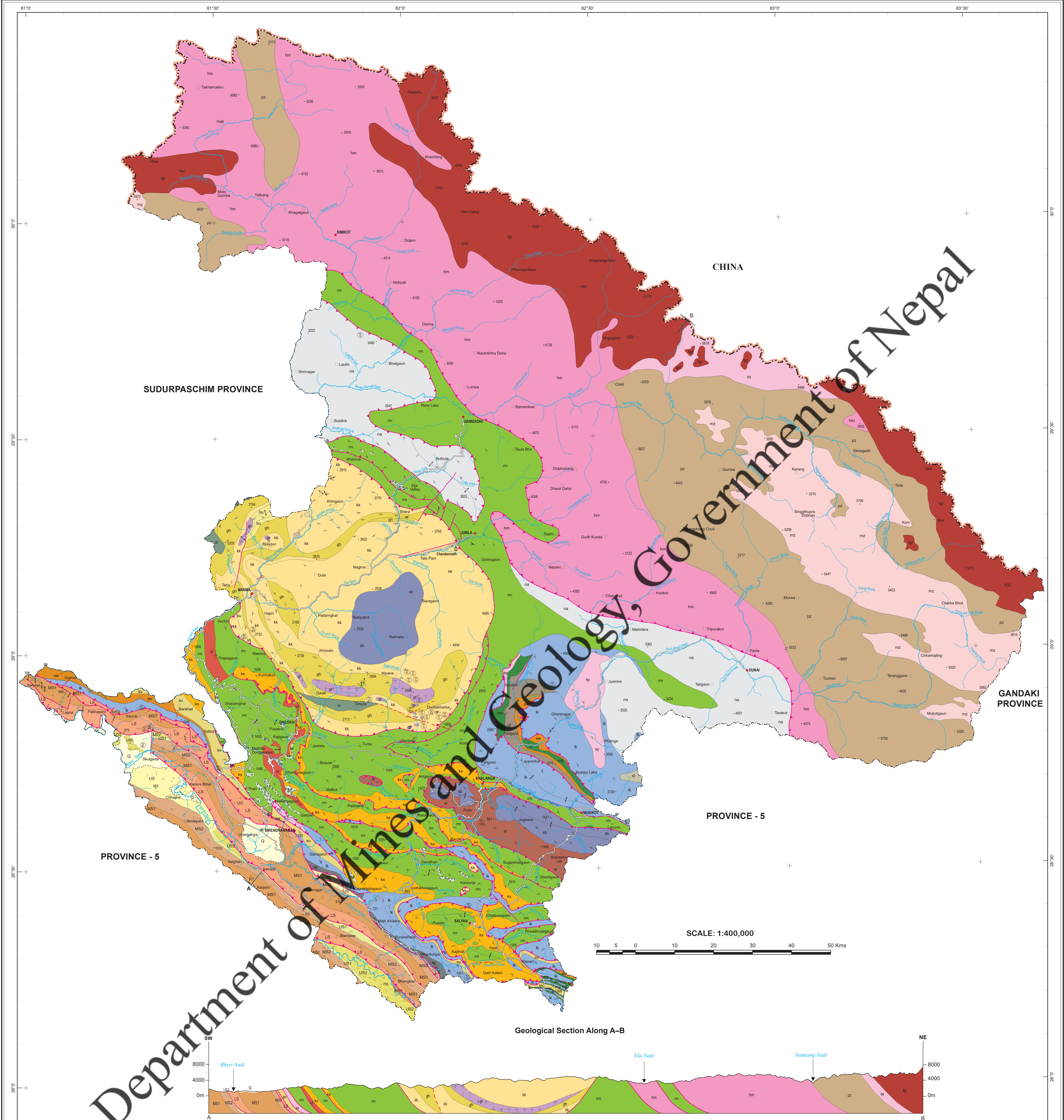
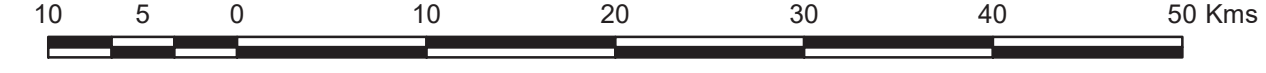


