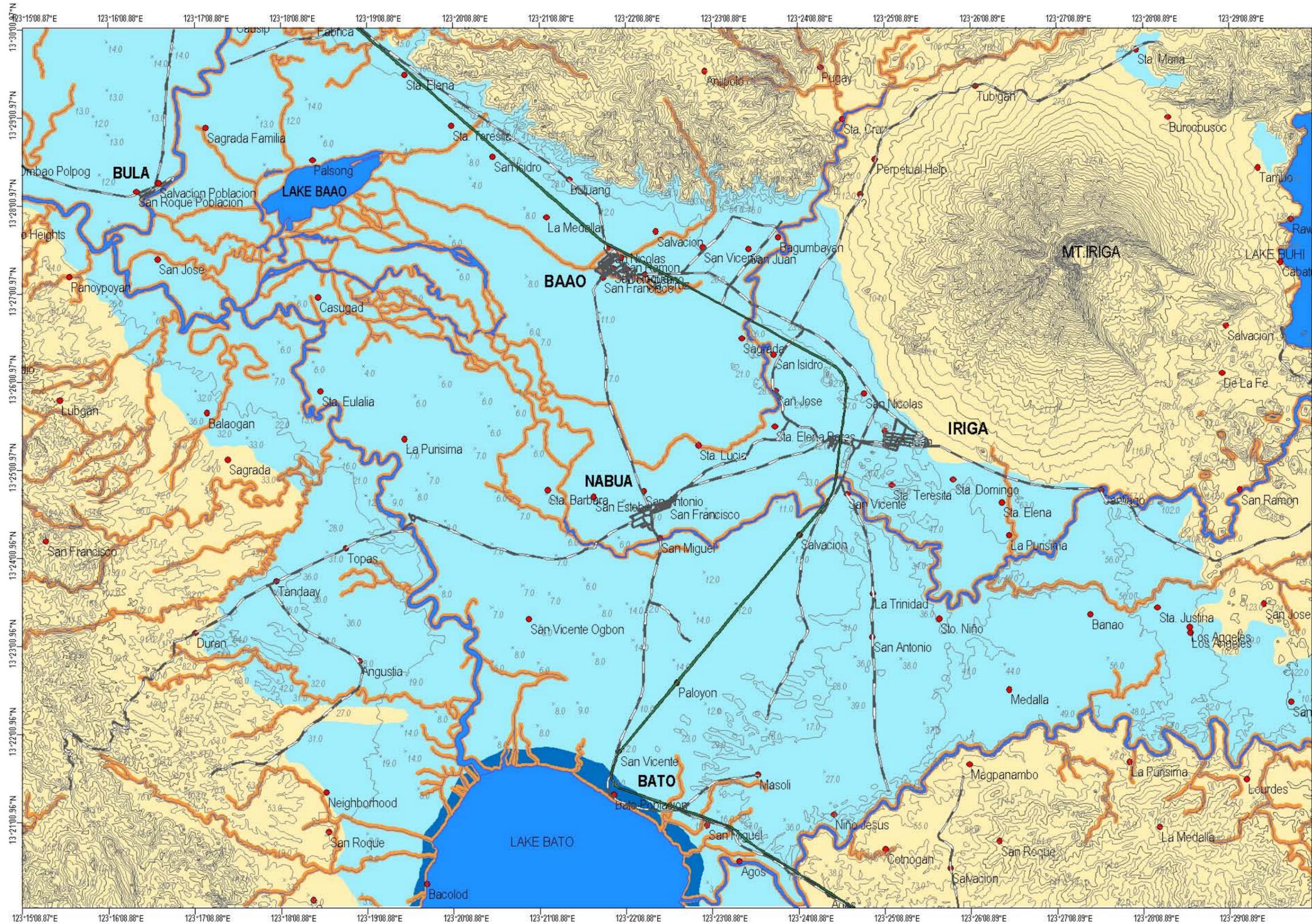


FLOOD HAZARD MAP OF IRIGA CITY QUADRANGLE



LEGEND:

Flood Hazard Zones:

- Non Flood Prone Areas
- Occasionally to Rarely Flooded Areas
- Regularly to Frequently Flooded Areas
- Areas Prone to Bank Erosion

Symbols:

- road
- railroad
- river
- fault

EXPLANATIONS:

Flood hazard susceptibility zones were derived based on the geomorphological analysis of landforms and 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 submerge these areas 0.5 to 2.0 m. in flood waters for a few days to a few weeks. This type of floods occurs on lake margins, the backswamps and fluvial basins and on abandoned river channels. Housing development in these areas is not recommended.

