by: A.E.Dayao
Digital cartographic processing by: A.E. Dayao
GIS processing by: A.E. Dayao
Checked by: R.A. Juan
Approved by: R.A. Juan

Other sources of Information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos

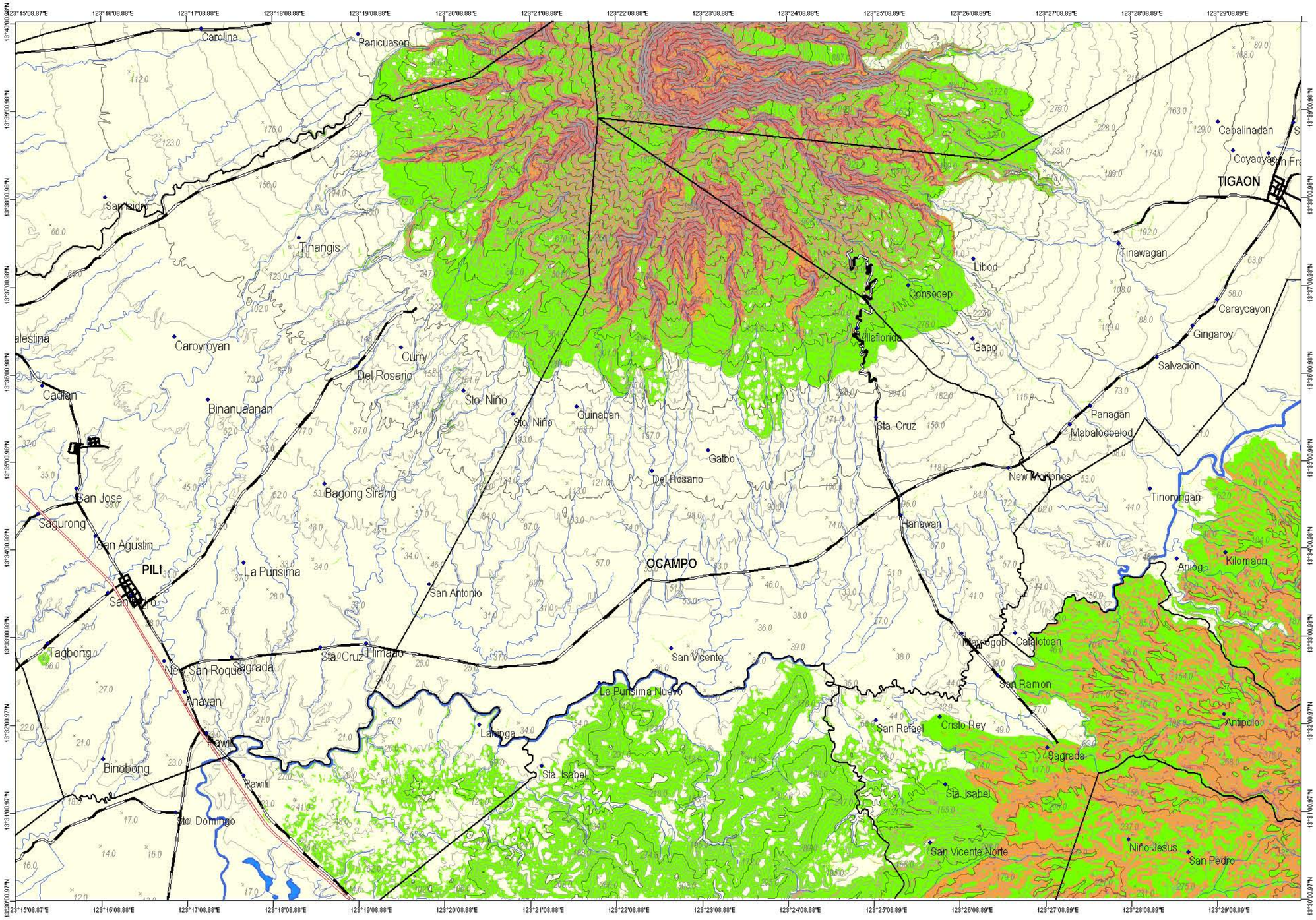
Published by:
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU-RO5
Daraga, Albay
2006

0 4250 m

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
Clarke 1866, Luzon Datum

N

LANDSLIDE SUSCEPTIBILITY MAP OF ISAROG QUADRANGLE



MAP LEGEND:

Landslide Susceptibility Zones:

- Absent
- Low Susceptibility to Landslides
- Moderate Susceptibility to Landslides
- High Susceptibility to Landslides
- road
- railroad
- river
- mbound

EXPLANATIONS:

Landslide hazard susceptibility zones were derived through qualitative map combination using lithology, geomorphology, slope gradient, road distance and fault distance. GIS was used in the map combination and subjective weights were assigned to each unit in the parameter map.

Areas with High Susceptibility to Landslides:
Areas with equally high probability of occurrence of mass movements particularly rock fall, rock slides, debris slides and slumps. The crater walls and the volcanic ravines and gullies of Mt. Isarog and the very steep to nearly vertical slopes underlain by pyroclastics of Sagñay Volcanics are rated high susceptibility areas and are unsuitable for housing development and human settlement.

Areas with Moderate Susceptibility to Landslides:
Areas having moderate likelihood of occurrence of landslides and are recommended for more detailed engineering geological and geohazard assessment prior to housing development.