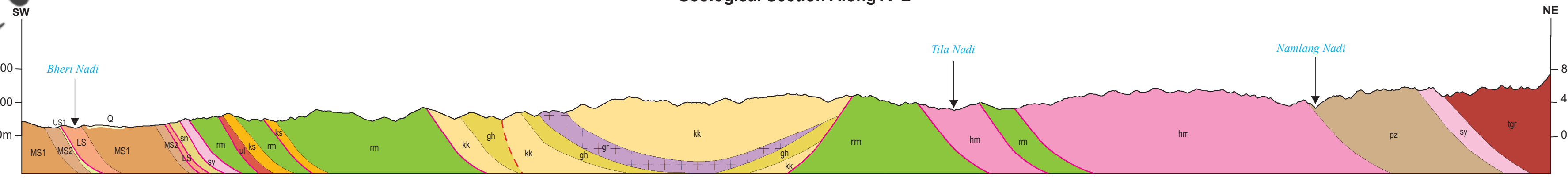
GEOLOGICAL MAP OF KARNALI PROVINCE, NEPAL



SCALE: 1:400,000



Geological Section Along A-B



LEGEND		PHYSIOGRAPHIC FEATURES	
SURFICIAL DEPOSITS (Quaternary - Recent)		District Headquarter	
Q	Quaternary: Alluvium, Boulder, gravel, sand, silt and clay.	Province Headquarter	
SIWALIK GROUP (Middle Miocene - Lower Pleistocene)		Peaks with Height in Meter	
US ₁	Upper Upper Siwalik: Boulder, cobble, conglomerates with minor yellow, grey mud and silt, sand bands and lenses in the conglomerates.	Province Boundary	
US ₂	Lower Upper Siwalik: Pebbly conglomerates, yellow and grey mud with minor grey sands.	International Boundary	
US	Upper Siwalik: Undifferentiated.	Highway, Feeder Road, Other Road	
MS ₁	Upper Middle Siwalik: Medium to coarse-grained sandstones, pebbly sandstone with siltstones and mudstones with relic of hard sandstones. Turtle limb is present in the sandstones.	Stream, River	
MS ₂	Lower Middle Siwalik: Medium, fine to medium grained sandstones with interbeds of siltstones and mudstones. Clay materials and plant fossils are present.	-143 Spot Height in Meter	
LS	Lower Siwalik: Fine grained sandstones with interbeds of purple or red colored mudstones, shales, siltstones and occasional marl.	Temple, Town, Village	
SURKHET GROUP (Cretaceous-Oligocene)		STRUCTURE	
SU	Sunari Formation: Fine to medium grained, greenish grey sandstones and purple shales with intercalations of green siltstone shales.	Geological Contact	
SW	Swat Formation: Grey to dark grey carbonaceous crumpled shales with bands and lenses of fine grained fossiliferous limestone (Murchisonia sp., Asaphus sp., etc) and ferruginous quartzites at the base.	Alluvium Boundary	
MS	Melani Formation: White, grey, ferruginous well bedded massive or the quartzites interbedded with grey carbonaceous crumpled and reddish brown shales and occasional conglomerates and fossiliferous limestones. Osteopores (Phromotrids), Pelecypods (Modiolus, Pteromyia, Homomya) and Undershell.	Thrust	
MID-LAND GROUP (Upper Precambrian-Late Paleozoic)		Fault	
Laksharua Sub-Group		Inferred Contact	
LK	Laksharua Formation: Upper Precambrian, grey limestones and dolomites with thin intercalations of black to grey shales. At places white pink dolomitic limestones, purple and green shales at the top. Aque structure with stromatolites are present.	Unconformity	
SY	Syanja Formation: White to milky white, pale orange, pinkish or purplish calcareous quartzites and dolomitic limestones with dark grey and purple shales and pale green shales at base.	Anticlinal Axis	
SG	Sangram Formation: Black, dark grey to greenish grey silty argillaceous shales with thin intercalations of limestones and white fine grained cross-bedded quartzites at base.	Synclinal Axis	
GF	Galyang Formation: Dark grey shales finely intercalated with thin grey calcareous shales and sandstones. Dark grey to bluish grey fine grained limestones and dolomitic limestones of various sizes within the shales are common. Banded Carbonates: grey siliceous dolomites.	Overturned	
Dalchik Sub-Group		Overturned Anticline	