Occasionally to Rarely Flooded Areas:
Areas that become inundated during moderate to strong typhoons with high intensity-long duration rains. Flood depths vary from a few centimeters to 1 m. Floods last from a few hours to a few days.

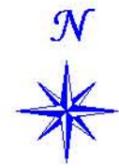
Non Flood Prone Areas:
Areas with no known or reported flood occurrences except low lying areas adjoining rivers and creeks.

Areas Prone to Bank Erosion
Areas 0 to 50 m. from river banks where scouring and erosion could occur.

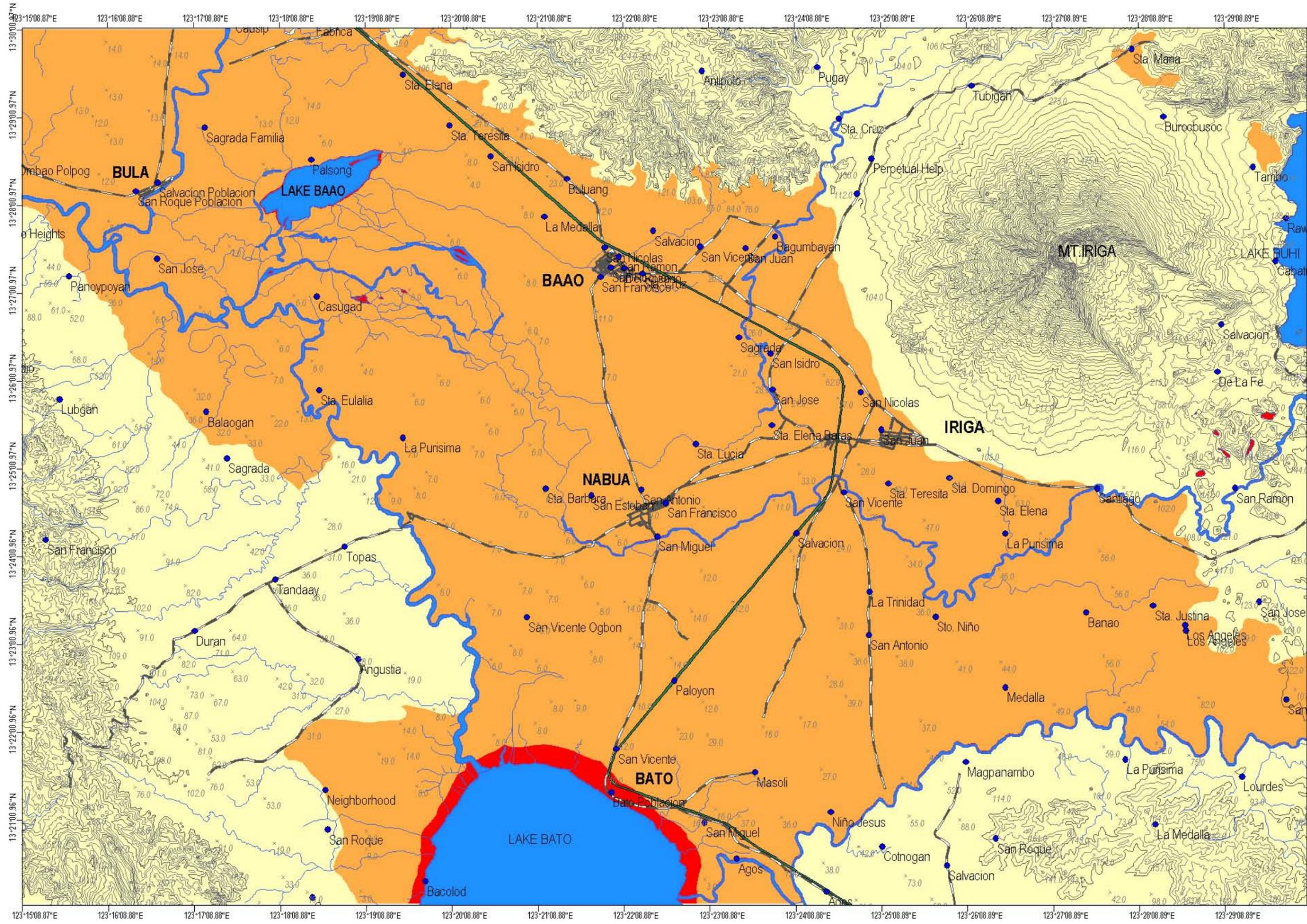
Field data collection by: M.R.M. Rint
 Geomorphological Interpretation by: M.R.M. Rint
 GIS processing by: M.R.M. Rint
 Digital cartographic processing by: M.R.M. Rint & B. Malto
 Checked by: A.E. Dayao
 Approved by: R.A. Juan