Areas with Absent or Low Susceptibility to

Field data collection by: A. E. Dayao
Geomorphological interpretation by: A.E.Dayao
Digital cartographic processing by: A.E. Dayao
GIS processing by: A.E. Dayao
Checked by: R.A. Juan
Approved by: R.A. Juan

Other sources of Information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos

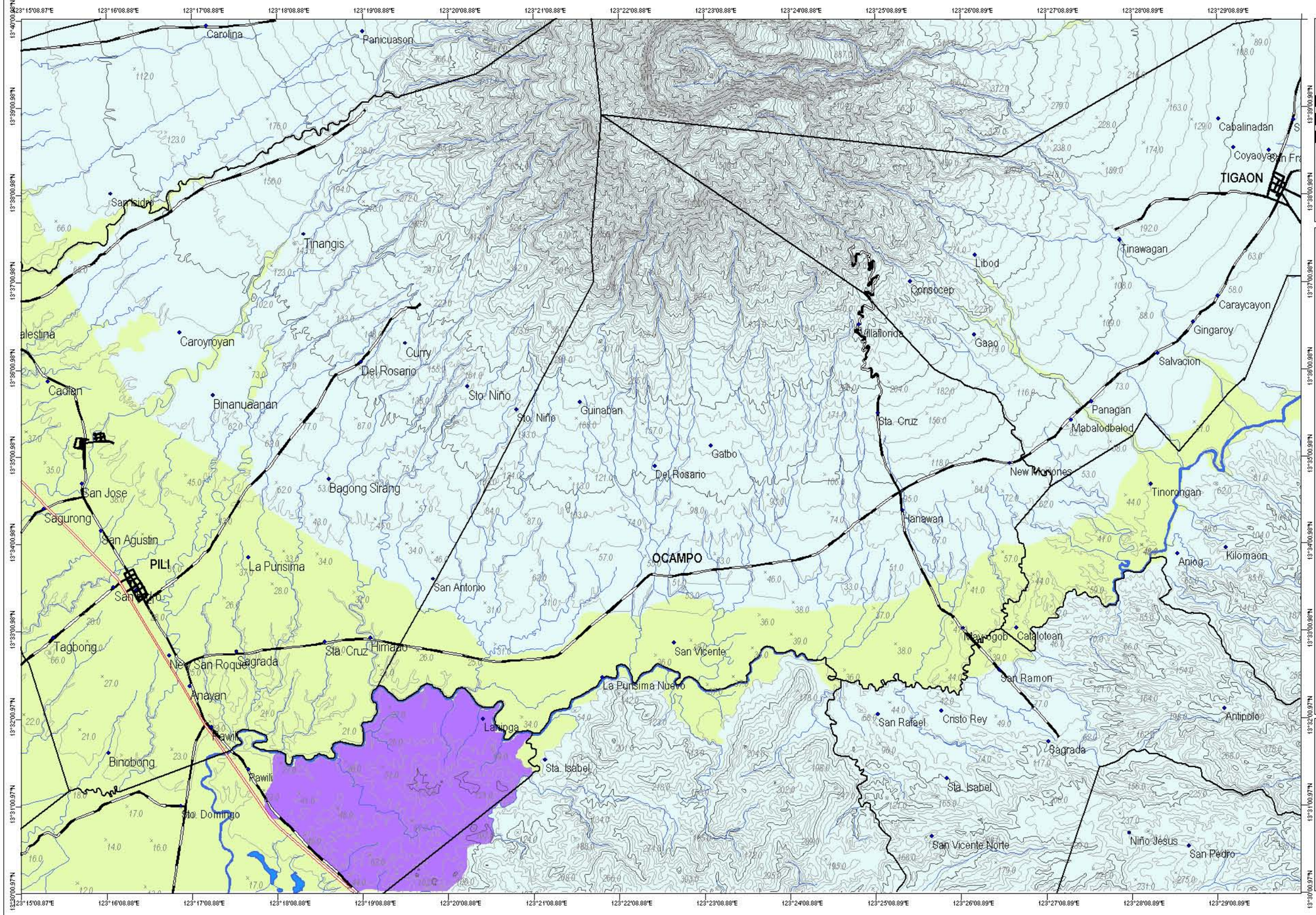
Published by:
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU-RO5
Daraga, Albay
2006

0 4250 m

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
Clarke 1866, Luzon Datum

N

GROUND SUBSIDENCE AND GROUND SETTLEMENT SUSCEPTIBILITY MAP OF ISAROG QUADRANGLE



MAP LEGEND:
Ground Settlement and Ground Subsidence Susceptibility Zones:

- Areas susceptible to ground settlement
- Areas susceptible to ground subsidence
- Areas not prone to ground settlement/subsidence
- road
- railroad
- river
- mbound

EXPLANATIONS:
Susceptibility map for ground subsidence due to karst or solution processes was primarily derived from the lithologic map of the study area. Field observations on sinkholes and ground subsidence observed on concrete roads and damaged houses supported the mapping. Areas of possible ground settlement were delineated through the analysis of the geomorphological lay of the study area, the sub-surface soils and the ground water levels.

Areas Susceptible to Ground Subsidence:
Areas that are prone to ground cavitation, sinkhole formation and ground subsidence in areas underlain by limestone and calcareous siltstones and shales.

Areas Susceptible to Ground Settlement:
Areas where fluviatile sands, silts and clays coupled with shallow ground water table are sites of possible ground settlement. Ground settlement may be reduced through appropriate foundation design. Buildings having 3 storeys or more should be tested for settlement and/or consolidation. Buildings having 5 storeys or more should undergo detailed geotechnical studies.

Field data collection by: A. E. Dayao
Geomorphological interpretation by: A.E.Dayao
Digital cartographic processing by: A.E. Dayao
GIS processing by: A.E. Dayao
Checked by: R.A. Juan
Approved by: R.A. Juan

Other sources of Information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos

Published by:
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU-RO5
Daraga, Albay
2006

0 4250 m

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
Clarke 1866, Luzon Datum

N