DM	Dalchik Formation: Grey to greenish grey, gritty chert phyllites and phyllitic quartzites, meta-sandstones and conglomerate beds with white massive quartzites in the upper and lower parts. Basic intrusions are frequent.	Overturned Syncline	
GEOLGY		ATTITUDE OF BEDDING	
KS	Kusma Formation: White to grey, fine to medium grained, massive at places ripple marked quartzites intercalated with green chlorite phyllites.	0°	
UL	Uleri Formation: Augen gneisses and feldspathic schists.	1°-19°	
Eokhara Sub-Group		20°-39°	
SE	Seti Formation: Grey greenish grey gritty chlorite muscovite sandstones with conglomerates and white massive quartzites in the upper part. Basic intrusions are noted.	40°-69°	
JALJALA GROUP (Precambrian)		70°-89°	
SB	Surbang Formation: Grey to brown crystalline limestones interbedded with calcareous schists, calcareous quartzites and biotite-quartz schists.	90°	
SL	Sluti Formation: Graniferous quartz-biotite-schists and muscovite-biotite-schists with calcareous schists, quartzites and rare granitic schists with blasto mylonitic augen gneiss of the base.	Calcite	
DADELHURA GROUP (Precambrian)		Kyanite	
SA	Salyani Gad Formation: Aplites, granite gneisses, augen gneisses and biotite gneisses.	Limestone	
KA	Kalkoti Formation: Garnetiferous biotite-schists and micaceous quartzites with gneisses.	Quartz	
GA	Ghatia Gad Carbonates: Bluish Crystalline limestones, calcareous schists and quartz-biotite schists.	Red Clay	
BU	Budhi Ganga Gneiss: Augen gneisses, granitic gneisses and feldspathic schists.	Tourmaline	
NAWAKOT GROUP		MINES	
NA	Precambrian to Lower Paleozoic: Mainly shallow marine sediments, lower part dominantly clastic (Phyllites, sandstones, quartzites and calcareous sandstones). Stromatolitic limestones and black shales occur in the upper part. Basic sills and dykes are present.	Cobalt	
TIBETAN SEDIMENTARY ZONE		Limestone	
MZ	Mesozoic: Triassic to Lower Cretaceous. Mainly shallow continental platform sediments with local pro-ortho facies in the Early Cretaceous. Sandstones, shales, slates and gneiss. Marly ammonites and bellerophonites in Jurassic Limestones.	Quartz	
PZ	Paleozoic: Cambrian to Permian. Lower part mainly calcareous, middle part pelagic and upper part is rich in detrital sediments. Limestone, sandstone and shale. Early Permian flood beds with plant fossils and fossiliferous lava flows.	Red Clay	
HIGHER HIMALAYAN CRYSTALLINES ZONE		Tourmaline	
HM	Precambrian high grade metamorphic rocks comprising gneisses, quartzites and marbles. Migmatites and granite gneisses present predominantly in the upper part.		
TR	Tertiary (Miocene) Two mica leucocratic granites with tourmaline.		
SYMBOLS			
GR	granites		
BR	Basic rocks		

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Data Sources:
This map is compiled from the published "Geological map of Nepal (1:1,000,000)", "Geological Map of Western Central, Mid Western & Far Western Region of Nepal (1:250,000)" by Department of Mines & Geology (DMG) and "Geological Map of Petroleum Exploration Block no 2 and 3 (1:250,000)" by Petroleum Exploration Promotion Project (PEPP), Nepal.

Topographical Base:
1:25,000 & 1:50,000 Map of GoN, Survey Department, Kathmandu, Nepal