Other Sources of Information:
 1:50,000 scale NAMRIA Topographic Map

Published by:
 Department of Environment & Natural Resources
MINES & GEOSCIENCES BUREAU
 Regional Office No. 5
 2007



LIQUEFACTION POTENTIAL MAP OF IRIGA CITY QUADRANGLE



MAP LEGEND:

Liquefaction Potential Zones:

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

Symbols:

- road
- railroad
- river
- fault

EXPLANATIONS:

There are no reported liquefaction occurrences based on several field interviews. However, zones of different liquefaction potential were derived based on the geomorphological analysis of the study area following methodology by Iwasaki and Yasuda.

Areas where Liquefaction is Likely:
 Areas where liquefaction is likely include riverbeds, old or abandoned riverbeds and meanders, lakes and lake margins. These areas are not suitable for housing development. Multi-storey buildings should be required geotechnical studies addressing or mitigating the possible effects of liquefaction.

Areas where Liquefaction is Possible:
 Pyroclastic plains and flood plains where groundwater table is relatively shallow and subsurface soils are silty to sandy are areas where liquefaction is possible. Buildings of 5 storeys or more should be required geotechnical studies to determine and mitigate possible effects of liquefaction.

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

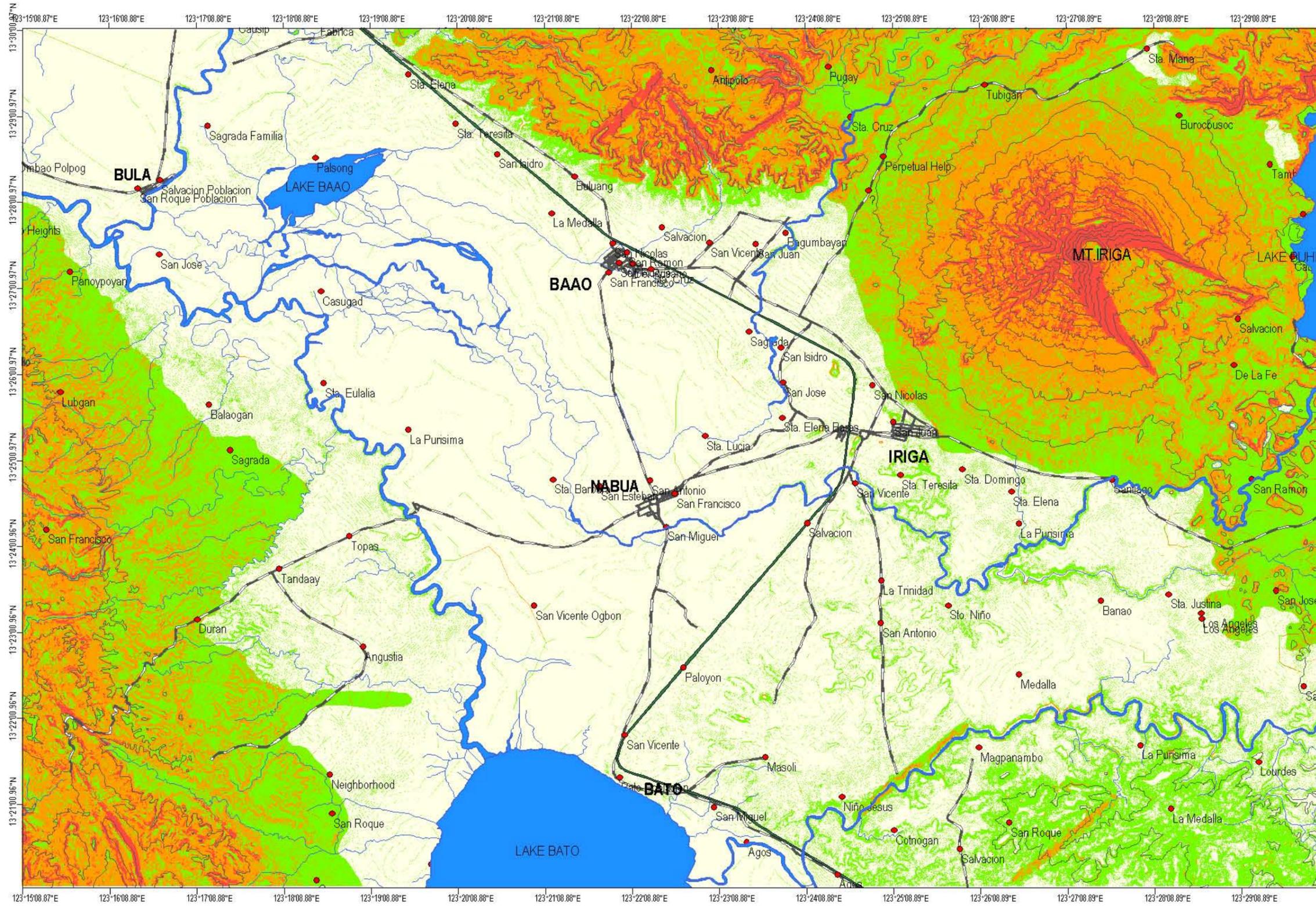
Field data collection by: M.R.M. Rint
 Geomorphological Interpretation by: M.R.M. Rint
 GIS processing by: M.R.M. Rint
 Digital cartographic processing by: M.R.M. Rint & B. Malto
 Checked by: A.E. Dayao
 Approved by: R.A. Juan

Other Sources of Information:
 1:50,000 scale NAMRIA Topographic Map
 1951 B/W Aerial Photographs scale 1:44,000

Published by:
 Department of Environment & Natural Resources
MINES & GEOSCIENCES BUREAU
 Regional Office No. 5
 2007



LANDSLIDE SUSCEPTIBILITY MAP OF IRIGA CITY QUADRANGLE



MAP LEGEND:

Landslide Susceptibility Zones:

- Absent
- Low susceptibility to absent
- Moderate susceptibility
- High susceptibility

road
 railroad
 river
 fault

EXPLANATIONS:

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

Areas with High Susceptibility to Landslides:
 Areas with equally high probability of occurrence of mass movements particularly debris slides and debris flows. Very steep to extremely steep slopes and areas along the crater rim and volcanic ravines and gullies are rated high susceptibility areas. Areas under high susceptibility are unsuitable for 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.

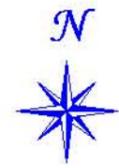
Areas with Low Susceptibility to Landslides:
 Areas where the likelihood of landslide is low. These areas maybe used for habitation as long as other geologic hazards are rated absent or low.

Areas where Landslide Susceptibility is Absent:
 Areas where threat of landslide is absent.

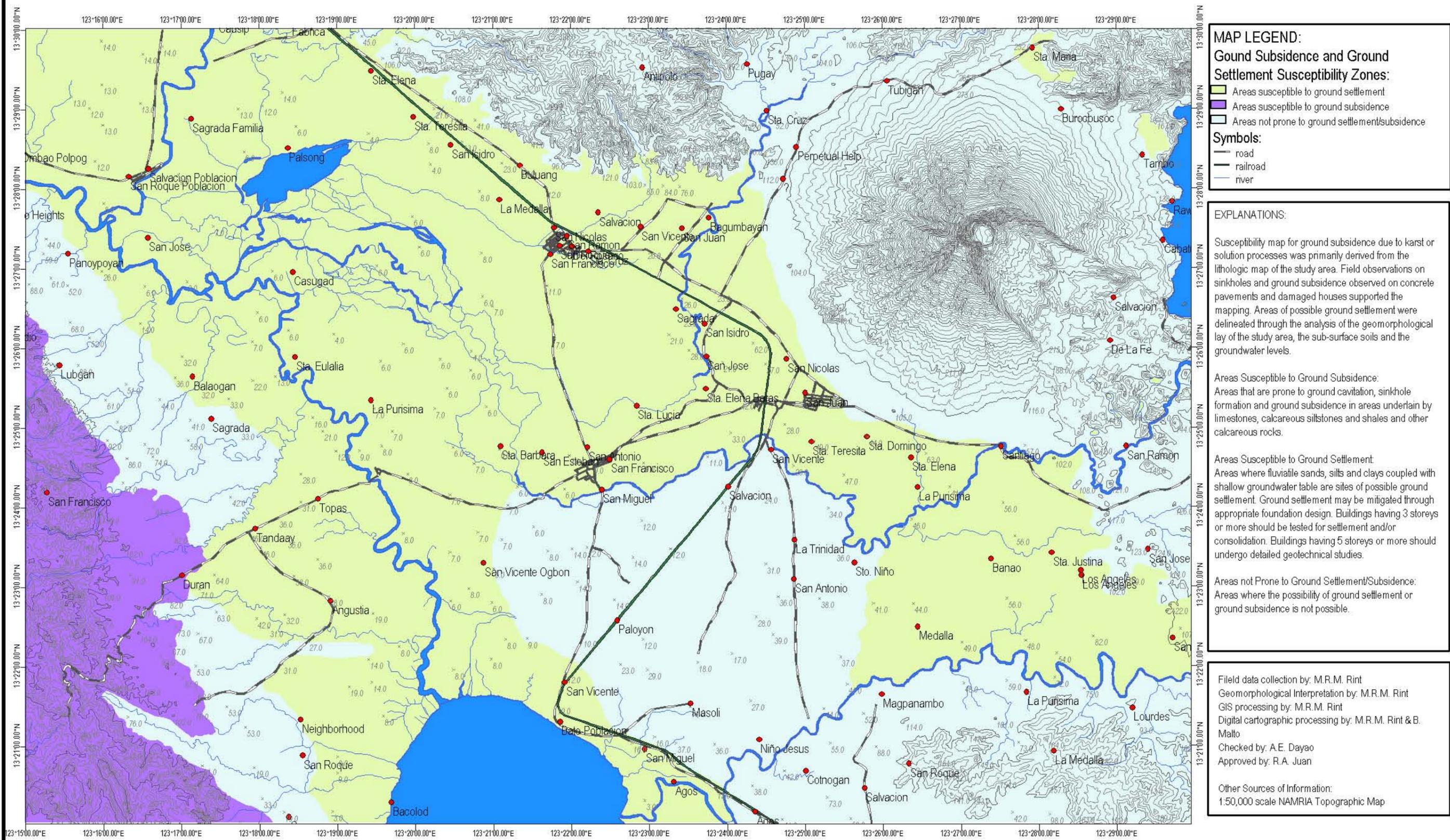
Filed data collection by: M.R.M. Rint
 Geomorphological Interpretation by: M.R.M. Rint
 GIS processing by: M.R.M. Rint
 Digital cartographic processing by: M.R.M. Rint & B. Malto
 Checked by: A.E. Dayao
 Approved by: R.A. Juan

Other Sources of Information:
 1:50,000 scale NAMRIA Topographic Map
 1961 RAW Aerial Photographs scale 1:44,000


 Published by:
 Department of Environment & Natural Resources
MINES & GEOSCIENCES BUREAU
 Regional Office No. 5
 2007



GROUND SUBSIDENCE AND GROUND SETTLEMENT SUSCEPTIBILITY MAP OF IRIGA CITY QUADRANGLE



MAP LEGEND:

Ground Subsidence and Ground Settlement Susceptibility Zones:

- Areas susceptible to ground settlement
- Areas susceptible to ground subsidence
- Areas not prone to ground settlement/subsidence

Symbols:

- road
- railroad
- river

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 pavements 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 groundwater levels.

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

Areas Susceptible to Ground Settlement:
 Areas where fluvialite sands, silts and clays coupled with shallow groundwater table are sites of possible ground settlement. Ground settlement may be mitigated 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.

Areas not Prone to Ground Settlement/Subsidence:
 Areas where the possibility of ground settlement or ground subsidence is not possible.

Field data collection by: M.R.M. Rint
 Geomorphological Interpretation by: M.R.M. Rint
 GIS processing by: M.R.M. Rint
 Digital cartographic processing by: M.R.M. Rint & B. Malto
 Checked by: A.E. Dayao
 Approved by: R.A. Juan

Other Sources of Information:
 1:50,000 scale NAMRIA Topographic Map